तत् त्वं पूषन् अपावृणु
केन्द्रीय विद्यालय संगठन

केंद्रीय विद्यालय संगठन

(जम्मू संभाग)

KENDRIYA VIDYALAYA SANGATHAN

(JAMMU REGION)

SAMPLE PAPER FOR CLASS X MATHEMATICS STANDARD (041)

क्षेत्रीय कार्यालय, जम्मू, नज़दीक राजकीय चिकित्सालय, गाँधी नगर
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KENDRIYA VIDYALAYA SANGATHAN, JAMMU REGION

SAMPLE PAPER SET- 1

CLASS – X **SUBJECT- MATHS (STD)**

TIME – 3 HOURS **M.M- 80 MARKS**

General Instructions:

1. This Question Paper has 5 Sections A, B, C, D, and E.

2. Section A has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.

3. Section B has 5 Short Answer-I (SA-I) type questions carrying 2 marks each.

4. Section C has 6 Short Answer-II (SA-II) type questions carrying 3 marks each.

5. Section D has 4 Long Answer (LA) type questions carrying 5 marks each.

6. Section E has 3 Case Based integrated units of assessment (4 marks each) with sub-parts of

the values of 1, 1 and 2 marks each respectively.

7. All Questions are compulsory. However, an internal choice in 2 Qs of 2 marks, 2 Qs of 3 marks

and 2 Questions of 5 marks has been provided. An internal choice has been provided in the 2

marks questions of Section E.

8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

	SECTION A	
	Section A consists of 20 questions of 1 mark each	
sno		Marks
1	Express as a product of prime factors : 216 (a) 2X3X4X4 (b) 2X2X2 X17 (c) 2X2X3X17 (d) none of above	1
2	Find LCM of 45 and 96 (a) 3 (b) 5 (c) none of above	1
3	Find zeros of quadratic polynomial x^2 +x -20 (a) 4,-5 (b) -4,5 (b) -4,-5 (d) none of above	1
4	Graphically, the pair of equations given by 2x+3y = 0 4x +6y+ 9 = 0 represents two lines which are (a) intersecting at exactly one point. (b) parallel. (c) coincident. (d) intersecting at exactly two points.	1
5	Condition for no real roots for a quadratic equation $ax^2+bx+c=0$ is	1

<table>
<tr><td></td><td>(a) b^2 -4ac is greater than 0 (b) b^2-4ac is less than 0
(c) b^2-4ac = 0 (d) all of above</td><td></td></tr>
<tr><td>6</td><td>Find distance between pair of points (2,3) and (4,1)
(a) 5 (b) 25 (c) 7 (d) none of above</td><td>1</td></tr>
<tr><td>7</td><td>All ---------- triangles are similar
(a)isosceles (b) equilateral (c) scalene (d) all of above</td><td>1</td></tr>
<tr><td>8</td><td>A point on x axis is represented by
(i) (x,0) (II) (0,x) (iii) none of above</td><td>1</td></tr>
<tr><td>9</td><td>A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm. Length PQ is :
(A) 12 cm (B) 13 cm (C) 8.5 cm (D) $\sqrt{119}$</td><td>1</td></tr>
<tr><td>10</td><td>If PQR is a right angled triangle ,right angled at Q, find tan P – cot R</td><td>1</td></tr>
<tr><td>11</td><td>$9\sec^2 A - 9\tan^2 A$ =
(a) 1 (b) 9 (c) 8 (d) 0</td><td>1</td></tr>
<tr><td>12</td><td>The value of cos x increases if x
(a) Increases (b) decreases</td><td>1</td></tr>
<tr><td>13</td><td>Tick the correct answer in the following and justify your choice : If the perimeter and the area of a circle are numerically equal, then the radius of the circle is (A) 2 units (B) π units (C) 4 units (D) 7 units</td><td>1</td></tr>
<tr><td>14</td><td>Find the area of a sector of a circle with radius 6 cm if angle of the sector is 60°</td><td>1</td></tr>
<tr><td>15</td><td>A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel.
(a) 572cm2 (b) 752 cm2 (c) none of above</td><td>1</td></tr>
<tr><td>16</td><td>Class mark of a class in frequency distribution is
(a) Upper limit + lower limit /2
(b) Upper limit – lower limit /2
(c) None of above</td><td>1</td></tr>
<tr><td>17</td><td>The table below shows the daily expenditure on food of 25 households in a locality, Find the mean daily expenditure on food by a suitable method.
<table>
<tr><td>Variable)x)</td><td>100 - 150</td><td>150 -200</td><td>200 - 250</td><td>250 -300</td><td>300 -350</td></tr>
<tr><td>Frequency (y)</td><td>4</td><td>5</td><td>12</td><td>2</td><td>2</td></tr>
</table></td><td>1</td></tr>
</table>

	(a) 211 (b) 214 (c) 412 (d) 212	
18	(a) A bag contains lemon flavoured candies only. Malini takes out one candy without looking into the bag. What is the probability that she takes out (i) an orange flavoured candy? (ii) a lemon flavoured candy? (a) 1,0 (b) 0,1 (c) none of above	
	Direction for questions 19 & 20: In question numbers 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.	
19	Assertion: If HCF of 510 and 92 is 2, then the LCM of 510 & 92 is 32460 Reason: as HCF(a,b) x LCM(a,b) = a x b (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A). (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but Reason (R) is true.	1
20	Assertion (A): The ratio in which the line segment joining (2, -3) and (5, 6) internally divided by x axis is 1:2. Reason (R): as formula for the internal division is $(mx2 + nx1)/(m + n),(my2 + ny1)/(m + n)$ (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A). (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but Reason (R) is true.	1
	Section B	
	Section B consists of 5 questions of 2 marks each.	
21	Two rails are represented by the equations x + 2y – 4 = 0 and 2x + 4y – 12 = 0. Represent this situation geometrically	2
22	Using basic proportionality Theorem, prove that a line drawn through the mid-point of one side of a triangle parallel to another side bisects the third side OR The diagonals of a quadrilateral ABCD intersect each other at the point O such that AO/BO=CO/DO, Show that ABCD is a trapezium.	2

23	The length of a tangent from a point A at distance 5 cm from the centre of the circle is 4 cm. Find the radius of the circle.	2
24	In Δ PQR, right-angled at Q, PR + QR = 25 cm and PQ = 5 cm. Determine the values of sin P, cos P and tan P.	2
25	Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.	2
	Section C	
	Section C consists of 6 questions of 3 marks each.	
26	Prove that √3 is an irrational number	3
27	Find the roots of the quadratic equation $3x^2 - 2\sqrt{6}x + 2 = 0$	3
28	The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km, the charge paid is ` 205 and for a journey of 15 km, the charge paid is ` 255. What are the fixed charges and the charge per km? How much does a person have to pay for travelling a distance of 35 km? **OR** The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number. How many such numbers are there?	3
29	The length of a tangent from a point A at distance 5 cm from the centre of the circle is 4 cm. Find the radius of the circle.	3
30	$(1+\sin A)/(1-\sin A) = \sec A + \tan A$ OR $\cos A - \sin A + 1/,\cos A + \sin A - 1 = \operatorname{cosec} A + \cot A$	3
31	(i) A lot of 25 bulbs contain 5 defective ones. One bulb is drawn at random from the lot. What is the probability that this bulb is defective? (ii) Suppose the bulb drawn in (i) is not defective and is not replaced. Now one bulb is drawn at random from the rest. What is the probability that this bulb is not defective ?	3
	Section D	
	Section D consists of 4 questions of 5 marks each.	
32	In a class test, the sum of Shefali's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in the two subjects. **OR** Sum of the areas of two squares is 468 m2 . If the difference of their perimeters is 24 m, find the sides of the two squares.	5
33	State and prove basic proportionality theorem Also find EC in triangle ABC where DE is parallel to BC and AD=1.5cm,BD = 3cm ,AE = 1cm	5

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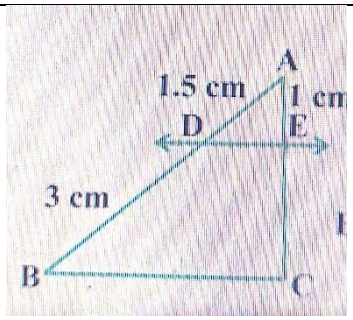
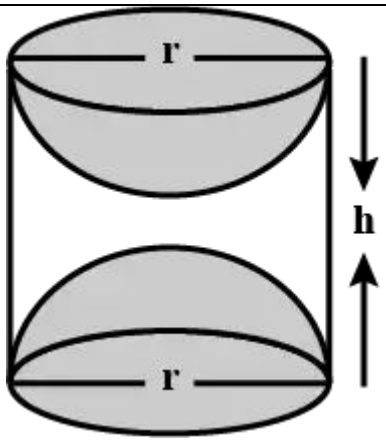
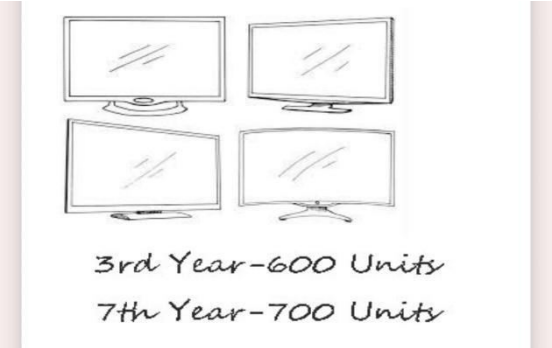
<tr><td></td><td> 
</td><td></td></tr>
<tr><td>34</td><td> 

A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in fig If the height of the cylinder is 10 cm, and its base is of radius 3.5 cm, find the total surface area of the article.
OR
From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2.</td><td>5</td></tr>
<tr><td>35</td><td>Thirty women were examined in a hospital by a doctor and the number of heartbeats per minute were recorded and summarised as follows. Find the mean ,mode and median of heart beats per minute for these women, choosing a suitable method.
<table>
<tr><td>Number of heart beats per minute</td><td>65-68</td><td>68-71</td><td>71- 74</td><td>74-77</td><td>77-80</td><td>80-83</td><td>83-8</td></tr>
<tr><td>Number of women</td><td>2</td><td>4</td><td>3</td><td>8</td><td>7</td><td>4</td><td>2</td></tr>
</table></td><td>5</td></tr>
<tr><td></td><td>Section E</td><td></td></tr>
<tr><td></td><td>Case study based questions are compulsory.</td><td></td></tr>
<tr><td></td><td>Case study -1</td><td></td></tr>
</table>

36



During the summers of 2003 ,Manisha thought of starting some business of her own and lent some money from her father and started a tv manufacturing company. After some years ,she was known as one of the leading manufacturers in her area and kept expanding her limit year by year. Assuming that the production increases uniformly year by year,the number of TV sets produced by her in the third year was 600 units and in seventh year it was 700

Qno	question	marks
1	What was the production in first year	1
2	What was the production in tenth year	1
3	What is the total production till seven years	2

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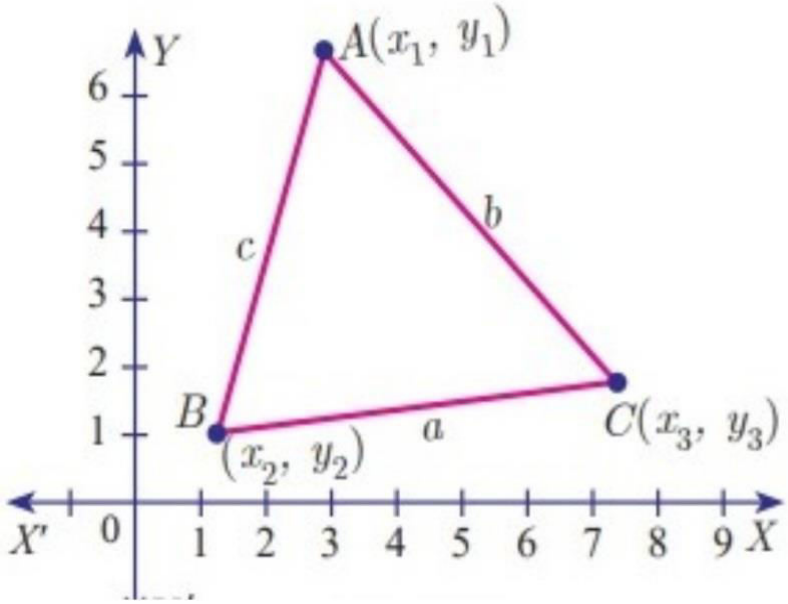
Case Study – 2

A piece of sandwich lies on the coordinate plane as shown in figure below

A,B and C point denotes the edges of the sandwich. Refer and answer the questions

Q1. Locate Point A

Q2. Find the point which is equidistant from A and B

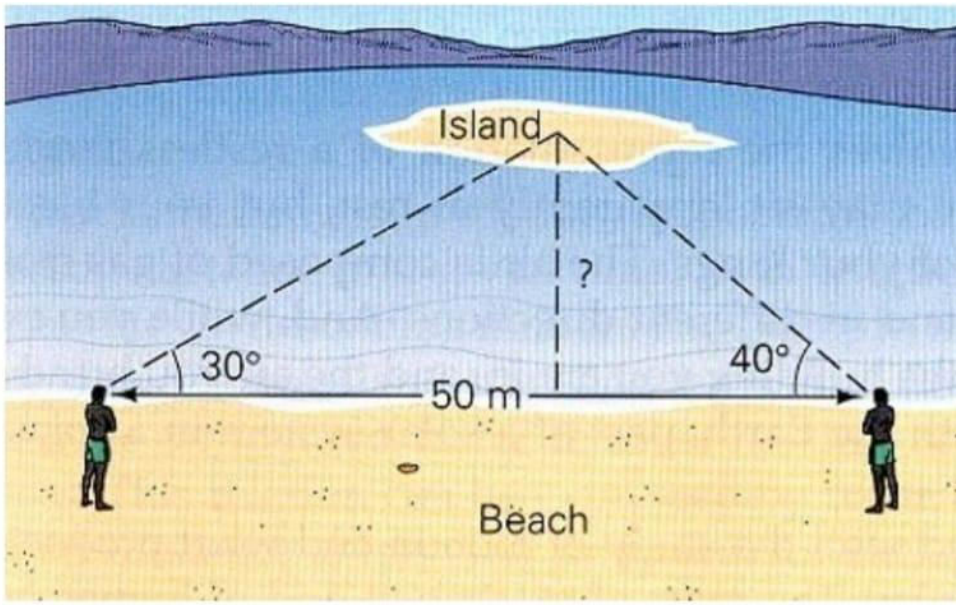


Q3 Using distance formula find distance

Based on the above information answer the following questions using the c

		1
		1
		2

38 **case study --3**



Mohan and sohan went on a vacation to a seaside. They spotted an island at a certain distance from the sea shore .The two friends planned to standat a distance of 50m from each other such that the angle of elevation of mohan from island is 30^0 while that from sohan is 40^0as shown in figure above.
Use √3=1.732
Based on the above information answer the following questions

1	What is value of unknown angle of the triangle whose vertices are Mohan,Sohan and island?	1
2	What is distance of the island from Mohan from the point where he is standing ?	1
3	What is the distance of the island from Sohan from the point	2

		where he is standing ? (take cos 40^0=0.766			

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SAMPLE PAPER SET-2

CLASS-X **SUBJECT- MATH (Std)**

TIME: 3 HOURS **M.M- 80**

GeneralInstructions:

1. ThisQuestionPaperhas5SectionsA-E.
2. Section**A**has 20MCQscarrying1markeach
3. Section**B**has 5questionscarrying02markseach.
4. Section**C**has 6questionscarrying03markseach.
5. Section**D**has 4questionscarrying05markseach.
6. Section **E** has 3 case based integrated units of assessment (04 marks each) with sub-partsofthe values of 1, 1and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs
   of 3 marks and 2 Questions of 2 marks has been provided. An internal choice hasbeenprovided in the 2marks questions of Section E
8. Drawneatfigureswhereverrequired.Takeπ=22/7whereverrequiredifnotstate d.

SECTION A
SectionAconsistsof20questionsof 1markeach.
1. If two positive integers p and q can be expressed as p = ab^2 and q = ab^3 ; where a, b being prime numbers, then LCM (p q) is equal to (a) ab (b) a^2b^2 (c) a^3b^2 (d) a^3b^3
2. If $\sqrt{x+10} - \frac{6}{\sqrt{x+10}} = 5$, then extraneous root of this equation is (a) 26 (b) -9 (c) -26 (d) 9
3. Ifαand βarethezeros of apolynomial f(x) =x^2– x– 4, then the value of $\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta$ is (a) $\frac{15}{4}$ (b)$-\frac{15}{4}$(c) 4 (d) 15
4. The pair of linear equations 2kx+5y=7, 6x-5y=11 has a unique solution, if (a) k≠-3 (b) k≠ $\frac{2}{3}$ (c) k≠ 5 (d) k≠ $\frac{2}{9}$
5. If b = 3, then any integer can be expressed as a = (a) 3q, 3q+ 1, 3q + 2 (b) 3q (c)none of these (d) 3q+1

6. Two poles of height 6 m and 11 m stand vertically upright on a plane ground. If the distance between their foot is 12 m, then distance between their tops is

(a) 11m (b) 12m (c) 13m (d) 14m

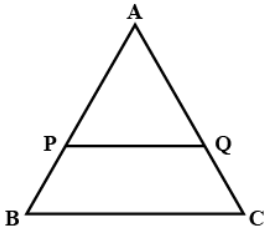
7. If $\cos(\alpha + \beta) = 0$, then $\sin(\alpha - \beta)$ can be reduced to

(a) $\cos\beta$ (b) $\cos 2\beta$ (c) $\sin\alpha$ (d) $\sin 2\alpha$

8. If $\sin\theta - \cos\theta = 0$, then the value of $(\sin^4\theta + \cos^4)$ is

(a) 1 (b) $\frac{3}{4}$ (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

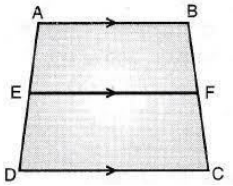
9. In the given figure, P and Q are points on the sides AB and AC respectively of a triangle ABC. PQ is parallel to BC and divides the triangle ABC into 2 parts, equal in area. The ratio of PA**:**AB =



(a) 1:1 (b) $\left(\sqrt{2}-1\right) : \sqrt{2}$

(c) $1:\sqrt{2}$ (d) $\left(\sqrt{2}-1\right) : 1$

10. In the given figure, if ABCD is a trapezium in which $AB \parallel CD \parallel EF$, then $\frac{AE}{ED} =$



(a) $\frac{2FC}{BF}$ (b) $\frac{2BF}{FC}$ (c) $\frac{FC}{BF}$ (d) $\frac{BF}{FC}$

11. If the equation of a circle is $(4a-3)x^2 + ay^2 + 6x - 2y + 2 = 0$, then its centre is

(a) (3,-1) (b) (3, 1) (c) (-3,-1) (d) None of these

12. Two concentric circles are of radii 10 cm and 6 cm, then the length of the chord of the larger circle which touches the smaller circle is:

(a) 16 cm (b) 12 cm (c) 18 cm (d) 9 cm

13. A cylinder, a cone and a hemisphere are of equal base and have the same height. What is the ratio of their volumes?

(a) 3:1:2 (b) 3:2:1 (c) 1:2:3 (d) 1:3:2

14. D and E are respectively the midpoints on the sides AB and AC of a triangle ABC and BC = 6 cm. If DE ‖ BC, then the length of DE (in cm) is

(a) 2.5 (b) 3 (c) 5 (d) 6

15. It is proposed to build a single circular park equal in area to the sum of areas of two circular parks of diameters 16 m and 12 m in a locality. The radius of the new park would be

(a) 10 m (b) 15 m (c) 20 m (d) 24 m

16. Mean of 100 items is 49. It was discovered that three items should have been 60, 70, 80 were wrong read as 40, 20, 50 respectively. The correct mean is
(a) 48 (b) 49 (c) 50 (d) 60

17. Two unbaised coins are tossed simultaneously then the probability of getting no head is $\frac{A}{B}$, then $(A+B)^2$ is equal to
(a) 1 (b) 4 (c) 5 (d) 25

18. If $0<\theta<\frac{\pi}{4}$ then, the simplest form of $\sqrt{1-2sin\theta cos\theta}$ *is*
(a) $\sin\theta - \cos\theta$ (b) $\cos\theta - \sin\theta$
(c)$\cos\theta + sin\theta$ (d) $\sin\theta cos\theta$

19. ***Statement A (Assertion)*: *If 5 divides k^2*** then 5 also divides k, where k is a positive integer
Statement R(Reason) **:** Let p be a prime number, if p divides a^2, then p divides a, where a is a positive integer.
(a) Both assertion(A)and reason(R) are true and reason(R)is the correct explanation of assertion (A)
(b) Both assertion(A) andreason(R) are true and reason(R)is not the correct explanation of assertion (A)
(c) Assertion(A)istrue butreason(R)isfalse.
(d) Assertion(A)isfalse butreason(R)istrue.

20. ***Statement A (Assertion)*** **:** The value of y is 6, for which the distance between the points P(2,-3) and Q(10, y) is 10.
StatementR(Reason) **:** Distance between two given points A$(x_1 y_1)$ and B$(x_2 y_2)$ is given,
AB= $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$
(a) Bothassertion(A)andreason(R) aretrueandreason(R)isthe correctexplanationofassertion (A)
(b) Both assertion(A) andreason(R) aretrueandreason(R)isnotthecorrectexplanationofassertion (A)
(c) Assertion(A)istrue butreason(R)isfalse.
(d) Assertion(A)isfalse butreason(R)istrue.

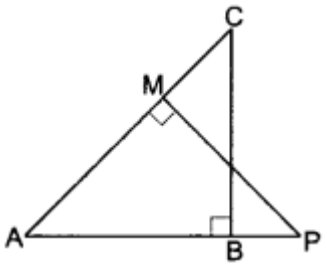
SECTION B

Section B consists of 5 questions of 2 marks each.

21. Find the values of 'a' and 'b' for which the following system of linear equations has infinite number of solutions. 2x + 3y = 7, (a + b + 1) x +(a + 2b + 2) y = 4 (a + b) +1

22. In given Fig., ABC and AMP are two right triangles right-angled at B and M respectively. Prove that:
(i) ΔABC ~ ΔAMP

(ii) $\frac{CA}{PA} = \frac{BC}{MP}$

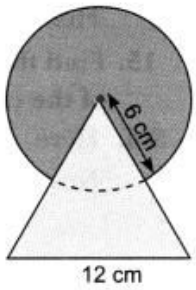


23. From an external point P, tangents PA and PB are drawn to a circle with centre O. If ∠PAB = 50°, then find ∠AOB.

24. The minute hand of a clock is 10 cm long. Find the area of the face of the clock described by the minute hand between 9 AM and 9.35 AM.

OR

Find the area of the shaded region in Fig, where a circular arc of radius 6 cm has been drawn with vertex 0 of an equilateral triangle OAB of side 12 cm as centre.



25. If sin θ = $\frac{12}{13}$, 0°< θ < 90°, find the value of: $\frac{sin^2\theta - cos^2\theta}{2sin\theta.cos\theta} \times \frac{1}{tan^2\theta}$

OR

If tanθ = $\frac{12}{5}$, find the value $\frac{1+sin\theta}{1-sin\theta}$.

SECTION C

Section C consists of 6 questions of 3 marks each.

26. Prove that $2+5\sqrt{3}$ is an irrational number, given that $\sqrt{3}$ is an irrational number.

27. If α and β are the zeroes of a quadratic polynomial such that α + β = 24 and α - β=8. Find the quadratic polynomial having α and β as its zeroes.

28. A train covered a certain distance at a uniform speed. If the train would have been 10 km/hr scheduled time. And, if the train were slower by 10 km/hr, it would have taken 3 hr more than the scheduled time. Find the distance covered by the train.

OR

In an election contested between A and B, A obtained votes equal to twice

the no. of persons on the electoral roll who did not cast their votes and this later number was equal to twice his majority over B. If there were 1,8000 persons on the electoral roll. How many votes for B

29. Prove that $\frac{sin\theta - 2\sin^3\theta}{2\cos^3\theta - cos\theta} = tan\theta$

30. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

OR

In two concentric circles , prove that all chords of the outer circle which touch the inner arc of equal length.

31. Three different coins are tossed together. Find the probability of getting

(i) exactly two heads

(ii) at least two heads

(iii) at least two tails

SECTION D

Section D consists of 4 questions of 5 marks each.

32. A cyclist, after riding a certain distance, stopped for half an hour to repair his bicycle, after which he completes the whole journey of 30 km at half speed in 5 hours. If the breakdown had occurred 10 km farther off, he would have done the whole journey in 4 hours. Find where the breakdown occurred and his original speed.

33. Prove that three times the sum of the squares of the sides of a triangle is equal to four times the sum of the squares of the medians of the triangle.

34. A milk tanker cylindrical in shape having diameter 2 m and length 4.2 m supplies milk to the two booths in the ratio of 3:2 . One of the milk booths has cuboidal vessel having base area 3.96 sq. m. and the other has a cylindrical vessel having radius 1 m. Find the level of milk in each of the vessels. Use $\pi = \frac{22}{7}$.

OR

A hemispherical tank, of diameter 3 m, is full of water. It is being emptied by a pipe at the rate of $3\frac{4}{7}$ litre per second. How much time will it take to make the tank half empty? Use $\pi = \frac{22}{7}$.

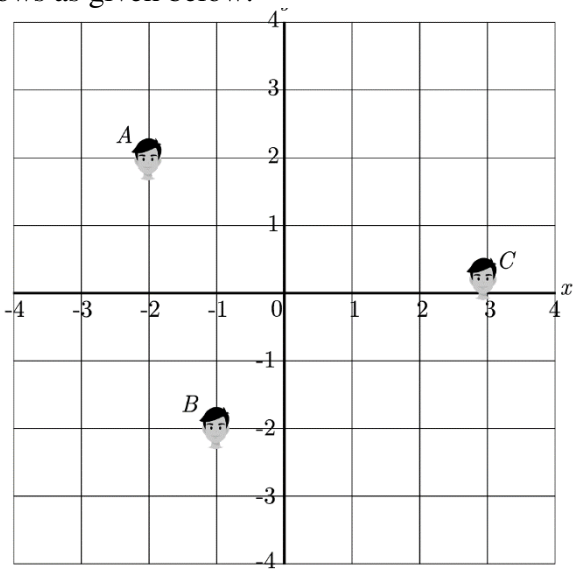
35. If the mean of the following frequency distribution is 91, and sum of frequency is 150, find the missing frequency x and y :

Class	0- 30	30-60	60-90	90-120	120-150	150-180
Frequency	12	21	x	52	y	11

SECTION E

Case study based questions are compulsory.

36. Morning assembly is an integral part of the school's schedule. Almost all the schools conduct morning assemblies which include prayers, information of latest happenings, inspiring thoughts, speech, national anthem, etc. A good school is always particular about their morning assembly schedule. Morning assembly is important for a child's development. It is essential to understand that morning assembly is not just about standing in long queues and singing prayers or national anthem, but it's something beyond just prayers. All the activities carried out in morning assembly by the school staff and students have a great influence in every point of life. The positive effects of attending school assemblies can be felt throughout life. Have you noticed that in school assembly you always stand in row and column and this make a coordinate system. Suppose a school have 100 students and they all assemble in prayer in 10 rows as given below.



(i) What are the coordinates of point A?
(ii) What is the distance of point A from origin? |
(iii) What is the distance between A and B?
(iv) What is the distance between B and C?
OR
(v) A point D lies on the line segment between points A and B such that AD:DB = 4:3 . What are the the coordinates of point D?

37. Road Roller : A road roller (sometimes called a rollercompactor, or just roller) is a compactor-type engineering vehicle used to compact soil, gravel, concrete, or asphalt in the construction of roads and foundations. Similar rollers are used also at landfills or in agriculture. Road rollers are frequently referred to as steamrollers, regardless of their method of propulsion.

RCB Machine Pvt Ltd started making road roller 10 year ago. Company increased its production uniformly by fixed number every year. The company produces 800 roller in the 6th year and 1130 roller in the 9th year.

(i) What was the company's production in first year?

(ii) What was the company's production in the 8th year?

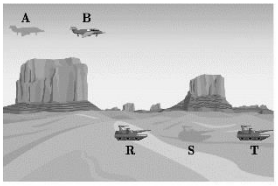
(iii) What was the company's total production of the first 6 years?

(iv) What was the increase in the company's production every year?

OR

(v) In which year the company's production was 1350 rollers?

38. An air-to-surface missile (ASM) or air-to-ground missile (AGM or ATGM) is a missile designed to be launched from military aircraft and strike ground targets on land, at sea, or both. They are similar to guided glide bombs but to be deemed a missile



A military fighter plane is flying at an altitude of 600 metres with the speed of 200 km/h. The pilot spots enemy tanks at point R on ground. After getting the permission from command centre to hit the target at R, pilot fires a missile. Fighter plane was at point A at the time of fire of missile. Missile moves to target at enemy tanks stationed at R at an angle of 45° at a speed of 300 km/h.

(i) What is the horizontal distance between fighter plane at A and tank at R?

(ii) How much time will missile take to hit the target R?

(iii) Another enemy tank at point S on ground moving with a speed of 90 km/h in straight line away from plane. Pilot fires another missile at an angle of 60° from its flight path position B at the instant when enemy's tank was at S and it hits this enemy tank at point T. How much time is taken by second missile to hit the enemy tank at point T?

(iv) What is the horizontal distance between fighter plane at B and tank at T?

OR

(v) What is the distance of point T from S ?

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SAMPLE PAPER SET- 3

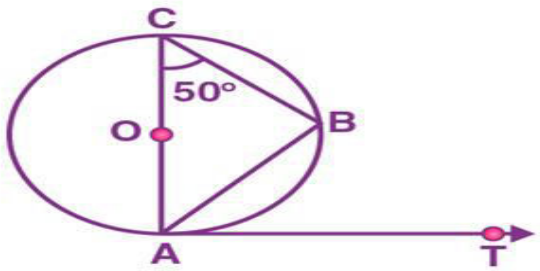
CLASS – X **SUBJECT- MATHS (STD)**

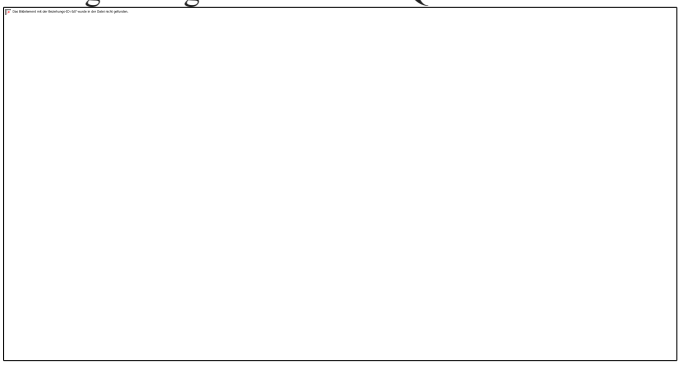
TIME – 3 HOURS **M.M- 80 MARKS**

Read the instructions carefully:

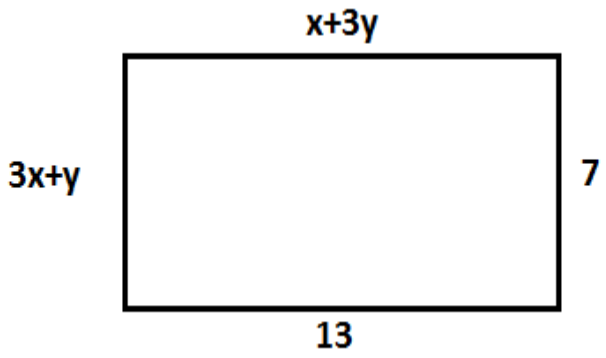
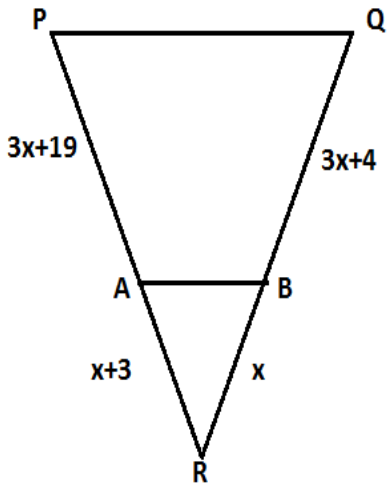
1. This Question Paper has 5 Sections A, B, C, D, and E.
2. Section A has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.
3. Section B has 5 Short Answer-I (SA-I) type questions carrying 2 marks each.
4. Section C has 6 Short Answer-II (SA-II) type questions carrying 3 marks each.
5. Section D has 4 Long Answer (LA) type questions carrying 5 marks each.
6. Section E has 3 Case Based integrated units of assessment (4 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 2 marks, 2 Qs of 3 marks and 2 Questions of 5 marks has been provided.

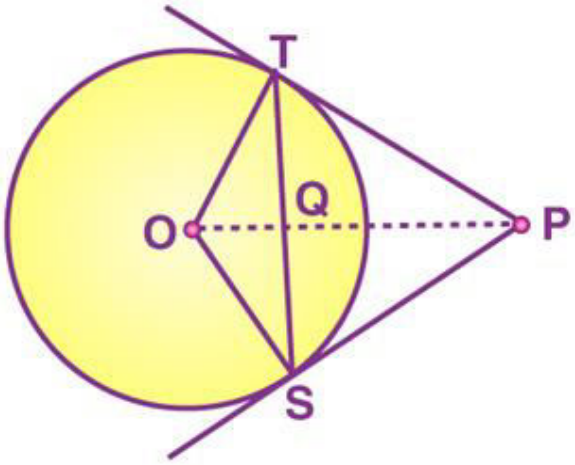
<table>
<tr><td></td><td>SECTION – A</td><td></td></tr>
<tr><td>Q1.</td><td>The mode and mean is given by 7 and 8, respectively. Then the median is:
(a) 1/13
(b) 13/3
(c) 23/3
(d) 33</td><td></td></tr>
<tr><td>Q2.</td><td>Consider the following frequency distribution of the heights of 60 students of a class:
<table><tr><td>Height (in cm)</td><td>150 – 155</td><td>155 – 160</td><td>160 – 165</td><td>165 – 170</td><td>170 – 175</td><td>175 – 180</td></tr><tr><td>Number of students</td><td>15</td><td>13</td><td>10</td><td>8</td><td>9</td><td>5</td></tr></table>The sum of the lower limit of the modal class and upper limit of the median class is
(a) 310
(b) 315
(c) 320
(c) 330</td><td></td></tr>
<tr><td>Q3.</td><td>Which of the following is not irrational?
(a) $(3 + \sqrt{7})$
(b) $(3 – \sqrt{7})$
(c) $(3 + \sqrt{7})\ (3 – \sqrt{7})$
(d) $3\sqrt{7}$</td><td></td></tr>
<tr><td>Q4.</td><td>The probability of an event is always
(a) $0 \leq P(E) \leq 1$</td><td></td></tr>
</table>

	(b) $0 \leq P(E) \geq 1$ (c) $0 < P(E) < 1$ (d) none of these	
Q5.	If the HCF of 65 and 117 is expressible in the form 65m – 117, then the value of m is (a) 4 (b) 2 (c) 1 (d) 3	
Q6.	A cylindrical pencil sharpened at one edge is the combination of (a) a cone and a cylinder (b) two cylinders (c) a hemisphere and a cylinder (d) none of these	
Q7.	The largest number that divides 70 and 125, which leaves the remainders 5 and 8, is: (a) 65 (b) 15 (c) 13 (d) 25	
Q8.	The area of a quadrant of a circle with circumference of 22 cm is (a) 77 cm^2 (b) 77/8 cm^2 (b) 35.5 cm^2 (c) 77/2 cm^2	
Q9.	AB is a chord of the circle and AOC is its diameter such that angle ACB = 50°. If AT is the tangent to the circle at the point A, then BAT is equal to  (a) 65° (b) 60° (c) 50° (d) 40°	
Q10.	In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. The length of	

	the arc is; (a) 20cm (b) 21cm (c) 22cm (d) 25cm	
Q11.	A quadratic polynomial, whose zeroes are –3 and 4, is (a) $x^2 – x + 12$ (b) $x^2 + x + 12$ (c) $(x^2/2) – (x/2) – 6$ (d) $2x^2 + 2x – 24$	
Q12.	If the angle between two radii of a circle is 110º, then the angle between the tangents at the ends of the radii is: (a) 90º (b) 50º (c) 70º (c) 40º	
Q13.	If one equation of a pair of dependent linear equations is -3x+5y-2=0. The second equation will be: (a) -6x+10y-4=0 (b) 6x-10y-4=0 (c) 6x+10y-4=0 (d) -6x+10y+4=0	
Q14.	In the given figure ΔABC ~ ΔPQR. The value of x is  (a) 2.5 cm (b) 3.5 cm (c) 2.75 cm (d) 3 cm	
Q15.	If cos X = ⅔ then tan X is equal to: (a) 5/2 (b) √(5/2) (c) √5/2 (d) 2/√5	

Q16.	The quadratic equation $x^2 + 7x - 60$ has (a) two equal roots (b) two real and unequal roots (b) no real roots (c) two equal complex roots	
Q17.	The midpoint of a line segment joining two points A(2, 4) and B(-2, -4) is (a) (-2, 4) (b) (2, -4) (c) (0, 0) (d) (-2, -4)	
Q18.	(Sin 30°+cos 60°)-(sin 60° + cos 30°) is equal to: (a) 0 (b) $1+2\sqrt{3}$ (c) $1-\sqrt{3}$ (d) $1+\sqrt{3}$	
	Assertion & Reasoning (Q19 and 20) DIRECTION : In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as: (a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A). (b)Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A). (c)Assertion (A) is true but reason (R) is false. (d)Assertion (A) is false but reason (R) is true	
Q19.	Assertion: The point which divides the line joining the points A(1, 2) and B(- 1, 1) internally in the ratio 1: 2 is (−1 2 , 5 3) Reason: The coordinates of the point P(x, y) which divides the line segment joining the points A(x_1 , y_1) and B(x_2 , y_2) in the ratio m : n is $\left(\frac{mx_2+nx_1}{m+n} , \frac{my_2+ny_1}{m+n}\right)$	
Q20.	Assertion: In a right ΔABC, right-angled at B, if $\tan A = \frac{12}{5}$, then $\sec A = \frac{13}{5}$. Reason :CotA is the product of Cot and A.	
	SECTION –B	
Q21.	Find the value(s) of k so that the pair of equations $3x - y - 5 = 0$ and $6x - 2y - p = 0$ are parallel. OR Find the values of x and y in the following rectangle:	

		
Q22.	If $2\sin^2 A - \cos^2 A = 2$, then fin the value of A.	
Q23.	Prove that the tangents drawn to a circle from an external point are equal.	
Q24.	Find the value of x for which AB‖PQ in given figure. 	
Q25.	A cow is tied with a rope of length 14 m at the corner of a rectangular field of dimensions 20m x 16 m. Find the area of the field in which the cow cannot graze. OR Find the area of the minor segment of a circle of radius 21 cm, when the angle of the corresponding sector is 60°.(Use $\sqrt{3}$ =1.73)	
	SECTION –C	
Q26.	Prove that $5 + 2\sqrt{3}$ is irrational.	
Q27.	Find the roots of the following equations: $\frac{1}{2x-3} + \frac{1}{x-5} = 1$,x is not equal to3/2 , 5	
Q28.	If a card is drawn from a well shuffled deck of 52 cards,Find the probability of getting: (a)an Ace of red colour (b)a 10 of club (c)a face card of spade. OR	

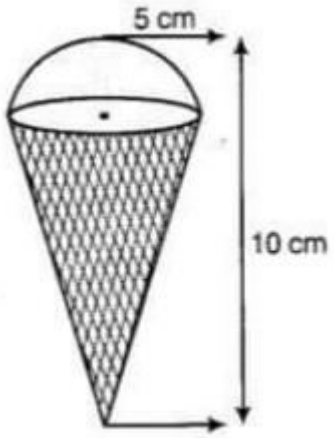
	The probability of selecting a blue marble at random from a jar that contains only blue, black and green marbles is 1/5. The probability of selecting a black marble at random from the same jar is 1/4. If the jar contains 11 green marbles, find the total number of marbles in the jar.	
Q29.	Find the zeroes of the following polynomials by factorisation method and verify the relations between the zeroes and the coefficients of the polynomials: $3x^2 – x – 4$ OR If a and b are zeroes of the quadratic polynomial $x^2 – 6x + a$. Find the value of 'a' if $3\alpha + 2\beta = 20$.	
Q30	If $x = p \sec\theta + q \tan\theta$ and $y = p \tan\theta + q \sec\theta$, then prove that $x^2 – y^2 = p^2 – q^2$.	
Q31.	In the figure, from an external point P, two tangents PT and PS are drawn to a circle with centre O and radius r. If OP = 2r, show that ∠OTS = ∠OST = 30°.  	
	SECTION – D	
Q32.	State and prove Thales theorem.	
Q33.	The mean of the following frequency distribution is 50 but the frequencies f_1 and f_2 in classes 20-40 and 60-80, respectively are not known. Find these frequencies, if the sum of all the frequencies is 120.	

CI	0-20	20-40	40-60	60-80	80-100
f	17	f_1	32	f_2	19

OR

The median of the following data is 50. Find the values of p and q, if the sum of all the frequencies is 90.

CI	F
20-30	P
30-40	15
40-50	25
50-60	20
60-70	Q

		70-80	8	
		80-90	10	
Q34.	In a flight of 600 km, an aircraft was slowed due to bad weather. Its average speed for the trip was reduced by 200 km/hr and the time of flight increased by 30 minutes. Find the original duration of the flight.			
Q35.	An ice-cream cone full of ice-cream having radius 5 cm and height 10 cm as shown in figure .Calculate the volume of ice-cream, provided that its 1/6 part is left unfilled with ice-cream  OR A rocket is in the form of a right circular cylinder closed at the lower end and surmounted by a cone with the same radius as that of the cylinder. The diameter and height of the cylinder are 6 cm and 12 cm, respectively. If the slant height of the conical portion is 5 cm, then find the total surface area of the rocket, (use $\pi = 3.14$)			
	SECTION – E			
Q36.	POLLUTION-A MAJOR PROBLEM: One of the major problem that the world is facing today is the environmental pollution. Common types of pollution include light,noise,water and air pollution.			

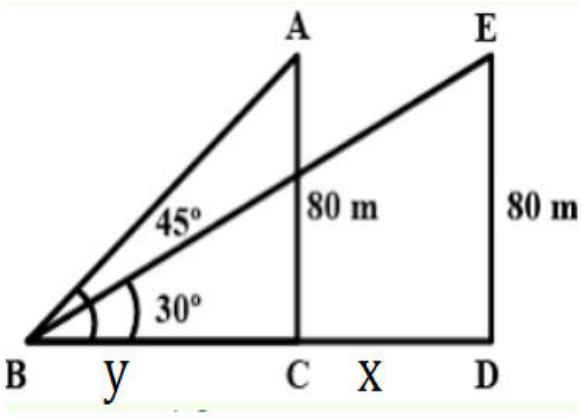
In a school,students thoughts of planting trees in and around the school to reduce pollution.it was decided that the number of trees that each section of each class will plant be the double of the class in which they are studying,e.g.a section of class I will plant 2 trees,a section of class II will plant 4 trees and so on a section of class XII will plant 24 trees.

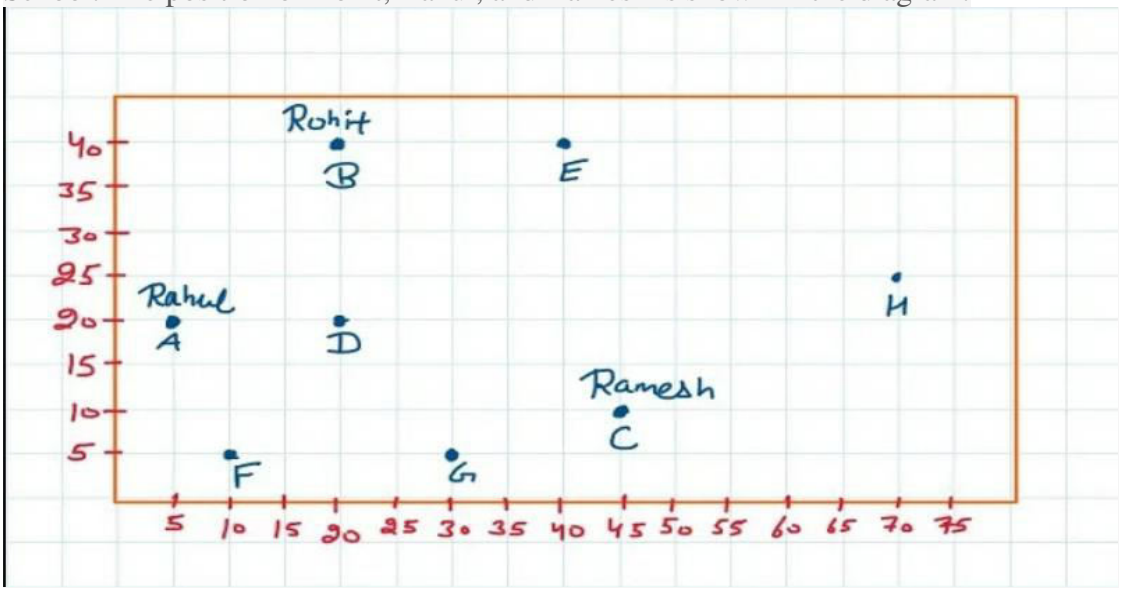
(a)If there are two sections of each class ,how many trees will be planted by class VII students.

(b)Find the AP formed ,if there are three sections of each class.

(c)Find the total number of plants planted by students ,if each class is having only one section.

Q37. A School trip was organized to a bird sanctuary,a boy observed the following situation.



	A bird is sitting on the top of a tree, which is 80 m high. The angle of elevation of the bird, from a point on the ground is 45^{o}. The bird flies away from the point of observation horizontally and remains at a constant height. After 5 seconds, the angle of elevation of the bird from the point of observation becomes 30^{o}, (Take $\sqrt{3}=1.73$). (a)Find the value of x+y . (b) Find the value of x. (c)Find the speed of the bird,when it flies from point C to D	
Q38.	Football is the most popular game in the world. It combines strength, speed, and skills. Football is the most-watched and most played sport on the earth. In Canada and America, it is called Soccer. Football was invented in China nearly 476 BC. It is a 90 minutes long game and those 90 minutes are distributed in two 45 minutes halves.  Three friends Rohit, Rahul, and Ramesh decide to play Football in a playground of the School. The position of Rohit, Rahul, and Ramesh is shown in the diagram.  (a) What is the Co-ordinate of Ramesh's position on the field? (b) The distance between Rahul and Ramesh position is: (c)If Rahul takes Football to position E and Rohit comes at position G then find the distance between them	

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SAMPLE PAPER SET-4

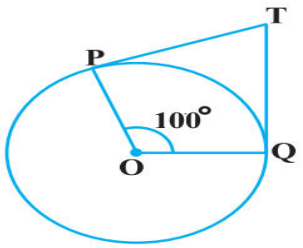
CLASS-X **SUBJECT- MATH (Std)**

TIME: 3 HOURS **M.M- 80**

Maximum Marks: 80 General Instructions:

1. This Question Paper has 5 Sections **A-E.**
2. Section **A** has 20 MCQs carrying 1 mark each
3. Section **B** has 5 questions carrying 02 marks each.
4. Section **C** has 6 questions carrying 03 marks each.
5. Section **D** has 4 questions carrying 05 marks each.
6. Section **E** has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

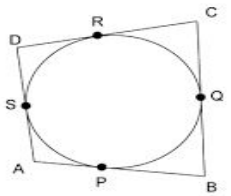
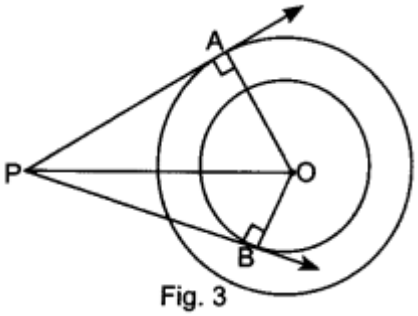
	SECTION A	
S.No.	**Section A consist of 20 questions of 1 mark each.**	**Marks**
1	If HCF (a, b) = 12 and a × b = 1800 then LCM (a, b) is (a) 3600 (b) 900 (c) 150 (d) 90	**1**
2	The pair of equations 3x – 5y = 7 and – 6x + 10y = 7 have (a) a unique solution (b) infinitely many solutions (c) no solution (d) two solutions	**1**
3	The mid-point of the line segment joining the points A (–2, 8) and B (– 6, – 4) is (A) (– 4, – 6) (B) (2, 6) (C) (– 4, 2) (D) (4, 2)	**1**
4	The points A (9, 0), B (9, 6), C (–9, 6) and D (–9, 0) are the vertices of a (A) Square (B) Rectangle (C) Rhombus (D) Trapezium	**1**
5	Given 15 Cot A = 8, then Sin A = (a) $\frac{3}{5}$ (b) $\frac{4}{3}$ (c) 1 (d) None of these	**1**
6	If ΔABC is right angled at B, then the value of Tan A= 1, then the value of 2 sinACosA = (a) 0 (b) 1 (c) $\frac{1}{2}$ (d) Not defined	**1**
7	Sin A = cos A is true when A = (a)0^0 (b) 30^0 (c) 45^0 (d)None of the above	
8	If TP and TQ are tangents to the circle with centre O and $\angle POQ = 100^0$, then what will be the value of $\angle PTQ$.	**1**

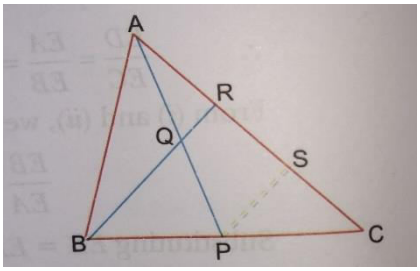
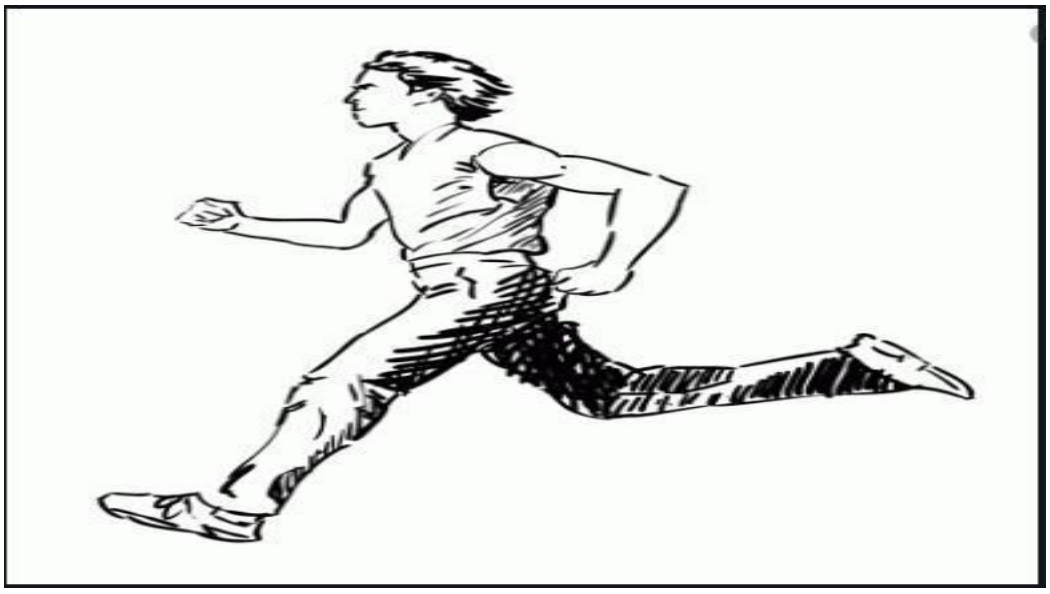
	 (a) 60^0 (b) 70^0 (c) 80^0 (d) 90^0	
9	The common point of the tangent and the circle is called _____. (a) Centre of the circle (b) Circumference (c) Point of contact (d) None of the above	**1**
10	If ΔABC ~ ΔRPQ, AB = 3cm, BC = 5cm, AC = 6cm, RP = 6cm and PQ = 10cm, then what is value of QR. (a) 11cm (b) 12cm (c) 15cm (d) None of these	**1**
11	Find a relation between x and y such that the point (x, y) is equidistant from the point (3,6) and (-3, 4).	**1**
12	Ramu is 6 feet tall. At an instant his shadow is 5 feet long. At the same instant the shadow of a pole is 30feet long. How tall is the pole. (a) 12 feet (b) 24 feet (c) 30feet (d) 36 feet	**1**
13	The area of the circle that can be inscribed in a square of side 6cm is: (a) $36\pi cm^2$ (b) $18\pi cm^2$ (c)$12\pi cm^2$ (d) $9\pi cm^2$	**1**
13	If the area of a semi-circular field is $15400m^2$,then perimeter of the field is: (a)160 √2m (b) 260 √2m (c) 360√2m (d) 460√2m .	**1**
14	The curved surface area of a right circular cone is 12320 cm sq. If its radius is 56 cm, find its slant height a) 35 cm b) 70 cm c) 55 cm d) 35/2 cm	**1**
15	Find mode using empirical formula when mean and median are 10.5 and 9.6 resp. a) 6.2 b) 7.2 c) 7.8 d) 6.8	**1**
16	If the discriminant of a quadratic equationis less than zero,then it has (a) Equal roots (b) real roots (c) No real roots (d) can't be determined	**1**
17	A bag contains 8 red, 2 black and 5 white balls. One ball is drawn at random. The probability that the ball drawn is not white is (a) 1/2 (b) 2/3 (c) 1/4 (d) 2/5	**1**
18	If α and β are the zeroes of the polynomial px^2 -2x +3p and α + β = αβ then the value of p is (a) $\frac{-2}{3}$	**1**

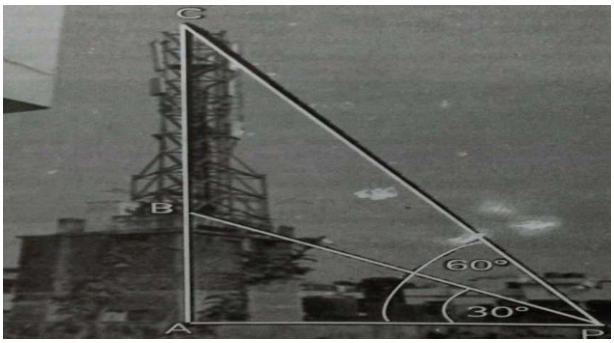
	(b) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) $\frac{-1}{3}$	
	Each of the following questions contains an assertion followed by Reason.Read them and answer the questions on the basis of options: (a) If both assertion and reason is correct and reason is the correct explanation of assertion. (b) If both assertion and reason is correct but reason is not the correct explanation of assertion. (c) If assertion is correct but reason is not correct. (d) If assertion is not correct but reason is correct.	**1**
19	Assertion: The favourable outcomes to the event of getting an even number when a die is thrownare 2,4 and 6 Reason: The outcomes which ensure the occurrence of an event are called favourable outcomes to theevent.	**1**
20	. Assertion: The probability of selecting a number from the numbers 1 to 30 is 1. Reason: For any event E, if P(E) =1, then E is called an impossible event.	**1**
	Section B	
21	α, β are the zeroes of the polynomial $2x^2$ – 8x +5, find the value of $(\alpha+\frac{1}{\beta})$ $(\beta+\frac{1}{\alpha})$. OR If the sum of the zeros of the quadratic polynomial ky^2 + 2y – 3k is equal to twice their product, find k.	**2**
22	Two tankers contain 850 litres and 680 litres of petrol respectively. Find the maximum capacity of a container which can measure the petrol of either tanker in exact number of times.	**2**
23	If the area of a sector of a circle is $\frac{5}{18}$th of the area of that circle, then find the central angle of the sector. 0R From a solid cube of side 7cm, a conical cavity of height 7 cm and radius 3 cm is hollowed out. Find the volume of the remaining solid.	**2**
24	The mode of the following data is 36. Find x	**2**

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	8	10	x	16	12	6	7

25	A bag contains 5 Red balls and some blue balls. If the probability of drawing a blue ball is double that of a Red ball, determine the number of blue balls in the bag?	**2**
	SECTION C	
	Section C consists of 6 questions of 3 marks each.	
26	. Solve the following pair of linear equations by using substitution method. 32 x + 53 y = 7 9x – 10y = 14	**3**
27	Write the coordinates of a point on the x-axis which is equidistant from points A (-2, 0) and B(6, 0).	**3**

28	A quadrilateral ABCD is drawn to circumscribing a circle (figure given). Prove that AB + CD = AD + AC.  OR In given figure, there are two concentric circles of radii 6 cm and 4 cm with centre O. If AP is a tangent to the larger circle and BP to the smaller circle and length of AP is 8cm, find the length of BP.  Fig. 3	**3**
29	The median of the following distribution is 32.5. Find the values of F1and F2. Class | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | Total Frequency | F1 | 5 | 9 | 12 | F2 | 3 | 2 | 40	**3**
30	Show that $(\sqrt{3}+\sqrt{5})^2$ is an irrational number	**3**
31	If α and β are the zeroes of the polynomial x^2-6x+k and $3\alpha+2\beta=20$, find the value of k. 0r Quad polynomial $2x^2-3x+1$ has zeroes as α and β. Now form a quad. polynomial whose zeroes are 3α and 3β .	**3**
	SECTION D	
	Section D consists of 4 questions of 5 marks each.	
32	A motor boat whose speed is 24 km/h in still water takes 1 hour more to go 32 km upstream than to return downstream to the same spot. Find the speed of the stream. OR A train travels 180 km at a uniform speed. If the speed had been 9 km/ hour more, it would have taken 1 hour less for the same journey. Find the speed of the train.	**5**
33	From a solid cylinder whose height is 12 cm and diameter is 10 cm, a conical cavity of same height and same diameter is hollowed out. Find the volume and total surface area of the remaining solid.	**5**
34	If CosA+SinA=$\sqrt{2}Cos\ A$, show that Cos A-SinA=$\sqrt{2}Sin\ A$	**5**

35	Prove that, if a line is drawn parallel to our side of a triangle to intersect the other two sides in distinct points. The other two sides are divided in the same ratio OR In the given figure, P is the mid-point of BC and Q is the midpoint of AP. If BQ when produced meet AC at R, Prove that RA=$\frac{1}{3}$ CA  	**5**
	SECTION E	
	Case study-based questions are compulsory. Each question carries 4 marks	
36	Your friend Veer wants to participate in a 200m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less. He wants to do in 31 seconds. 1.  What will be the AP for given situation? 2. What is the minimum number of days he needs to practice till his goal is Achieved? 3. Which of the following term is not in the AP of the above given situation. OR If nth term of an AP is given bya_n = 2n + 3 then common difference of an AP is	 1 1 2
37	. Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure.	**1**

	 I. Rahul tied the sticks at what angles to each other? II. What is the area of the kite, formed by two perpendicular sticks of length 6 cm and 8 cm? III. Which is the correct similarity criteria applicable for smaller triangles at the upper part of this kite? OR Which is the correct similarity criteria applicable for smaller triangles at the lower part of this kite?	1 2
38	Consider a telecom tower BC fixed on top of a building AB.Thedistancebetween the base of the building and point P on the ground is 48 m. From the point P the angle of elevation of the top of a building B is 30^0 and the angle of elevation of the top of the tower C is $60^{0.}$  A) The height of the building AB is: B) Height of the telecom tower BC is C) The angle of depression from the top of the tower to the point P is **OR** The angle of depression from the top of the building to the point P is	1 1 2

KENDRIYA VIDYALAYA SANGATHAN, JAMMU REGION

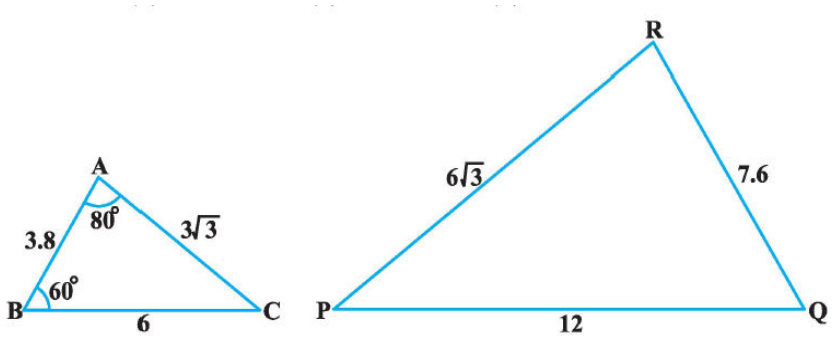
SAMPLE PAPER SET-5

CLASS-X **SUBJECT- MATH (Std)**

TIME: 3 HOURS **M.M- 80**

General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section **A** has 20 MCQs carrying 1 mark each
3. Section **B** has 5 questions carrying 02 marks each.
4. Section **C** has 6 questions carrying 03 marks each.
5. Section **D** has 4 questions carrying 05 marks each.
6. Section **E** has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

	Section A	
S.No	**Section A consists of 20 questions of 1 mark each**	**Marks**
1	The product of LCM and HCF of 510 and 92 is (a)49460 (b) 46920 (c)32440 (d)28480	1
2	The Zeroes of $6x^2 - 3 - 7x$ are (a)$\frac{1}{3}, \frac{2}{3}$ (b)$\frac{3}{7}, \frac{1}{7}$ (c)$\frac{-1}{3}, \frac{3}{2}$ (d)$\frac{-2}{3}, \frac{1}{3}$	1
3	If x=a and y=b is solution of equations x-y=2 and x+y=4, then values of a and bare, respectively (a)3 and 5 (b) 5 and 3 (c) 3 and 1 (d) -1 and -1	1
4	If a and b can take values 1, 2, 3, 4. Then the number of the equations of the form ax^2 + bx + c = 0 having real roots is (a) 6 (b) 7 (c) 10 (d) 12	1
5	If P (–1, 1) is the middle point of the line segment joining A(–3, b) and B(1, b + 4) then the value of b is (a) 1 (b) –1(c) 2 (d) 0	1
6	A point P divides the join of A (5, –2) and B (9, 6) are in the ratio 3: 1. The coordinates of P are (a) (4, 7) (b) (12,4) (c) (11 2 , 5) (d) (8,4)	1
7	If the distance between the points (8, p) and (4, 3) is 5 then value of p is (a) 6 (b) 0 (c) both(a) and (b) (d) none of these	1
8	In the given below figure, the value of $\angle P$ is (a) 60^0 (b)80^0(c) 40^0(d) 100^0 	1

9	In triangle ABC, ∠BAC = 90° and AD ⊥ BC. Then (A) BD. CD = BC^2 (B) AB. AC = BC^2 (C) BD. CD = AD^2 (D) AB. AC = AD^2	1
10	Given three non-collinear points, then the number of circles that can be drawn through these three points are (a) 1 (b) 0 (c) 2 (d) infinite	1
11	The value of $\frac{1-tan^2 45^\circ}{1+tan^2 45^\circ}$ is (a) tan 90° (b) 1 (c) sin 45° (d) 0	1
12	Evaluate (sec A + tan A) (1 – sin A) (a) sec A (b) sin A (c) cosec A (d) cos A	1
13	If the angle of elevation of a tower from a distance of 100m from its foot is 60^0, then the height of the tower is $(a)100\sqrt{3}(b)\frac{200}{\sqrt{3}}$ (c)$50\sqrt{3}(d)\frac{100}{\sqrt{3}}$	1
14	If the sum of the circumferences of two circles with radii R_1 and R_2 is equal to circumference of a circle of radius R, then (a) $R_1 + R_2 = R$(b) $R_1 + R_2 > R$(c) $R_1 + R_2 < R$(d) Can't say	1
15	The total surface area of cylinder of base radius 'r' and height 'h' is (a) 2π(r + h) (b) 2πr(r + h) (c) 3πr(r + h) (d) 4πr(r + h)	1
16	The radius of a spherical balloon increases from 7 cm to 14 cm s air is being pumped into it. The ratio of surface area of the balloon in the two cases is: (a) 4 : 1 (b) 1 : 4 (c) 3 : 1 (d) 1 : 3	1
17	One card is drawn from a well shuffled deck of 52 playing cards. The probability of getting a non-face card is (a) $\frac{3}{13}$(b)$\frac{10}{13}$(c)$\frac{7}{13}$ (d) $\frac{4}{13}$	1
18	In a family of 3 children, the probability of having atleast one boy is: (a) $\frac{7}{8}$ (b) $\frac{1}{8}$(c) $\frac{3}{4}$(d) $\frac{5}{8}$	1
19	**Assertion: the arithmetic mean of following given frequency distribution table is 13.81** x: 4, 7, 10, 13, 16, 19 f: 7, 10, 15, 20, 25, 30 **Reason:** $\bar{x} = \frac{\sum f_i x_i}{\sum f_i}$ (a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b)Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c)Assertion (A) is true but reason (R) is false. (d)Assertion (A) is false but reason (R) is true	1
20	**Assertion**: if the value of mode and mean is 60 and 66 then the value of median is 64 **Reason:** median= (mode+2mean) (a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b)Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)	1

	(c)Assertion (A) is true but reasons (R) is false. (d)Assertion (A) is false but reason (R) is true	
	Section - B	
	Section B consists of 5 questions of 2 marks each.	
21	Can two numbers have 18 as their HCF and 380 as their LCM? Give reasons.	2
22	The sum of 5th term and 9th term of an AP is 72 and the sum of 7th and 12th terms is 97. Find the AP.	2
23	The diameter of the wheels of a bus is 140 cm. How many revolutions per minute must a wheel make in order to move at a speed of 66 km per hour? OR From a solid cube of side 7 cm, a conical cavity of height 7 cm and radius 3 cm is hollowed out. Find the volume of the remaining solid.	2
24	Three coins are tossed simultaneously. What is the probability of getting (a) exactly two tails. (b) at least two heads. OR A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears (a) a prime number less than 23 (b) an even prime number.	2
25	Find the average height of maximum number of students from the following distribution: **Height (incm)** | 160-162 | 163-165 | 166-168 | 169-171 | 172-174 **No.ofstudents** | 15 | 118 | 142 | 127 | 18	2
	Section-C	
	Section C consists of 6 questions of 3 marks each.	
26	Prove that $3 + 2\sqrt{3}$ is an irrational number.	3
27	Find the value of k for which the quadratic equation $k^2 x^2 - 2(k - 1) x + 4 = 0$ has two real equal roots. Or A two-digit number is four times the sum and twice the product of its digits. Find the number	3
28	A sum of Rs. 1000 is invested at 8% simple interest per year. Calculate the interest at the end of each year. Does this interest form an AP? If so, find the interest at the end of 30 years.	3
29	An umbrella has 8 ribs which are equally spaced. Assuming umbrella to be a flat circle of radius 45cm, find the area between the two consecutive ribs of the umbrella. OR Two tangents TP and TQ are drawn from an external point T to a circle with centre O, as shown in figure. If they are inclined to each other at an angle of 100° then what is the value of $\angle POQ$?	3

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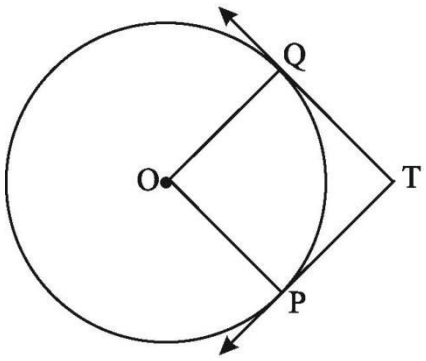
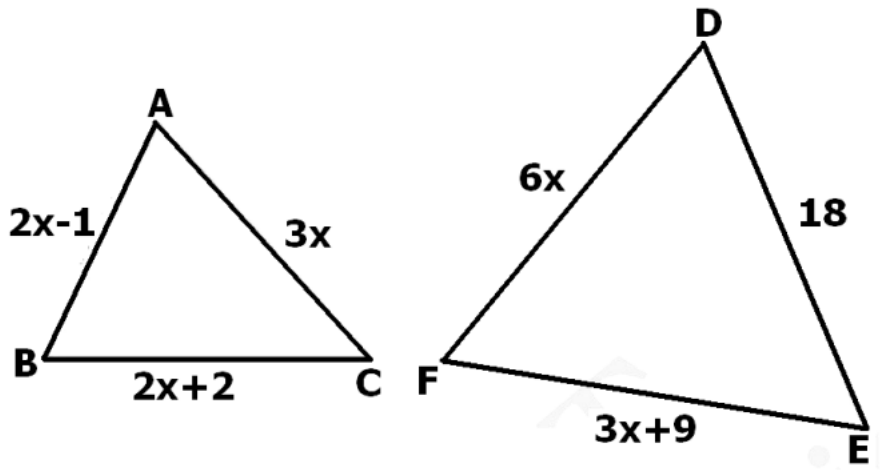
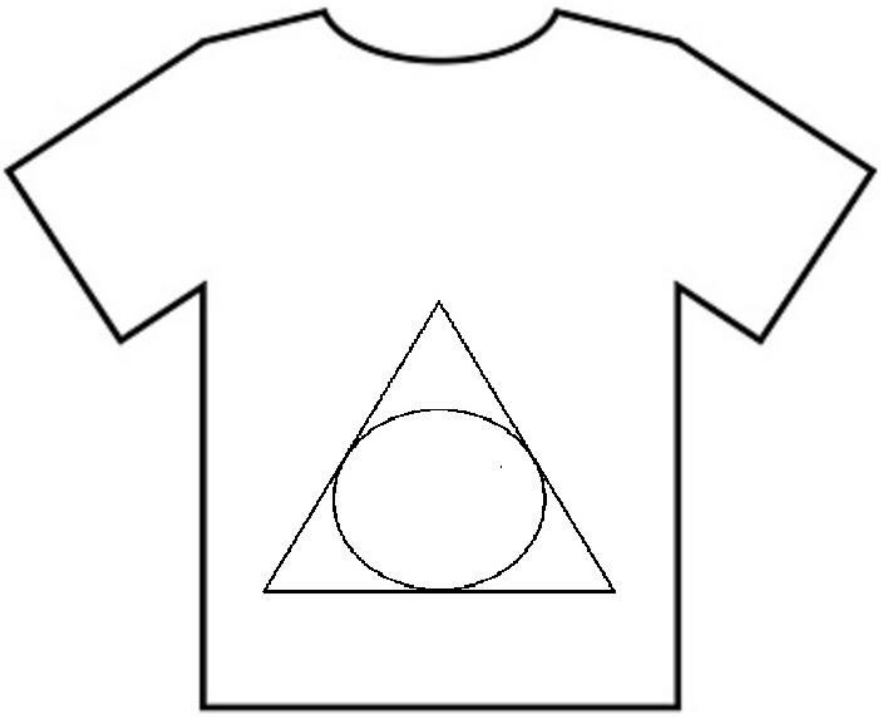
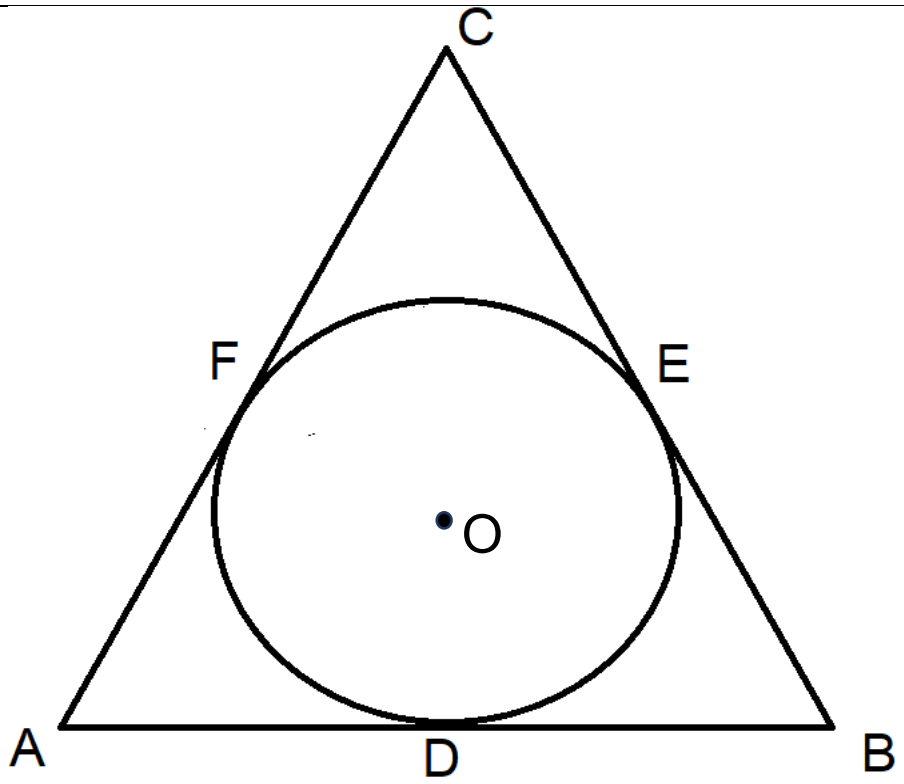
<tr><td></td><td> 
</td><td></td></tr>
<tr><td>30</td><td>A survey regarding the heights (in cms) of 50 girls of a class was conducted and the following data was obtained.
<table>
<tr><td>Height (incm)</td><td>120-130</td><td>130-140</td><td>140-150</td><td>150-160</td><td>160-170</td><td>Total</td></tr>
<tr><td>No.ofgirls</td><td>2</td><td>8</td><td>12</td><td>20</td><td>8</td><td>50</td></tr>
</table>
Find the mean, median and mode of the above data.</td><td>3</td></tr>
<tr><td>31</td><td>Prove that the points A (2, –2), B (14, 10), C (11, 13) and D (–1, 1) are vertices of a rectangle. Find the area of this rectangle.</td><td>3</td></tr>
<tr><td></td><td>SECTION D</td><td></td></tr>
<tr><td></td><td>Section D consists of 4 questions of 5 marks each.</td><td></td></tr>
<tr><td>32</td><td>Solvethefollowingsystemoflinearequationsgraphically:4x-5y +16=0;2x+y-6=0.Findthecoordinatesoftheverticesofthetriangleformedbytheselinesandy-axis.</td><td>5</td></tr>
<tr><td>33</td><td>In a triangle PQR, N is a point on PR such that Q N ⊥ PR. If PN. NR = QN^2, prove that ∠PQR = 90°.
OR
In the below figure, if Δ ABC ~ Δ DEF and their sides are of lengths (in cm) as marked along them, then find the lengths of the sides of each triangle.</td><td>5</td></tr>
</table>

		
34	Provetheidentity:$(\sin A+\operatorname{cosec} A)^2+(\cos A+\sec A)^2=7+\tan^2 A+\cot^2 A$. OR From a point P on the ground the angle of elevation of the top of a 10 m tall building is 30°. A flag is hoisted at the top of the building and the angle of elevation of the top of the flagstaff from P is 45°. Find the length of the flagstaff and the distance of the building from the point P. (You may take 3 = 1.73)	5
35	A cylindrical with radius and height is 4cm and 8cm is filled with Ice-cream and ice-cream is distributed to 10 Children in equal can having hemi-spherical tops. If the height of the conical portion is 4 times the radius of its base, find the radius of the ice-cream cone.	5
	Section-E	
	Case study-based questions are compulsory.	
36	To make his daily office commute comfortable, Ramesh wants to buy a car and plans to take a loan from a bank for this purpose. He repays his total loan of ₹1,18,000 by paying every month starting with the first instalment of ₹1000. If he increases the instalment paid by ₹100 every month, answer the following  (a) What is the amount paid by him in 30th instalment? (b) What is the total amount paid by him in 30 instalments? (c) What is the ratio of first instalment to last instalment? OR What amount does he still have to pay after 30th instalment?	1 1 2

37	 Jayant has been assigned a task to design a logo for sports day to be worn by students and teachers. The logo is designed as shown in figure. A circle with centre O is inscribed in a Δ ABC such that it touches the sides AB, BC and CA at point D, E and F respectively. The lengths of sides AB, BC and CA are 12cm, 8cm and 10cm respectively.	1 1 2



(a) Find Length of CF
(b) Find Length of BE
(c) If radius of circle is 4cm, find the area of ΔOAB.
OR
Find the area of ΔABC.

38 A group of students visited India Gate on a trip. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial is dedicated to troops of British India who died in wars fought between 1914 and 1919. It is also about 138 feet(42m) in height.

(a) What is the angle of elevation if they're standing 42m away from India Gate? 1
(b) What distance should be between the monument and students if they wish to view it from 60 degrees? 1
(c) If altitude of sun is at 60degrees, then what is the height of vertical tower that will cast a shadow of length 20m? 2

OR

India Gate's height is 42m. What will be the cost of the wire if it were to be tied from the top of the monument and reach the ground at elevation angle of 30^0 @ ₹50 per metre?

KENDRIYA VIDYALAYA SANGATHAN, JAMMU REGION

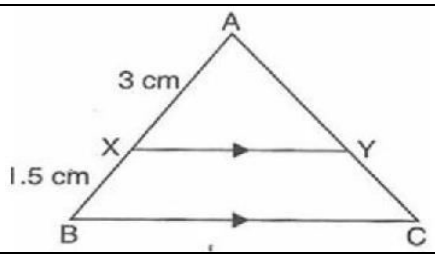
SAMPLE PAPER SET-6

CLASS-X **SUBJECT- MATH (Std)**

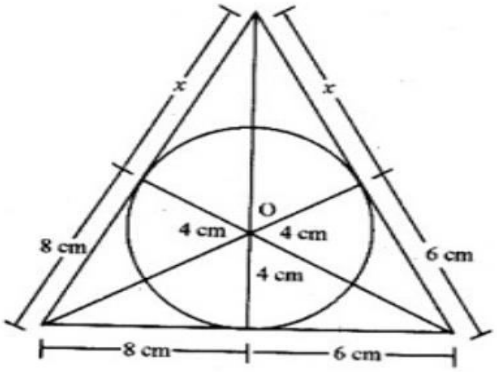
TIME: 3 HOURS **M.M- 80**

General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

	SECTIONA	
SR NO	**SectionAconsistsof20questionsof 1markeach.**	**MARKS**
1	If one end of a diameter of a circle is (4, 6) and the centre is (– 4, 7), then the other end Is a. (– 12, 8) b. (8, – 12) c. (8, 10) d. (8, – 6)	**1**
2	If'' α' and 'β ' are the zeroes of the polynomial $3x^2+11x-4$, then the value of $\alpha^2+\beta^2$, is a $\frac{150}{9}$ b. $\frac{145}{9}$ c. $\frac{152}{9}$ d. $\frac{144}{9}$	**1**
3	One card is drawn from a well shuffled pack of 52 cards. The probability of getting an ace Is a $\frac{1}{52}$ b. $\frac{1}{13}$ c. $\frac{4}{13}$ d. $\frac{2}{13}$	**1**
4	A system of two linear equations in two variables is consistent, if their graphs a. do not intersect at any point b. cut the x – axis c. intersect only at a point d. coincide	**1**
5	If the distance between the points (p, – 5) and (2, 7) is 13 units, then the value of 'p' is a. -3, -7 b. 3, -7 c. 3, 7 d. -3, 7	**1**
6	One card is drawn from a well shuffled deck of 52 playing cards. The probability of getting a non-face card is a. $\frac{3}{13}$ b. $\frac{10}{13}$ c. $\frac{7}{13}$ d. $\frac{4}{13}$	**1**
7	The value of $2\tan^2 45°+\cos^2 30°-\sin^2 60°$ is a. 0 b. 1 c. 2 d. -2	**1**
8	If $\sin A+\sin^2 A=1$, then the value of $\cos^2 A+\cos^4 A$ is a. – 1 b. 2 c. 0 d. 1	**1**
9	In the given figure XY ‖ BC. If AX = 3cm, XB = 1.5cm and BC = 6cm, then XY is equal to a. 6 cm. b. 4.5 cm c. 3 cm. d. 4 cm 	**1**

10	ABCD is a trapezium in which AB ‖ DC and AB = 2DC. Diagonals AC and BD intersect at O. If ar(ΔAOB)= 84 cm^2 , then ar(ΔCOD) is equal to a. 24 cm^2 b. 42 cm^2 c. 28 cm^2 d. 21 cm^2	**1**
11	PQ is a tangent drawn from a point P to a circle with centre O and QOR is a diameter of the circle such ∠POR= 120°, then ∠OPQ is a. 60° b. 35° c. 30° d. 45°	**1**
12	The area of a square that can be inscribed in a circle of radius 10 cm is a. 100 sq. cmb. 300 sq. cmc. 200 sq. cmd. 150 sq. cm	**1**
13	The longest rod that can be placed inside the cube is a. 3 edgeb. $\sqrt{2}$ edge c. $\sqrt{3}$ edge d.$\sqrt{5}$ edge	**1**
14	$\text{Mode} + \frac{2}{3}(\text{Mean} - \text{Mode}) =$ a. Modeb. Medianc. Meand. None of these	**1**
15	If a chord subtends an angle of 60° at the centre, then the area of the corresponding segment is a.$\left(\frac{\pi}{6} - \frac{\sqrt{3}}{4}\right)r^2$ sq. units b. $\left(\frac{\pi}{2} - \frac{\sqrt{3}}{2}\right)r^2$ sq. units c. $\left(\frac{\pi}{6} + \frac{\sqrt{3}}{2}\right)r^2$ sq. units d. $\left(\frac{\pi}{2} + \frac{\sqrt{3}}{2}\right)r^2$ sq. units	**1**
16	For the following distribution the sum of lower limits of the median class and modal class is **Class** | 60 – 70 | 70 – 80 | 80 – 90 | 90 – 100 | 100 – 110 **Frequency** | 10 | 15 | 12 | 20 | 9 a. 190 b. 20 c. 180 d. 170	**1**
17	A box contains 3 blue balls, 2 white balls and 4 red balls. If a ball is drawn at random from the box, the probability of getting a white ball is a. $\frac{2}{9}$b. $\frac{3}{9}$c. 1 d. $\frac{4}{9}$	**1**
18	If sin **θ** **is** $\frac{5}{13}$then cos **θ** = a. $\frac{13}{12}$ b. $\frac{5}{13}$ c. $\frac{12}{5}$d. $\frac{12}{13}$	**1**
	DIRECTION: In the question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R)	
19	**Assertion:12^n** ends with the digit zero, where n is any natural number. a) **Reason**: Any number ends with digit zero, if its prime factor is of the form 2^m 5^n, where m and n are whole numbers**.** (a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A). (b)Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A). (c)Assertion (A) is true but reason (R) is false. (d)Assertion (A) is false but reason (R) is true.	**1**
20	**Assertion:** C is the mid-point of PQ, if P is (4, x), C is (y, - 1) and Q is (- 2, 4), then x and y respectively are -6 and 1. **Reason** : The mid-point of the line segment joining the points P(x_1 , y_1) and Q(x_2 , y_2) is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ (a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A). (b)Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A). (c)Assertion (A) is true but reason (R) is false.	**1**

	(d)Assertion (A) is false but reason (R) is true	
	SECTIONB	
	SectionBconsistsof 5questionsof 2 markseach.	
21	Explain why (7 x 11 x 13) +13 and (7 x 6 x 5 x 4 x 3 x2 x1) + 5 are composite numbers?	**2**
22	Find the value of x+y, if 3x -2y = 5 and 3y -2x = 3.	**2**
23	The area enclosed between the concentric circles is 770 cm^2. If the radius of the outer circle is 21 cm, find the radius of the inner circle. **OR** The wheels of a car make 2500 revolutions in covering a distance of 4.95 km. Find the diameter of a wheel.	**2**
24	A class teacher has the following absentee record of 40 students of a class for the whole term. Number of days: 0-6 | 6-10 | 10-14 | 14-20 | 20-28 | 28-38 | 38-40 Number of students: 11 | 10 | 7 | 4 | 4 | 3 | 1 Find the mean number of days a student was absent.	**2**
25	A bag contains 5 black, 7 red and 3 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is(i) red (ii) black or white (iii) not black. **OR** A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears i. a two-digit number ii. a perfect square number iii. a number divisible by 5.	**2**
	SECTIONC	
	SectionCconsistsof 6questionsof 3markseach.	
26	Prove that $\frac{2+\sqrt{3}}{5}$ is an rational number, given that $\sqrt{3}$ is an irrational number.	**3**
27	If α and β are the zeros of the quadratic polynomial $f(x) = 3x^2 - 4x + 1$, find a quadratic polynomial whose zeros are $\frac{\alpha^2}{\beta}$and $\frac{\beta^2}{\alpha}$.	**3**
28	If the points A (a, -11), B (5, b), C (2, 15) and D (1, 1) are the vertices of a parallelogram ABCD, find the values of a and b.	**3**
29	A train covered a certain distance at a uniform speed. If the train would have been 10 km/h faster, it would have taken 2 hours less than the scheduled time. And, if the train were slower by 10 km/h, it would have taken 3 hours more than the scheduled time. Find the distance covered by the train. **OR** A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid ₹ 27 for a book kept for seven days, while Susy paid ₹21 for the book, she kept for five days. Find the fixed charge and the charge for each extra day.	**3**
30	The radius of the incircle of a triangle is 4 cm and the segment into which one side is divided by the point of contact are 6 cm and 8 cm. Determine the other two sides of the triangle.  	**3**
31	Find the mean marks per student, using assumed-mean method.	**3**

Marks	0 -10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Number of students	12	18	27	20	17	6

OR

In a health check-up, the number of heart beats of 40 women are recorded in the following table:

Number of heart beats / minute	65-69	70-74	75-79	80-84
Number of women	2	18	16	4

Find the mean of data.

SECTIOND

SectionDconsists of4questionsof 5markseach.

32 A Train travels a distance of 300 km at a uniform speed. If the speed of the train is increased by 5 km an hour, the journey would have taken two hours less. Find the original speed of the train. **5**

OR

A peacock is sitting on the top of a pillar which is 9m high. From a point, 27m away from the bottom of the pillar, a snake is coming to its hole at the base of the pillar.seeing the snake, the peacock pounces it. If their speeds are equal, at what distance from the hole is the snake caught ?

33 CD and GH are respectively the bisectors of ∠ACB and ∠EGF such that D and H lie on sides AB and FE of ΔABC and ΔEFG respectively. If ΔABC ~ ΔFEG, show that **5**

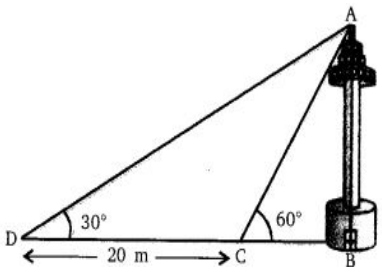
(i) $\frac{CD}{GH} = \frac{AC}{FG}$ (ii) ΔDCB ~ ΔHGE

(iii) ΔDCA ~ ΔHGF

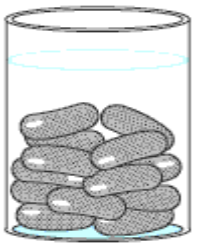
34 Two poles of equal heights are standing opposite each other on either side of the road, which is 80 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 60° and 30° respectively. Find the height of the poles and the distance of the point from the poles. **5**

OR

A TV tower stands vertically on a bank of a canal. From a point on the other bank directly opposite the tower, the angle of elevation of the top of the tower is 60°. From another point 20 m away from this point on the line joining this point to the foot of the tower, the angle of elevation of the top of the tower is 30° (see the given figure). Find the height of the tower and the width of the CD and 20 m from pole AB.

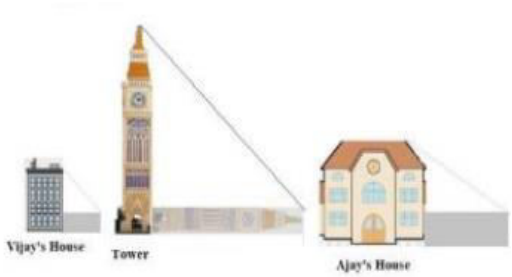
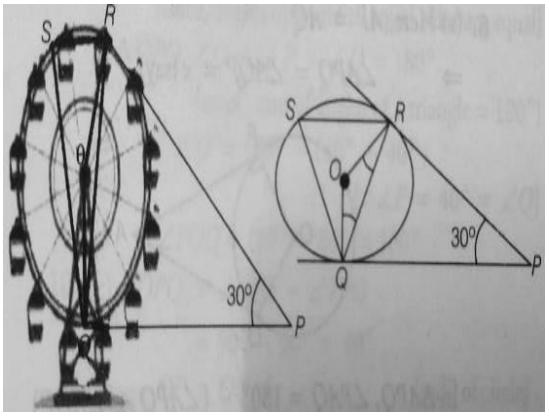


35 A gulab jamun, contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 gulab jamuns, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm. **5**



SECTIONE

Casestudybasedquestionsarecompulsory.

36	Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house, if 20m when Vijay's house casts a shadow a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m shadow on the ground.  Q1. What is the height of the tower? (1) Q2. What is the height of Ajay's house? (1) Q3. When the tower casts a shadow of 40m, same time what will be the length of the shadow of Ajay's House? (2)	**4**
37	India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6^{th} year and 22600 in 9^{th} year. **1.** Find the production during first year. (1) **2.** Find the production during 8^{th} year. (1) 3. Find the difference of the production during 7^{th} year and 4^{th} year	**4**
38	A Ferris wheel (or a big wheel in the United Kingdom) is an amusement ride consisting of a rotating upright wheel with multiple passenger, carrying components (commonly referred to as passenger cars, cabins, tubs, capsules, gondolas, or pods) attached to the rim in such a way that as the wheel turns, they are kept upright, usually by gravity. After taking a ride in Ferris wheel, Aarti came out from the crowd and was observing her friends who were enjoying the ride. She was curious about the different angles and measures that the how wheel will from. She forms the figure as given below.  (i) In the given figure, find ∠ROQ. (1) (ii) Find ∠RQP. (1) (iii) Find ∠ORP. (2)	**4**

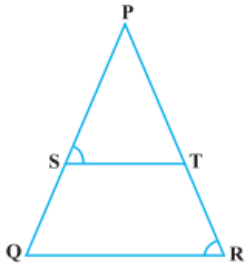
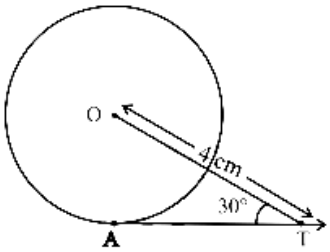
Class- X Session- 2022-23
Subject- Mathematics (Standard)
Sample Question Paper- SET 7

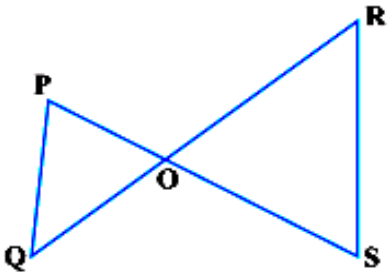
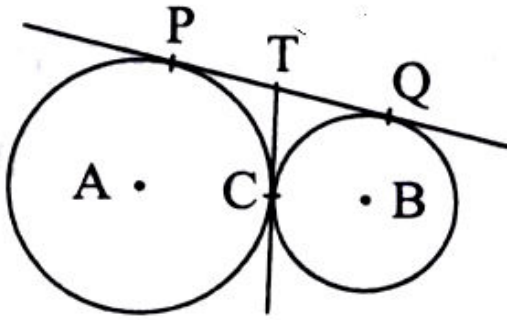
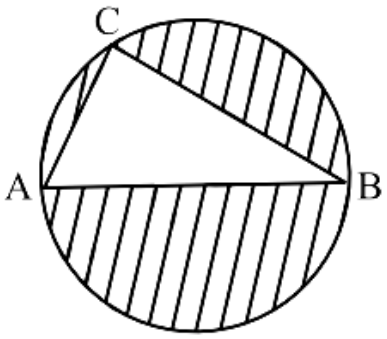
Time Allowed: 3 Hrs. **Maximum Marks : 80**

General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

	SECTION A	
S. NO.		MARKS
Q.1:-	The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is (a) 10 (b) 100 (c) 504 (d) 2520	1
Q.2:-	Find the values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is (a) 0 only (b) 4 (c) 8 only (d) 0, 8	1
Q.3:-	If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and –3, then (a) a = –7, b = –1 (b) a = 5, b = –1 (c) a = 2, b = – 6 (d) a = 0, b = – 6	1
Q.4:-	If a pair of linear equations is consistent, then the lines will be (a) parallel (b) always coincident (c) intersecting or coincident (d) always intersecting	1
Q.5:-	If the distance between the points (4, p) and (1, 0) is 5, then the value of p is (a) 4 only (b) ± 4 (c) – 4 only (d) 0	1
Q.6:-	If ΔABC ~ Δ EDF and ΔABC is not similar toΔ DEF, then which of the following is not true? (a) BC × EF = AC×FD (b) AB × EF = AC ×DE (c) BC × DE = AB × EF (d) BC × DE = AB × FD	1
Q.7:-	If ΔABC is a right angled at C, then the value of cos(A + B) is (a) 0 (b) 1 (c) $\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$	1
Q.8:-	If $\sin\theta + \cos\theta = \sqrt{2}$, then $\tan\theta + \cot\theta$ = (a) 1 (b) 2 (c) 3 (d) 4	1
Q.9:-	In triangles ABC and DEF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar, when (a) ∠B = ∠E (b) ∠A =∠D (c) ∠B = ∠D (d) ∠A = ∠F	1
Q.10:-	Area of the largest triangle that can be inscribed in a semi-circle of radius R units is (a) R^2 sq. units (b) $\frac{1}{2}R^2$ sq. units (c) 2 R^2 cm (d) $\sqrt{2}R^2$ cm	1
Q.11:-	Volumes of two spheres are in the ratio 64 : 27. The ratio of their surface areas is (a) 3 : 4 (b) 4 : 3 (c) 9 : 16 (d) 16 : 9	1

Q.12:-	In the given fig. $\frac{PS}{SQ} = \frac{PT}{TR}$, ∠PST = ∠PRQ. Then triangle PQR is _____  (a) Equilateral triangle (b) Isosceles triangle (c) Scalene triangle (d) None of the above	1
Q.13:-	In Figure, AT is a tangent to the circle with centre O such that OT = 4 cm and ∠OTA = 30°. Then AT is equal to  (a) 4 cm (b) 2 cm (c) $2\sqrt{3}$ cm (d) $4\sqrt{3}$ cm	1
Q.14:-	If the difference of Mode and Median of a data is 24, then the difference of median and mean is (a) 8 (b) 12 (c) 24 (d) 36	1
Q.15:-	The area of the square that can be inscribed in a circle of radius 8 cm is (a) 256 cm² (b) 128 cm² (c) $64\sqrt{2}$ cm² (d) 64 cm²	1
Q.16:-	Construction of a cumulative frequency table is useful in determining the (a) mean (b) median (c) mode (d) all the above three measures	1
Q.17:-	Which of the following cannot be the probability of an event? (a) $\frac{1}{3}$ (b) 0.1 (c) 3% (d) $\frac{17}{16}$	1
Q.18:-	If $\sin\theta - \cos\theta = 0$, then the value of $(\sin^4\theta + \cos^4\theta)$ is (a) 1 (b) $\frac{3}{4}$ (c) $\frac{1}{2}$ (d) $\frac{1}{4}$	1
	Assertion and Reason based questions DIRECTION: In the question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option Statement	
Q.19:-	**Statement (A):-** LCM and HCF of p²q and pq² is p²q² and p q respectively. **Reason (R):** The LCM of two numbers is always equal to their product. (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false (d) Assertion (A) is false but reason (R) is true.	1
Q.20:-	**Statement (A):-** The mid-point of the line segment joining the points A (–2, 8) and B (–6, – 4) is (– 4, 2) **Reason (R):** The coordinates of the mid-point of the line segment joining the points P (x_1, y_1) and Q (x_2, y_2) are $\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}$ (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)	1

	(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false (d) Assertion (A) is false but reason (R) is true.	
	SECTION B	
	Section B consists of 5 questions of 2 marks each.	
Q.21:-	For which value(s) of k will the pair of equations $kx + 3y = k - 3$ And $12x + ky = k$ have no solution?	2
Q.22:-	In Fig., if PQ || RS, prove that Δ POQ ~ Δ SOR  	2
Q.23:-	In the fig PQ is common tangent to the given circles, which touch externally at C. If PT = 4 cm find the length of PQ.  	2
Q.24:-	In Fig., AB is a diameter of the circle, AC = 6 cm and BC = 8 cm. Find the area of the shaded region (Use π = 3.14).  **OR** A cow is tied with a rope of length 14 m at the corner of a rectangular field of dimensions 20m × 16m. Find the area of the field in which the cow can graze.	2
Q.25:-	In a right triangle ABC, right-angled at B, if tan A = 1, then verify that 2 sin A cos A = 1. OR If $\sin(A - B) = \frac{1}{2}$, $\cos(A + B) = \frac{1}{2}$, $0° < A + B \leq 90°$, A > B, find A and B.	2
	SECTION C	
	Section C consists of 6 questions of 3 marks each.	
Q.26:-	Prove that $2 - 3\sqrt{5}$ is an irrational number.	3
Q.27:-	If $\alpha and \beta$ are the zeroes of the polynomial x^2 - 6x +8, find the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$	3
Q.28:-	For which values of 'a' and 'b' will the following pair of linear equations have infinitely many solutions? x + 2y= 1 (a – b)x + (a + b)y = a + b – 2 **OR** A railway half ticket costs half the full fare, but the reservation charges are the same on a half ticket as on a full ticket. One reserved first class ticket from the station A to B costs Rs 2530. Also, one reserved first class ticket and one reserved first class half ticket from A to B costs Rs 3810. Find the full first class fare from station A to B, and also the reservation charges for a ticket.	3

Q.29:-	Simplify $(1 + \tan^2 \theta)(1 - \sin\theta)(1 + \sin\theta)$	3
Q.30:-	In figure PA and PB are tangents from P to the circle with centre O and Q is any point on the circle. If CD is tangent to the circle at Q, Prove that PC + CQ = PD + DQ **OR** In fig. AP and BP are tangents to a circle with centre O, such that AP = 6 cm and ∠APB = 60°. Find the length of chord AB.	3
Q.31:-	In a game, the entry fee is Rs 5. The game consists of a tossing a coin 3 times. If one or two heads show, Sweta gets her entry fee back. If she throws 3 heads, she receives double the entry fees. Otherwise she will lose. For tossing a coin three times, find the probability that She (i) loses the entry fee. (ii) gets double entry fee. (iii) just gets her entry fee.	3
	SECTION D	
	Section D consists of 4 questions of 5 marks each.	
Q.32:-	In the centre of a rectangular lawn of dimensions 50 m x 40 m, a rectangular pond has to be constructed so that the area of the grass surrounding the pond would be 1184 m2 [see Figure]. Find the length and breadth of the pond. **OR** In a flight of 2800km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 100 km/hr from its usual speed and the time of the flight increased by 30 min. Find the scheduled duration of the flight.	5
Q.33:-	In Fig., OB is the perpendicular bisector of the line segment DE, FA ⊥ OB and F E intersects OB at the point C. Prove that $\frac{1}{OA} + \frac{1}{OB} = \frac{2}{OC}$	5
Q.34:-	A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top which is open, is 5 cm. It is filled with water upto the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of water flows out. Find the number of lead shots dropped into the vessel. **OR** A building has 25 cylindrical shaped poles. Each has a radius of 28 cm and a height of 4 cm. Find the cost of painting curved surface of all poles at the rate of Rs. 8 per m².	5
Q.35:-	A survey conducted on 20 households in a locality by a group of students resulted in the	5

following frequency table for the number of family members in a household:

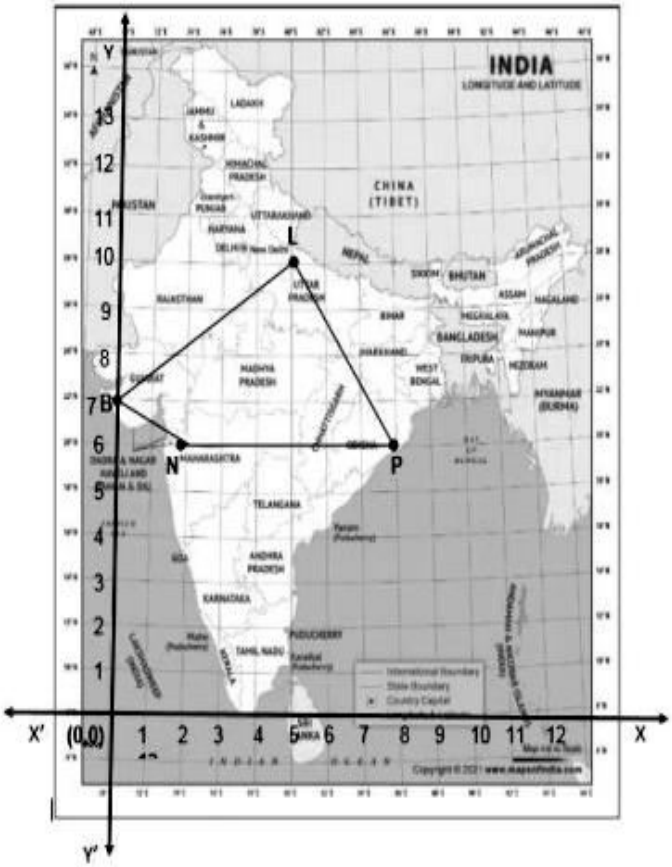
Family Size	1 – 3	3 – 5	5 – 7	7 – 9	9 – 11
Number of families	7	8	2	2	1

Find the mode and median of the above data. Also find the mean using empirical relationship of measure of central tendency.

SECTION E

Case study based questions are compulsory

Q.36:- In a GPS, The lines that run east-west are known as lines of latitude, and the lines running north-south are known as lines of longitude. The latitude and the longitude of a place are its coordinates and the distance formula is used to find the distance between two places. The distance between two parallel lines is approximately 150 km. A family from Uttar Pradesh planned a round trip from Lucknow (L) to Puri (P) via Bhuj (B) and Nashik (N) as shown in the given figure below.



Based on the above information answer the following questions using the coordinate geometry.

(I). Find the distance between Lucknow (L) to Bhuj(B). 1

(II). If Kota (K), internally divide the line segment joining Lucknow (L) to Bhuj (B) into 3 : 2 then find the coordinate of Kota (K). 1

(III). Name the type of triangle formed by the places Lucknow (L), Nashik (N) and Puri (P). 2

[OR]

Find a place (point) on the longitude (y-axis) which is equidistant from the points Lucknow (L) and Puri (P).

Q.37:- In the month of April to June 2022 the exports of passengers cars from India increased by 26% in the corresponding quarter of 2021-22, as per our report. A care manufacturing company planned to produced 1800 cars in 4^{th} year and 2006 cars in 8^{th} year. Assuming that the production increased by a fix number every year.

Based on the above information answer the following questions:-

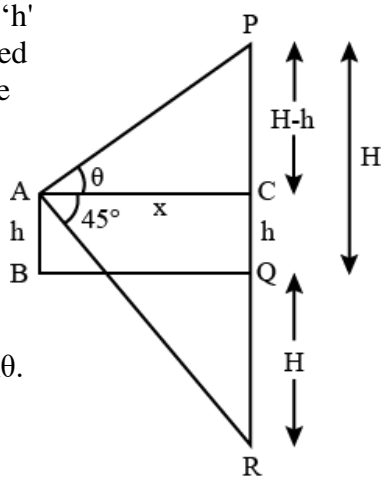
(i) Find the production in the first year. 1

(ii) Find the production in 12^{th} year. 1

(iii) Find the total production in first 10 year

OR 2

In which year the total production year will reach to 31200 cars?

Q.38:-	A person standing on the roof of a house boat at height (AB) 'h' from the surface of the Dal Lake in Kashmir. Then he observed that the angle of depression of reflection of a cloud in the lake is 45^0.If the angle of elevation of a cloud from that point where he is standing is θ. (i) Then prove that the height of the cloud (H) above the lake is $h\left(\frac{1+tan\theta}{1-tan\theta}\right)$. **OR** If the angle of depression of reflection is taken as Φ instead of 45^0, then find the height of cloud in terms of tanΦ and tanθ. (ii) Here in this case, the angle of depression and angle of elevation can be taken of equal measurement? Why? (iii) If angle of elevation θ = 60^0 and height 'h' = $(1-\sqrt{3})$, then what will be the height of cloud from the surface of lake?	 2 1 1

KENDRIYA VIDYALAYA SANGATHAN, JAMMU REGION

SAMPLE PAPER SET-8

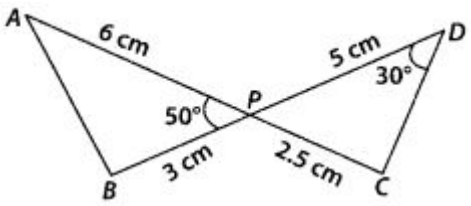
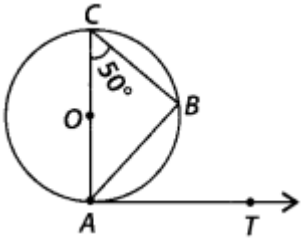
CLASS-X **SUBJECT- MATH (Std)**

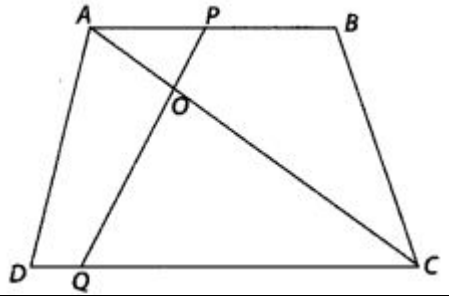
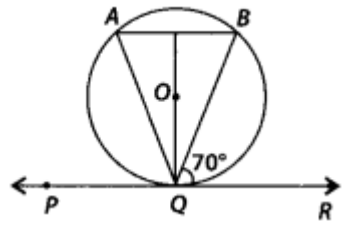
TIME: 3 HOURS **M.M- 80**

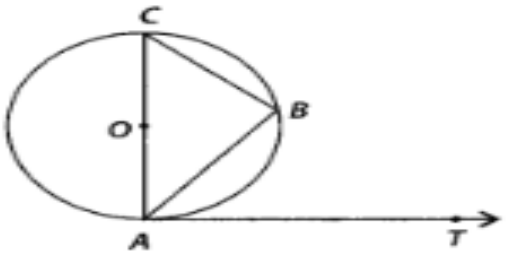
General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section **A** has 20 MCQs carrying 1 mark each
3. Section **B** has 5 questions carrying 02 marks each.
4. Section **C** has 6 questions carrying 03 marks each.
5. Section **D** has 4 questions carrying 05 marks each.
6. Section **E** has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

	SECTION A	
	Section A consists of 20 questions of 1 mark each.	
S. NO		MARKS
1	Every positive odd integer of the form: (a) 2m (b) m(C) 2m-1(d) 2m+1	1
2	Which of the following equations has the sum of its roots as 3? (a) $2x^2 - 3x + 6 = 0$ (b) $-x^2 + 3x - 3 = 0$ (c) $\sqrt{2}x^2 - 3/\sqrt{2}\,x + 1 = 0$ (d) $3x^2 - 3x + 3 = 0$	1
3	If one of the zeroes of the quadratic polynomial $(k-1)x^2 + k\,x + 1$ is -3, then the value of k is (a) 4 /3 (b) –4 /3 (c) 2 /3 (d) –2/ 3	1
4	If 1/2 is a root of the equation $x^2 + kx - 5/4 = 0$, then the value of k is (a) 2 (b) -2 (c) 14 (d)12	1
5	If in two triangles ABC and PQR, AB/ QR=BC/ PR=CA/ PQ then (a) $\Delta PQR \sim \Delta CAB$ (b) $\Delta PQR \sim \Delta ABC$ (c) $\Delta CBA \sim \Delta PQR$ (d) $\Delta BCA \sim \Delta PQR$	1
6	It is given that $\Delta ABC \sim \Delta DFE$, $\angle A = 30°$, $\angle C = 50°$, AB = 5 cm, AC = 8 cm and DF= 7.5 cm. Then, the following is true: (a) DE= 12 cm, $\angle F = 50°$ (b) DE= 12 cm, $\angle F = 100°$(c) EF= 12 cm, $\angle D = 100°$(d) EF= 12 cm, $\angle D = 30°$	1
7	In the figure, two line segments AC and BD intersect each other at the point P such that PA = 6 cm, PB = 3 cm, PC = 2.5 cm, PD = 5 cm, $\angle APB = 50°$ and $\angle CDP = 30°$. Then, $\angle$ PBA is equal to	1

	 (a) 50° (b) 30° (c) 60° (d) 100°	
8	If AOBC is a rectangle whose three vertices are A(0, 3), O(0, 0) and B(5, 0), then the length of its diagonal is (a) 5 (b) 3 (c) √34 (d) 4	1
9	Given that $\sin\theta = a / b$, then $\cos\theta$ is equal to (A) $\frac{b}{\sqrt{b^2-a^2}}$ (B) $\frac{b}{a}$ (C) $\frac{\sqrt{b^2-a^2}}{b}$ (D) $\frac{a}{\sqrt{b^2-a^2}}$	1
10	A pole 6m high casts a shadow $2\sqrt{3}$ m long on the ground, then the Sun's elevation is (a) 60^0(b) 45°(C) 30°(d) 90°	1
11	In figure, AB is a chord of the circle and AOC is its diameter such that ∠ACB = 50°. If AT is the tangent to the circle at the point A, then ∠BAT is equal to  (a) 65° (b) 60° (c) 50° (d) 40°	1
12	Area of the largest triangle that can be inscribed in a semi-circle of radius r units is (a) r^2 squnits (b) 1/2 r^2 sq units (c) $2r^2$ sq units (d) $\sqrt{2}\ r^2$ sq units	1
13	If two solid hemispheres of same base radius r are joined together along their bases, then curved surface area of this new solid is (a) $4\pi r^2$ (b) $6\pi r^2$ (c) $3\pi r^2$ (d) $8\pi r^2$	1
14	The mode and mean is given by 7 and 8, respectively. Then the median is: (a) 1/13 (b) 13/3 (c) 23/3 (d) 33	1
15	The area of the circle inscribed in a square of side a cm is (a) πa^2 sq units (b) πa^2 / 4 sq units (c) a^2 sq units (d) $\pi/4$ sq units	1
16	**The mean of following distribution is:** X_i: 11, 14, 17, 20 f_i: 3, 6, 8, 7 (a) 15.6 (b) 17 (c) 14.8 (d) 16.4	1

17	If P (A) denotes the probability of an event A, then (a) P(A) < 0 (b) P(A) > 1 (c) $0 \leq P(A) \leq 1$ (d) $-1 \leq P(A) \leq 1$	1
18	If ΔABC is right angled at C, then the value of cos (A+B) is **(A) 0** **(B) 1** **(C)** $\frac{1}{2}$ **(D)** $\frac{\sqrt{3}}{2}$	1
19	DIRECTION: In the question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option **Statement A (Assertion):** A number N when divided by 15 gives the remainder 2. Then the remainder is same when N is divided by 5. **Statement R (Reason) :** √3 is an irrational number. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A). (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but Reason (R) is true.	1
20	**Statement A (Assertion):** The points (- 4, 0), (4, 0) and (0, 3) are the vertices of a isosceles triangle **Statement R (Reason) :** An isosceles triangle has two sides equal. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A). (c) Assertion (A) is true but Reason (R) is false. (d) Assertion (A) is false but Reason (R) is true.	1
	SECTION B	
	Section B consists of 5 question of 2 marks each	
21	Solve for x and y :- x-y+1 = 0 ; 4x +3y -10 =0	2
22	In the figure if AB ‖ DC and AC and PQ intersect each other at the point O, prove that OA . CQ = OC . AP. 	2
23	In figure, if PQR is the tangent to a circle at Q whose centre is O, AB is a chord parallel to PR and ∠BQR = 70°, then ∠AQB is equal to 	2

24	Find the area of a sector of a circle of radius 28 cm and central angle 45°. OR The wheel of a motor cycle is of radius 35 cm. How many revolutions per minute must the wheel make, so as to keep a speed of 66 km/h?	2
25	If $\sqrt{3}\tan\theta = 1$, then find the value of $\sin^2\theta - \cos^2\theta$. OR If $\sin\theta - \cos\theta = 0$, then the value of $(\sin^4\theta + \cos^4\theta)$?	2
	SECTION C	
	Section C consists of 6 question of 3 marks each	
26	To prove Prove that $\sqrt{3} + 2$ is irrational	3
27	If α and β are the zeros of $x^2 + 7x + 12$ then find the value of $1/\alpha + 1/\beta - 2\alpha\beta$	3
28	A two-digit number is obtained by either multiplying the sum of the digits by 8 and then subtracting 5 or by multiplying the difference of the digits by 16 and then adding 3. Find the number. OR Vijay had some bananas and he divided them into two lots A and B. He sold the first lot at the rate of ₹ 2 for 3 bananas and the second lot at the rate of ₹ 1 per banana and got a total of ₹ 400 If he had sold the first lot at the rate of ₹ 1 per banana and the second lot at the rate of ₹ 4 for 5 bananas, his total collection would have been ₹ 460. Find the total nmber of bananas he had.	3
29	Given that $\sin\theta + 2\cos\theta = 1$, then prove that $2\sin\theta - \cos\theta = 2$.	3
30	If AB is a chord of a circle with centre O, AOC is a diameter and AT is the tangent at A as shown in figure. Prove that $\angle BAT = \angle ACB$  OR If a hexagon ABCDEF circumscribe a circle, prove that AB + CD + EF = BC + DE + FA.	3
31	Two dice are thrown together. Find the probability that the product of the numbers on the top of the dice is (i) 6 (ii) 12 (iii) 7	3
	SECTION D	
	Section D consists of 4 question of 5 marks each	
32	Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank. **OR** A train, travelling at a uniform speed for 360 km, would have taken 48 minutes less to travel the same distance if its speed were 5 km/h more. Find the original speed of the train	5
33	0 is the point of intersection of the diagonals AC and BD of a trapezium ABCD with AB ‖ DC.	5

	Through 0, a line segment PQ is drawn parallel to AB meeting AD in P and BC in Q, prove that PO = QO.	
34	A factory manufactures 120000 pencils daily. The pencils are cylindrical in shape each of length 25 cm and circumference of base as 1.5 cm. Determine the cost of colouring the curved surfaces of the pencils manufactured in one day at ₹ 0.05 per dm^2. OR 500 persons are taking a dip into a cuboidal pond which is 80 m long and 50 m broad. What is the rise of water level in the pond, if the average displacement of the water by a person is 0.04 m^3?	5
35	Find the unknown entries a, b, c, d, e and f in the following distribution of heights of students in a class	5

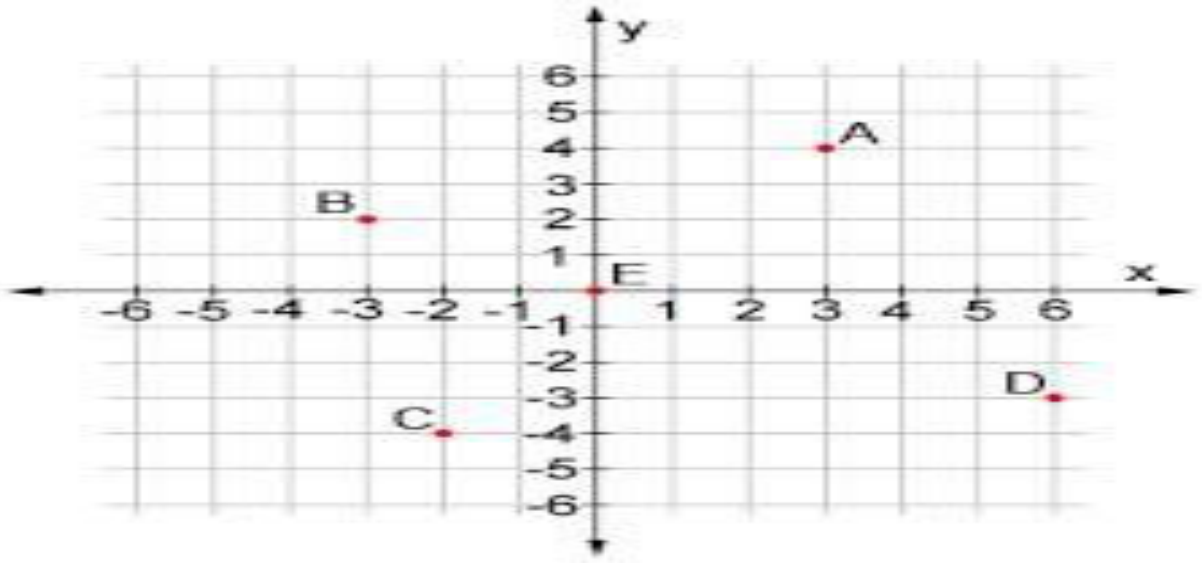
Height(in cm)	frequency	Cumulative frequency
150-155	12	a
155-160	b	25
160-165	10	c
165-170	d	43
170-175	e	48
175-180	2	f
	50	

SECTION E

Case study based question are compulsory

36 Morning assembly is an integral part of the school's schedule. Almost all the schools conduct morning assemblies which include prayers, information of latest happenings, inspiring thoughts, speech, national anthem, etc The positive effects of attending school assemblies can be felt throughout life. Have you noticed that in school assembly you always stand in row and column and

this make a coordinate system. Suppose a school have 100 students and they all assemble in prayer in 10 rows as given below. Here A B, ,C and D are four friend Amar, Bharat, Colin and Dravid.



	(i) What is the distance between A and B ? **(ii)** Is the distance between A and C is same as of distance between A and B ? (iii)Determine the type of quadrilateral formed by these 4 friends seating arrangement . **OR** If Amar has to give badges to other two friends Bharat andDravid respectively and again returns to his position what total distance hecovers?	
37	Kanika was given her pocket money on Jan 1st, 2008. She puts ₹ 1 on Day 1, ₹ 2 on Day 2, ₹ 3 on Day 3, and continued doing so till the end of the month, from this money into her piggy bank. She also spent ₹ 204 of her pocket money and found that the end of the month she still had ₹ 100 with her.  i) What is the first term and common difference ? ii) How much was her pocket money for the month? OR How much money she has in her piggy bank? iii) What is the sum of money spent and money left with Kanika ?	1 2 1
38	A hot air ballon is flying in the sky just above the building the children looking from the window to the baloon.The lower window of a house is at a height of 2 m above the ground and its upper window	

	is 4 m vertically above the lower window  . At certain instant the angles of elevation of a balloon from these windows are observed to be 60° and 30°, respectively. (i) Draw a neat labeled figure to show the above situation diagrammatically. (ii) Find the height of the balloon above the ground Or Find the horizontal distance of the building to from the balloon iii)What is the distance between lower window to balloon .	1 2 1

KENDRIYA VIDYALAYA SANGATHAN, JAMMU REGION

SAMPLE PAPER SET- 9

CLASS – X **SUBJECT- MATHS (STD)**

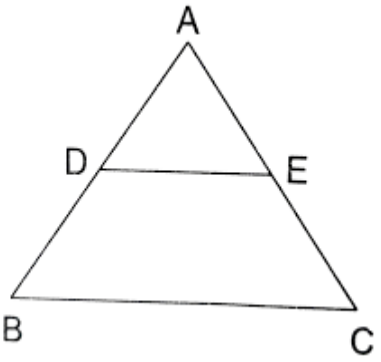
TIME – 3 HOURS **M.M- 80 MARKS**

General Instructions:

1. **This Question Paper has 5 Sections A-E.**
2. **Section A has 20 MCQs carrying 1 mark each**
3. **Section B has 5 questions carrying 02 marks each.**
4. **Section C has 6 questions carrying 03 marks each.**
5. **Section D has 4 questions carrying 05 marks each.**
6. **Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.**
7. **All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E**
8. **Draw neat figures wherever required. Take π =22/7 wherever required if not stated.**

SECTION – A

1.	**If one zero of the quadratic polynomial $x^2+ 3x + k$ is 2, then the value of k is** **(a) 10 (b)-10 (c) -7 (d)2**	1
2.	**The number3^{13} -3^{10} is divisible by** **(a) 2 and 3 (b) 3 and 10 (c) 2, 3 and 10 (d) 2, 3 and 13**	1
3.	**LCM of two numbers is 2400. Which of the following cannot be their HCF** **(a) 300 (b)400 (c) 500 (d) 600**	1
4.	**If x = a and y = b is the solution of the equations x- y = 2 and x+ y = 4, then the values of a and b are, respectively** **(a) 3 and 5 (b) 5 and 3 (c) 3 and 1 (d) - 1 and 3**	1
5.	**The quadratic equation $x^2 + x - 5 = 0$ has** **(a) two distinct real roots (b) two equal real roots (c) no real roots** **(d) more than 2 real roots**	1

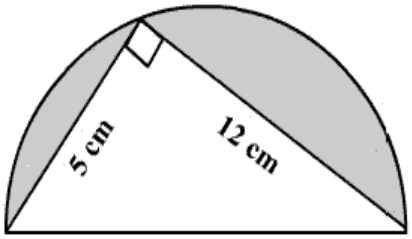
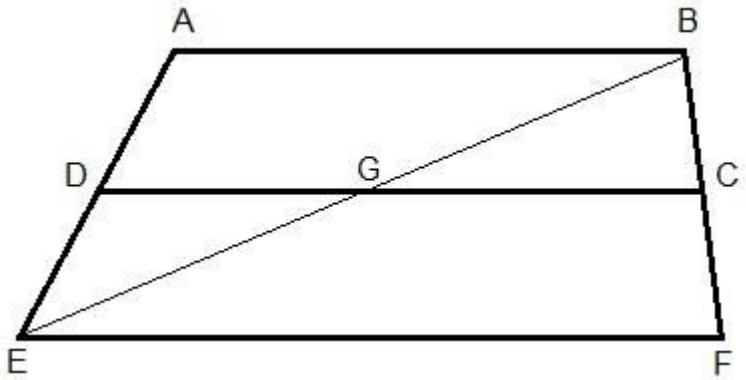
6.	**C is the mid-point of PQ, if P is (4 ,x) C is (y ,- 1) and Q is (- 2 ,4) then x and y respectively are** **(a) -6 and 1** **(b) -6 and 2** **(c) 6 and -1** **(d) 6 and -2**	1
7.	**If sin α = $\frac{1}{2}$ and cosβ = $\frac{1}{2}$ then the value of α+ β is** **(a) 0°** **(b) 30°** **(c) 60°** **(d) 90°**	1
8.	**(Sin 30°+cos 60°)-(sin 60° + cos 30°) is equal to:** **(a) 0** **(b) 1+2√3** **(c) 1-√3** **(d) 1+√3**	1
9.	**If ΔABC is right angled at C, then the value of cos(A+B) is** **(a) 0** **(b) 1** **(c) 1/2** **(d) √3/2**	1
10.	**A chord of a circle of radius 10 cm, subtends a right angle at its centre. The length of the chord (in cm) is** **(a) $\frac{5}{\sqrt{2}}$ (b) 5 $\sqrt{2}$ (c) 10 $\sqrt{2}$ (d) 10$\sqrt{3}$**	1
11.	**In a triangle ABC, DE II BC, find the value of x . AD=x, BD= X+1 ,AE= x+3 ,CE=x+5** 	1

<table>
<tr><td></td><td>(a) 2 (b) 5 (c) 10 (d) 3</td><td></td></tr>
<tr><td>12.</td><td>Which of the following statement is false?
(a) All isosceles triangles are similar. (b) All quadrilateral are similar.
(c) All circles are similar.
(d) None of the above</td><td>1</td></tr>
<tr><td>13.</td><td>Find the area of circle that can be inscribed in a square of side 10 cm.
(a) 25π sq cm (b) 50π sq cm (c) 25 sq cm
(d) 50 sq cm</td><td>1</td></tr>
<tr><td>14.</td><td>The region enclosed by an arc and a chord is called
(a) A sector(b) A segment (c) A semi -circle (d) diameter</td><td>1</td></tr>
<tr><td>15.</td><td>During conversion of a solid from one shape to another, the volume of the new shape will
(a) increase (b) decrease (c) remain unaltered (d) be doubled</td><td>1</td></tr>
<tr><td>16.</td><td>Consider the following frequency distribution of the heights of 60 students of a class Height (in cm)
<table>
<tr><td>Height in CM</td><td>150-155</td><td>155-160</td><td>160-165</td><td>165-170</td><td>170-175</td><td>175-180</td></tr>
<tr><td>NO. of students</td><td>15</td><td>13</td><td>10</td><td>8</td><td>9</td><td>5</td></tr>
</table>
The upper limit of the median class in the given data is
(a) 165 (b) 155 (c) 160 (d) 170</td><td>1</td></tr>
<tr><td>17.</td><td>If median is 137 and mean is 137.05, then the value of mode is
(a) 156.90 (b) 136.90 (c) 186.90 (d) 206.90</td><td>1</td></tr>
<tr><td>18.</td><td>The probability that a number selected at random from the numbers 1, 2, 3, ..., 15 is a multiple of 3 is
(a)$\frac{2}{15}$ (b) $\frac{1}{5}$ (c) $\frac{1}{15}$ (d) $\frac{1}{3}$</td><td>1</td></tr>
<tr><td>19.</td><td>DIRECTION: In the question number 19 and 20, a statement of Assertion</td><td>1</td></tr>
</table>

	is followed by a statement of Reason . Choose the correct option **19. Assertion : The HCF of two numbers is 5 and their product is 150, then their LCM is 30** **Reason : For any two positive integers a and b, HCF (a,b) X LCM (a,b) = a x b .** **(a) Both assertion and reason are true and reason is the correct explanation of assertion** **(b) Both assertion and reason are true but reason is not the correct explanation of assertion .** **(c) Assertion is true but reason is false.** **(d) Assertion is false but reason is true**	
20.	**Assertion :The distance point P(2,3) from the x-axis is 3.** **Reason: The distance from x-axis is equal to its ordinate** **a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion** **b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.** **c.) assertion is true but the reason is false.** **d.) both assertion and reason are false**	1

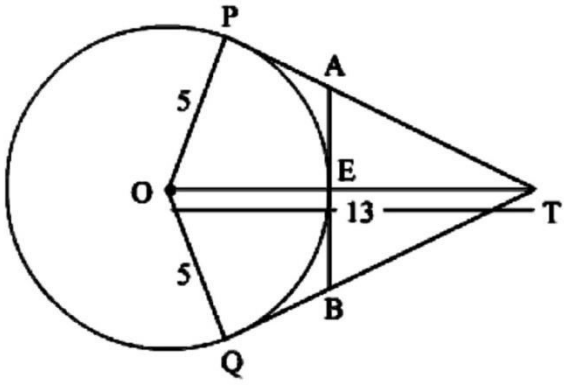
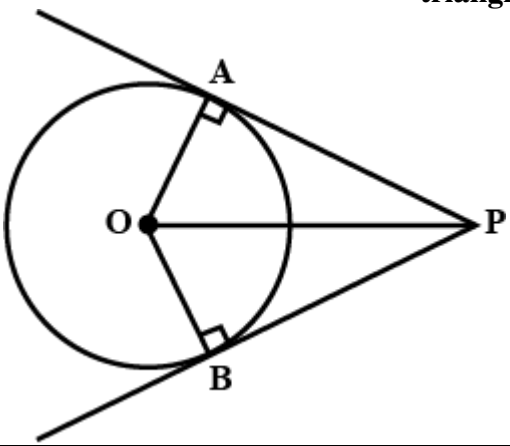
SECTION – B

21	**The combined ages of two people is 34 .If one person is 6 year younger than the other, then find their ages**	**2**
22.	**Find the value of cos2θ , if 2sin2θ = $\sqrt{3}$** **OR** **Evaluate :** $\frac{Cos\,45°}{Sec30°} + \frac{1}{Sec60°}$	**2**
23.	**Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.**	**2**
24.	**Find the area of shaded region**	**2**

	 **OR** **The length of minute hand of a clock is 14 cm . F ind the area swept by the minute hand in 5 min .**	
25.	**ABCD is a trapezium with AB I I DC . E and F are points on non parallel sides AD and BC respectively such that EF is parallel to AB .Show that $\frac{AE}{ED} = \frac{BF}{FC}$.** 	**2**

SECTION – C

26.	**Prove that $\sqrt{5} + \sqrt{3}$ is an irrational number.**	**3**
27.	**Find the zeroes of the quadratic polynomial $x^2 - 3$ and verify the relationship between the zeroes and the coefficients.**	**3**
28.	**In an election contested between A and B, A obtained votes equal to twice the no. of persons on the electoral roll who did not cast their votes and this later number was equal to twice his majority over B. If there were 1,8000 persons on the electoral roll. How many votes for B.** **OR** **Draw the graphs of the pair of linear equations : x +2y = 5 and 2x -3y − =− 4 Also find the points where the lines meet the x -axis.**	**3**

29.	**Prove that:** **Prove that** $\sqrt{\frac{1+\sin x}{1-\sin x}} = \sec x + \tan x$ **Or** $\frac{\cos A}{1-\tan A} + \frac{\sin A}{1-\cot A}$ **= sin A + cos A**	**3**
30.	**In the below figure, O is the centre of a circle of radius 5cm.T is a point such that OT=13cm and OT intersects circle at E. If AB is a tangent to the circle at E, find the length of AB, where TP and TQ are two tangents to the circle.**  **OR** **In the given figure, OP is equal to the diameter of a circle with centre O and PA and PB are tangents. Prove that ABP is an equilateral triangle.**  	**3**
31.	**All red face cards are removed from a pack of playing cards. The remaining cards are well shuffled and then a card is drawn at random from them. Find the probability that the drawn card is :** **(i) a red card** **(ii) a face card** **(iii) a card of**	**3**

SECTION - D

<table>
<tr><td>32.</td><td>An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Bangalore (without taking into consideration the time they stop at intermediate stations). If the average speed of the express train is 11km/h more than that of the passenger train, find the average speed of the two trains.

[OR]

A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km
upstream than to return downstream to the same spot. Find the speed of the stream.</td><td>5</td></tr>
<tr><td>33.</td><td>State and prove basic proportionality theorem</td><td>5</td></tr>
<tr><td>34.</td><td>A solid is in the form of a cylinder with hemispherical end. The total height of the solid is 20 cm and the diameter of the cylinder is 7 cm. Find the total volume of the solid. (Use π =22/7)
OR
There are two identical solid cubical boxes of side 7cm. From the top face of the first cube a hemisphere of diameter equal to the side of the cube is scooped out. This hemisphere is inverted and placed on the top of the second cube’s surface to form a dome. Find

(i) the ratio of the total surface area of the two new solids formed

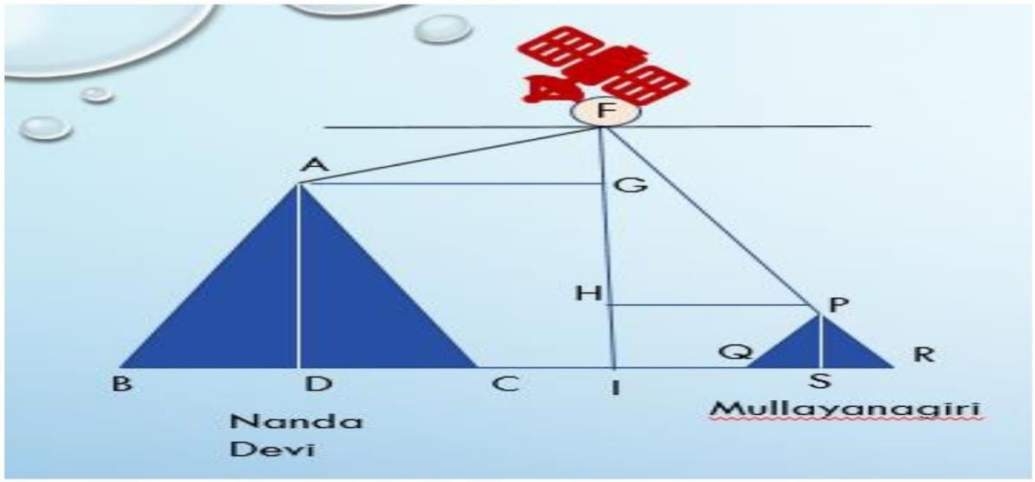
(ii) volume of each new solid formed.</td><td>5</td></tr>
<tr><td>35.</td><td>The median of the following data is 525. Find the values of x and y, if the total frequency is 100

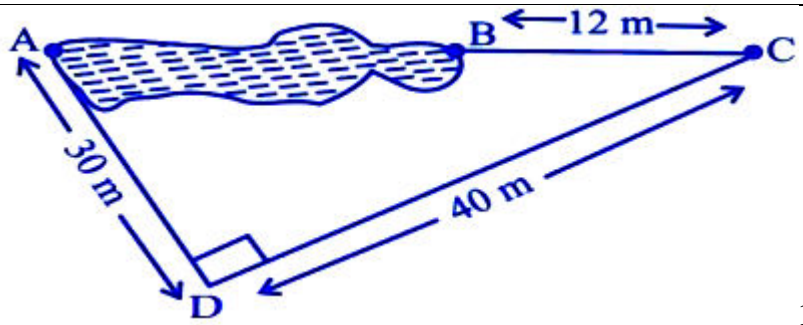
<table><tr><th>Class interval</th><th>Frequency</th></tr><tr><td>0−100</td><td>2</td></tr><tr><td>100−200</td><td>5</td></tr><tr><td>200−300</td><td>x</td></tr><tr><td>300−400</td><td>12</td></tr><tr><td>400−500</td><td>17</td></tr><tr><td>500−600</td><td>20</td></tr></table></td><td>5</td></tr>
</table>

		600−700	**y**		
		700−800	**9**		
		800−900	**7**		
		900−1000	**4**		

SECTION – E

Case study based questions are compulsory.		
36.	**Ragav wants to participate in a 200 m race .he can currently run that distance in 51 s and with each day of practice it takes him 2 s less. He wants to do in 31s**  **(i) Which of the following terms are in AP for the given situation** **ii) what is the minimum number of days he needs to practice till his goal is achieved** **iii) Which of the following term is not in the AP of the above given situation** **OR** **iii) if nth term of an AP is given by a_n = 2n+3, then commom difference of an AP is**	**(1+1+2)**
37	**A Satellite flying at height h is watching the top of the two tallest mountains in Uttarakhand and Karnataka ,them being Nanda Devi(height 7,816m) and Mullayanagiri (height 1,930 m). The angles of depression from the satellite , to the top of Nanda Devi and Mullayanagiri are 30∘∘and 60∘∘respectively. If the distance between the peaks of two mountains is 1937 km , and the satellite is vertically above the midpoint of the distance between the two mountains.**	**(1+1+2)**

	 **1.The distance of the satellite from the top of nanda devi is** **2. The distance of the satellite from the top of Mullayangiri is** **3. What is the angle of elevation if a man is standing at a distance of 7816 m form NANDA DEVI** **OR** **3. If a mile stone very far away from ,makes 45° to the top of mullayangiri mountain. So ,find the distance of this mile stone from the mountain.**	
38.	**Rohan wants to measure the distance of a pond during the visit to his native. He marks points A and B on the opposite edges of a pond as shown in the figure below. To find the distance between the points, he makes a right-angled** **triangle using rope connecting B with another point C are a distance of 12m, connecting C to point D at a distance of 40m from point C and the connecting D** **to the point A which is are a distance of 30m from D such the < ADC=90°**	

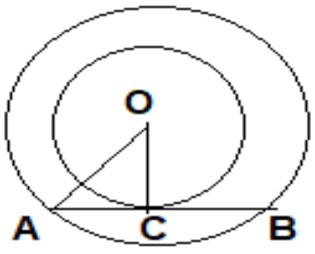
	 **1.** **1. Which property of geometry will be used to find the distance AC?** **2. What is the distance AC?** **3. Find the length AB?** **OR** **4. Find the length of the rope used.**	

KENDRIYA VIDYALAYA SANGATHAN, JAMMU REGION
SAMPLE PAPER SET- 10

CLASS – X **SUBJECT- MATHS (STD)**
TIME – 3 HOURS **M.M- 80 MARKS**

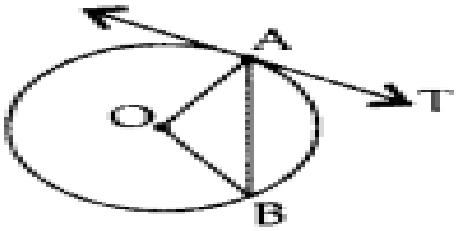
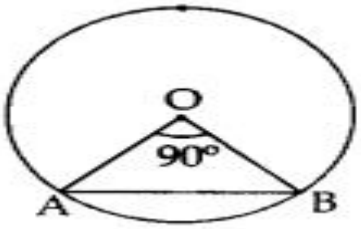
General Instructions:

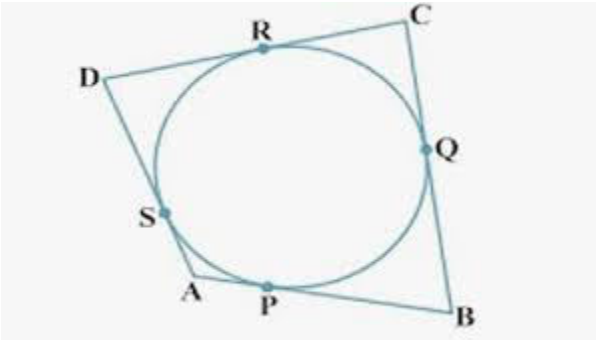
1. This Question Paper has 5 Sections A-E.
2. Section **A** has 20 MCQs carrying 1 mark each
3. Section **B** has 5 questions carrying 02 marks each.
4. Section **C** has 6 questions carrying 03 marks each.
5. Section **D** has 4 questions carrying 05 marks each.
6. Section **E** has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

	SECTION A	
	Section A consist of 20 questions of 1 mark each.	
Q.No.		**Marks**
1	In the fig. two concentric circles of radii a and b ($a > b$) are given. The chord AB of larger circle touches the smaller circle at C. Find the length of AB.  (a) $2\sqrt{b^2-a^2}$ (b) $2\sqrt{a^2-b^2}$ (c) $2\sqrt{a^2-2b^2}$ (d) $2\sqrt{2a^2-b^2}$	**1**
2	Equation of $(x+1)^2-x^2=0$ has number of real roots equal to**:** (a) 1(b) 2(c) 3(d) 4	**1**
3	If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is (a) 10(b) -10(c) 5(d) -5	**1**

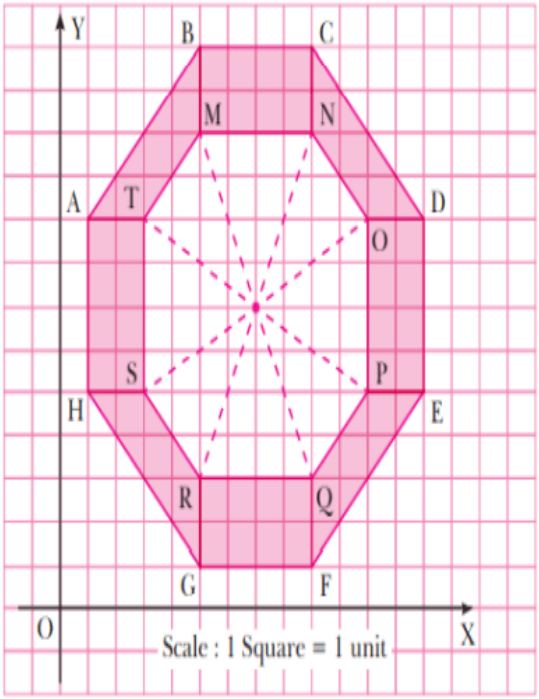
4	If the system of equations 3x+y =1 and (2k-1)x +(k-1)y =2k+1 is inconsistent, then k = (a) -1(b) 0(c) 1(d) 2	**1**
5	The distance of the point (α, β) from the origin is (a) α + β(b) $\alpha^2 + \beta^2$(c) $\lvert\alpha\rvert + \lvert\beta\rvert$(d) NONE OF THE ABOVE	**1**
6	A cylinder and a cone are of same base radius and of same height. The ratio of the volume of the cylinder to that of the cone is (a) 2 : 1(b) 3 : 1(c) 2 : 3(d) 3 : 2	**1**
7	The value of the expression $\sin^6\theta + \cos^6\theta + 3\sin^2\theta\cos^2\theta$ is (a) 0(b) 3(c) 2(d) 1	**1**
8	**If** Sin 30°+cos 60°)-(sin 60° + cos 30°) is equal to: (a) 0(b) 1+2√3(c) 1-√3(d) 1+√3	**1**
9	If in two triangles ABC and DEF, $\frac{AB}{DF}=\frac{BC}{FE}=\frac{CA}{ED}$,then (a) ΔABC ~ ΔDEF(b) ΔABC ~ ΔEDF (c) ΔABC ~ ΔEFD(d) ΔABC ~ ΔDFE	**1**
10	Three numbers are in the ratio of 3 : 4 : 5 and their L.C.M. is 2400. Their H.C.F. is: (a)40 (b) 80 (c) 120 (d)200	**1**
11	A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O ata point Q so that OQ = 12 cm. Length PQ is : (a) 12 cm(b) 13 cm(c) 8.5 cm(d) √119 cm	**1**
12	LCM of the given number 'x' and 'y' where y is a multiple of 'x' is given by (a) x(b) y(c) xy(d) xy	**1**
13	The curved surface of the cylinder is 88 cm^2. The height of the cylinder is 5 m, what is the radius of the cylinder? (a) 6 cm (b) 0.48 cm (c) 1 cm (d) 0.028 cm	**1**
14	Mode and mean of a data are 12k and 15k.Median of the data is (a) 12k(b) 14k(c) 15k(d) 16k**.**	**1**
15	The perimeter of a sector of radius 5.2 cm is 16.4 cm, the area of the sector is (a) 31.2 cm^2(b) 15 cm^2(c) 15.6 cm^2(d) 16.6 cm^2	**1**
16	For the following distribution :	**1**

	<table><tr><td>C.I.</td><td>f</td></tr><tr><td>0-5</td><td>10</td></tr><tr><td>5-10</td><td>15</td></tr><tr><td>10-15</td><td>12</td></tr><tr><td>15-20</td><td>20</td></tr><tr><td>20-25</td><td>9</td></tr></table> the difference of the upper limit of the median class and the lower limit of the modal class is (a) 0(b) 5(c) 10(d) -5	
17	If two dice are thrown together, what is the probability of getting an even number on one die and an odd number on the other die? (a)1/4(b)3/5(c)3/4(d)1/2	**1**
18	If cos X = a/b, then sin X is equal to : (a)$(b^2-a^2)/b$(b) (b-a)/b (c) $\sqrt{(b^2-a^2)}/b$(d) $\sqrt{(b-a)}/b$	**1**
19	**DIRECTION:** In the question number 19 and 20, a statement of A**ssertion (A)** is followed by a statement of **Reason (R)**. Choose the correct option **Statement AAssertion:** The H.C.F. of two numbers is 16 and their product is 3072. Then their L.C.M. = 162. **Statement RReason:**If a and b are two positive integers, then H.C.F. × L.C.M.= a × b. a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason(R) is false. (c) Assertion (A) is true but reason(R) is false. (d) Assertion (A) is false but reason(R) is true	**1**
20	**Statement AAssertion:** C is the mid-point of PQ, if P is (4, x), C is (y,- 1) and Q is (-2, 4), then x and y respectively are -6 and 1. **Statement RReason:**The mid-point of the line segment joining the points P(x_1 , y_1) and Q(x_2 , y_2) is$\left(\frac{x_1+x_2}{2} , \frac{y_1+y_2}{2}\right)$	**1**

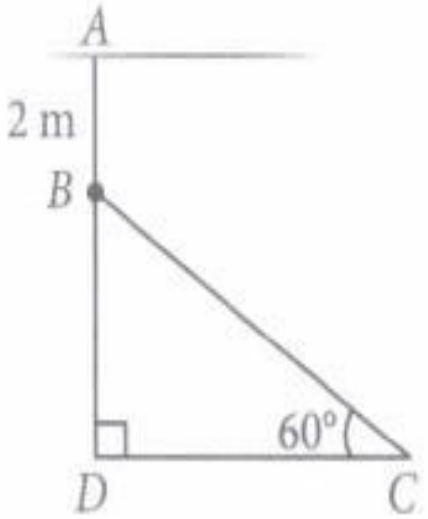
	a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) $\frac{x}{2}+\frac{2}{3}$ y = -1 and x – $\frac{1}{3}$ y = 3(c) Assertion (A) is true but reason(R) is false. (d) Assertion (A) is false but reason(R) is true	
	SECTION B	
	Section B consists of 5 questions of 2 marks each.	
21	solve for x and y by elimination method.	**2**
22	If a line intersects sides AB and AC of a triangle ABC at D and E, respectivelyand is parallel to BC, prove that AD/AB = AE/AC.	**2**
23	In the given figure, O is the centre of a circle, AB is a chord and AT is the tangent at A. If ∠AOB = 100°, then calculate ∠BAT.  	**2**
24	Find the area of the major segment APB, in the figure of a circle of radius 35 cm and ∠AOB = 90°. (Use π = 22/7)  **OR** The length of the minute hand of a clock is 14 cm. Find the area swept by the minutehand in 5 minutes.	**2**
25	If tan(A+B) =1 and tan(A-B)= √3, 0°< A+B ≤ 90° and A> B, then find the measures of angles A and B. **OR** Find an acute angle θ when $\frac{\cos\theta-\sin\theta}{\cos\theta+\sin\theta}=\frac{1-\sqrt{3}}{1+\sqrt{3}}$	**2**

	SECTION C	
	Section C consists of 6 questions of 3 marks each.	
26	Given that $\sqrt{2}$ is irrational, prove that $3+5\sqrt{2}$ is irrational.	**3**
27	α and β are the zeroes of the polynomial $6y^2 - 7y + 2$, find a quadratic polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$	**3**
28	**A** train travelled 240 km at a certain speed. When the engine was replaced by an improved model, the speed was increased by 20 km/hr and the travel time for the trip was decreased by 1 hr. What was the rate of each engine? **OR** The product of the ages of Cally and Katty is 130 less than the product of their ages in 5 years. If Cally is 3 years older than Katty, what are their current ages?	**3**
29	**Prove that:** $\frac{\cos\theta}{(1-\tan\theta)} + \frac{\sin\theta}{(1-\cot\theta)} = \sin\theta + \cos\theta$	**3**
30	**A** quadrilateral ABCD is drawn to circumscribe a circle as shown in the figure.  Prove that AB + CD = AD+BC **OR** Let s denote the semi-perimeter of a triangle ABC in which BC = a, CA = b, AB = c. If a circle touches the sides BC,CA, AB at D, E, F, respectively, prove that BD = s – b.	**3**
31	One card is drawn at random from a well-shuffled deck of 52 playing cards. Find the probability that the card drawn is (i) either a red card or a king, (ii) (ii) neither a red card nor a queen.	**3**
	SECTION D	
	Section D consists of 4 questions of 5 marks each.	
32	Aryan covers a distance of 1 km from A to B. While returning, his speed is 3 km/hr more than first half of the journey. The total time taken for the journey is 0.5hr. Find the speed for the first half and second half of the journey. **OR**	**5**

<table>
<tr><td></td><td>The area of a rectangle is 84 sq units and the longer side is 5 units more than the shorter side. Find the length of both sides</td><td></td></tr>
<tr><td>33</td><td>ABCD is a trapezium with AB ∥ DC in which diagonals AC and BD intersect at E and ΔAED~ΔBEC. Prove that AD = BC.</td><td>5</td></tr>
<tr><td>34</td><td>Due to heavy floods in a state, thousands were rendered homeless. 50 schools collectively decided to provide place and the canvas for 1500 tents and share the whole expenditure equally. The lower part of each tent is cylindrical with base radius 2.8 m and height 3.5 m and the upper part is conical with the same base radius, but of height 2.1 m. If the canvas used to make the tents costs Rs. 120 per m^2 ,find the amount shared by each school to set up the tents.
OR
There are two identical solid cubical boxes of side 7cm. From the top face of the first cube a hemisphere of diameter equal to the side of the cube is scooped out. This hemisphere is inverted and placed on the top of the second cube's surface to form a dome. Find
(i) the ratio of the total surface area of the two new solids formed
(ii) volume of each new solid formed</td><td>5</td></tr>
<tr><td>35</td><td>The median and the mode of the following wage distribution are as Rs 33.5 and Rs 34 resp. Three frequency values are missing. Find the missing frequencies.
<table>
<tr><th>Wages</th><th>No. of persons</th></tr>
<tr><td>0-10</td><td>4</td></tr>
<tr><td>10-20</td><td>16</td></tr>
<tr><td>20-30</td><td>x</td></tr>
<tr><td>30-40</td><td>y</td></tr>
<tr><td>40-50</td><td>z</td></tr>
<tr><td>50-60</td><td>6</td></tr>
<tr><td>60-70</td><td>4</td></tr>
<tr><td>total</td><td>230</td></tr>
</table></td><td>5</td></tr>
<tr><td></td><td>SECTION E</td><td></td></tr>
<tr><td></td><td>Case study based questions are compulsory. Each question carry 4 marks</td><td></td></tr>
<tr><td>36</td><td>Octagonal kitchen tables come with an incredible shape that's perfect for small, cozy living spaces. They create an intimate ambiance better than any other table shape. In</td><td></td></tr>
</table>

	anyone's home, a busy place is usually the dining or kitchen area. The top of a table is shown in the figure given below:   Based on the above information, answer the following questions. i) The coordinates of the points H and G are respectively ii) If G is taken as the origin, and x, y axis put along GF and GB, then the point denoted by coordinate (4, 2) is **OR** The distance between the points A and B is iii) The coordinates of the mid point of line segment joining points M and Q are	**1** **2** **1**
37	In a class the teacher asks every student to write an example of A.P. Two friends Geeta and Madhuri writes their progressions as -5, -2, 1,4, ... and 187, 184, 181, ... respectively. Now, the teacher asks various students of the class the following questions on these two progressions.	

	 Based on the above information, help students to find the answers of the following questions. i) Find the 34^{th} term of the progression written by Madhuri. **1** ii) Find the sum of common difference of the two progressions. **2** **OR** Find the 19^{th} term of the progression written by Geeta. **1** iii) Which term of the two progressions will have the same value?	
38	Electricians are responsible for inspecting, testing, repairing, installing, and modifying electrical components and systems. Electricians general work at homes, businesses, and construction sites, and generally work as contractors. An electrician has to repair an electric fault on the pole of height of8 m. He needs to reach a point 2 m below the top of the pole to undertake the repair work.	



1

Based on the above information, answer the following questions.

i) Length of BD is ? **2**

ii) What should be the length of ladder, so that it makes an angle of 60° with the ground? **1**

OR

The distance between the foot of ladder and pole is?

iii) What will be the measure of ∠BCD when BD and CD are equal?

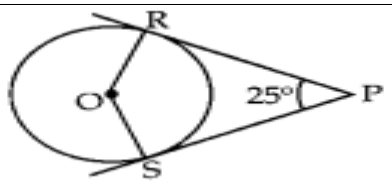
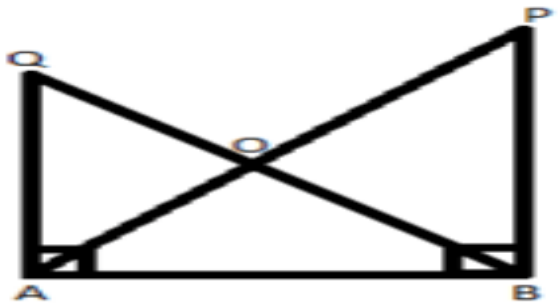
KENDRIYA VIDYALAYA SANGATHAN, JAMMU REGION
SAMPLE PAPER SET- 11

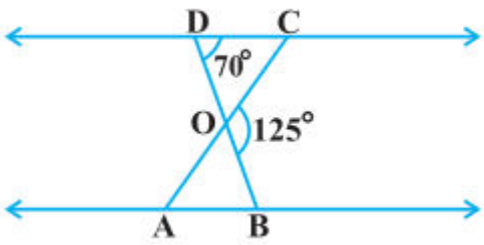
CLASS – X **SUBJECT- MATHS (STD)**
TIME – 3 HOURS **M.M- 80 MARKS**

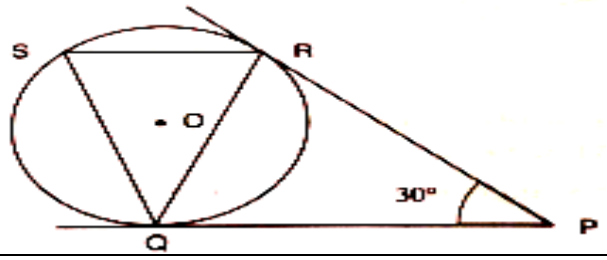
General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section **A** has 20 MCQs carrying 1 mark each
3. Section **B** has 5 questions carrying 02 marks each.
4. Section **C** has 6 questions carrying 03 marks each.
5. Section **D** has 4 questions carrying 05 marks each.
6. Section **E** has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

	SECTION A	
	Section A consist of 20 questions of 1 mark each.	
Q. No.		**Marks**
1	The minute hand of a clock is 42cmlong.Thedistance covered by the tip of the minute hand from 10:10 am to 10:25 am is a) 44 cm b) 88cm c) 132cm d) 176cm	**1**
2	? and ½ are the zeroes of px^2+5x+r, then a) p=r=2 b) p=r=-2 c) p= 2,r = -2 d) p=-2,r=2	**1**
3	The probability of an event that is sure to happen , is a) 1 b) 1/3 c) 0 d)1/2	**1**
4	The roots of the equation $x^2+x-p(p+1)=0$ are a) p,p+1 b) -p,p+1 c) p,-(p+1) d) -p,-(p+1)s	**1**
5	The distance of the point P(2,3) from the x-axis is: a) 2 b)3 c) 1 d)5	**1**
6	The value of k for which the lines 5x+7y=3 and 15x+21y=k coincide is a) 9 b) 5 c) 7 d) 18	**1**
7	AOBC is a rectangle whose three vertices are A(0,-3),O(0,0) and B(4,0). The length of the diagonal is ? a) 3cm b) 5cm c) 4 cm d) 2cm	**1**
8	The value of A , for $\sin 2A=1$, where $0^o<A<90^o$ is a) 30^o b) 60^o c) 45^o d) 135^o	**1**
9	In the given figure, if $\angle RPS = 25°$, the value of <ROS is	**1**

	 (a) 135°(b) 145°(c) 165°(d) 155º	
10	What is the greatest possible speed at which a girl can walk 95 m and 171 m in an exact number of minutes? a) 17 m/min b) 19 m/min c) 23m/min d) 13m/min	**1**
11	The radius of the largest right circular cone that can be cut out from a cube of edge 4.2 cm is : a) 4.2 b) 2.1 c) 8.4 d) 1.05	**1**
12	The mean and median of the data are 20 and 22 respectively. The value of the mode is : a) 20 b) 26 c) 22 d) 21	**1**
13	The arithmetic mean of first n natural number is a) n b) n+1 c) (n+1)/2 d) n(n+1)/2	**1**
14	If at some time, the length of the shadow of a tower is √3 times its height, then the angle of elevation of the sun, at that time is: (a) 15°(b) 30°(c) 45°(d) 60º	**1**
15	In the figure, PB and QA are perpendicular to segment AB. If OA = 5 cm, PO = 7cm and area (ΔQOA) = 150 cm^2, find the area of ΔPOB.  (a) 233 cm^2(b) 294 cm^2(c) 300 cm^2(d) 420 cm^2	**1**
16	If the radius of the base of a right circular cylinder is halved , keeping the height same, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is : a) 1:2 b) 2:1 c) 1:4 d) 4:1	**1**
17	The ratio of LCM and HCF of the least composite and the least prime numbers is a) 1:2 b) 2:1 c) 1:1 d) 1:3	**1**
18	AB is a chord of the circle and AOC is its diameter such that angle ACB = 50°. If AT is the tangent to the circle at the point A, then ∠BAT is equal to a) 65° b) 60° c) 50° d) 40°	**1**

19	**DIRECTION:** In the question number 19 and 20, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**. Choose the correct option **Assertion(A)** :The value of tan A is always less than 1. **Reason (R):** tan A= 1/ cotAsinA a) Both Assertion (A) and Reason(R) are correct statements and reason(R) is the correct explanation of the assertion (A). b) Both Assertion (A) and Reason(R) are correct statements, but Reason(R) is not the correct explanation of the Assertion (A). c) Assertion (A) is correct, Reason (R) is wrong statement. d) Both Assertion (A) and Reason (R) are wrong statements.	**1**
20	**Assertion:** A number N when divided by 15 gives the remainder 2. Then the remainder is same when N is divided by 5. **Reason:** √3 is an irrational number. a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason(R) is false. (c) Assertion (A) is true but reason(R) is false. (d) Assertion (A) is false but reason(R) is true	**1**
	Section B	
	Section B consists of 5 questions of 2 marks each.	
21	Find the sum of $(1-\frac{1}{n})+(1-\frac{2}{n})+(1-\frac{3}{n})$ ……. upto n terms.	**2**
22	cot θ = 7/8, evaluate : (1 + sin θ)(1 – sin θ)/(1+cos θ)(1-cos θ) ii) $\cot^2\theta$	**2**
23	The length of a tangent from a point A at distance 5 cm from the centreof the circle is 4 cm. Find the radius of the circle. **OR** Two concentric circle are of radii 5cm and 3cm find the length of the chord of the larger circle which touches the smaller circle.	**2**
24	In figure, ΔODC ~ ΔOBA, ∠ BOC = 125° and ∠ CDO = 70°. Find ∠ DOC, ∠DCO and ∠OAB.  	**2**

25	The wheels of a car are of diameter 80 cm each. How many complete revolutions does each wheel make in 10 minutes when the car is travelling at a speed of 66 km per hour OR The length of the minute hand of a clock is 14cm. Find the area swept by the minute hand in 5 minutes.	**2**
	SECTION C	
	Section C consists of 6 questions of 3 marks each.	
26	Prove the identity,where the angles involved are acute angles for which theexpressions are defined. (i) $(\text{cosec}\ \theta - \cot\theta)^2 = (1-\cos\theta)/(1+\cos\theta)$	**3**
27	In a game of musical chair, the person playing music has been advised to stop playing the music at any time within 1 minute after she starts playing. What is the probability that the music will stop within the first 20 sec.after starting?	**3**
28	If a hexagon ABCDEF circumscribe a circle. Prove that : **AB + CD + EF = BC + DE + FA.** **OR** In the fig. tangents PQ and PR are drawn to circle such that ∠RPQ = 30°. A chord RS is drawn parallel to the tangent PQ. Find ∠RQS.  	**3**
29	Prove that $\sqrt{5}-3$ is irrational.	**3**
30	A thief runs with a uniform speed of 100m/min. After one minute,a police runs after the thief to catch him. He goes with a speed of 100m/min in the first minute and increases his speed by 10 m/min every succeeding minute. After how many minutes the policeman will catch the thief? **OR** A passenger, while boarding the plane, slipped from the stairs and got hurt. The pilot took the passenger in the emergency clinic at the airport for treatment. Due to this, the plane got delayed by half an hour. To reach the destination 1500km away in time, so that the passengers could catch the connecting flight, the speed of the plane was increased by 250km/hour than the usual speed. Find the usual speed of the plane.	**3**
31	If a and b are the zeroes of the quadratic polynomial $f(x)=x^2-x-2$, find a polynomial where zeroes are (2a-1) and (2b-1)	**3**

	SECTION D	
	Section D consists of 4 questions of 5 marks each.	
32	The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is ₹ 18. Find the missing frequency f. Also find its Mode and Median Daily pocket allowances (in ₹) / No. of children 11 – 13 : 7 13 – 15 : 6 15 – 17 : 9 17 – 19 : 13 19 – 21 : f 21 – 23 : 5 23 – 25 : 4	**5**
33	Two dairy owners A and B sell flavouredmilk filled to capacity in mugs of negligible thickness, which are cylindrical in shape with a raised hemispherical bottom. The mugs are 14cm high and have diameter of 7cm as shown in given figure. Both A and B self flavoured milk at the rate of Rs 80per litre. The dairy owner A uses the formula $\pi r^2 h$ to find the volume of milk in the mug and charges Rs 43.12 for it. The dairy owner B is of the view that the price of actual quantity of milk should be charged. What according to him should be the price of one mug of milk?(use π= 22/7) **OR** A farmer connects a pipe of internal diameter 25cm from a canal into a cylindrical tank in his field, which is 12m in diameter and 2.5m deep. If water flows through the pipe at the rate of 3.6km/h, in how much time will the tank be filled? Also find the cost of water, if the canal department charges at the rate Rs 0.07/m^3.(use π=22/7)	**5**
34	The difference of the squares of two numbers is 180. The square of the smaller number is 8 times the greater number. Find the two numbers. **OR** A Train travels 180 km at a uniform speed. If the speed had been 9 km/hour more, it would have taken 1 hour less for same journey. Find the speed of the train.	**5**
35	ABCD is a parallelogram. AB is divided at P and CD at Q so that AP:PB=3:2 and CQ:QD=4:1. If PQ meets AC at R, then prove that AR=$\frac{3}{7}AC$	**5**
	SECTION E	
	Case study based questions are compulsory. Each question carry 4 marks	
36	Sales goals are the objectives a company or a team wants to achieve in a given time. It gives sales teams a roadmap of what they need to do to help their company achieve specific targets.	

	At the time that I was newly hired, 100 sales per month was what I required. Each following month the last plus 20 more, as I work for the goals of top sales award. When 2500 sales are thusly made, I got a holiday package  i) How many sales were made by this person in the seventh month? (1 mark) ii) What were the total sales after the 12 thmonth? **OR** After how many month will be the sale 2500 ? iii) Was the 2500 total sales met after the 12^{th} month?	**1** **2** **1**
37	When an eagle looks at a rat on the ground, eagle does not attack the rat at its initial position. It takes into account the speed of the rat and the direction in which rat is moving. After analysing the situation (how? It may be God's gift) eagle attacks the rats 	

	in such a way that it may successful in catching the rat. Suppose an eagle sitting on the tree of height 90m, observe a rat with angle of depression 45º, and moving away from the tree with some speed. Eagle start flying 30º downward and catch rat in 10 second i) What is the horizontal distance between tree and initial position of rat? ii) What is the distance travelled by rat in 10 seconds? **OR** What is the distance travelled by eagle to catch rat? iii) What is the speed of eagle?	**1** **2** **1**
38	Rehan lives in Meghalaya. Satellite image of his colony is shown in given figure . In this view, his house is pointed out by a flag, which is situated at the point of intersection of x and y-axis. If he goes 2cm east and 3 cm north from the house ,then he reaches a grocery store, if he goes 4cm west and 6 cm south from the house, then he reaches to his office. If he goes 6cm east and 8cm south from the house then he reaches to a food court. If he goes 6cm west and 8cm north from the house , he reaches to his kid's school  i) Find the distance between grocery store and food court? ii) If the grocery store and office lie on a line, what is the ratio of distance of house from grocery store to that from office? **OR** What shape is formed by the coordinates of positions of school l, grocery store, food court and office? iii) Find the ratio of distance of house from school to food court?	**1** **2** **1**

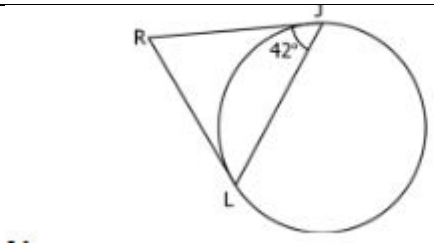
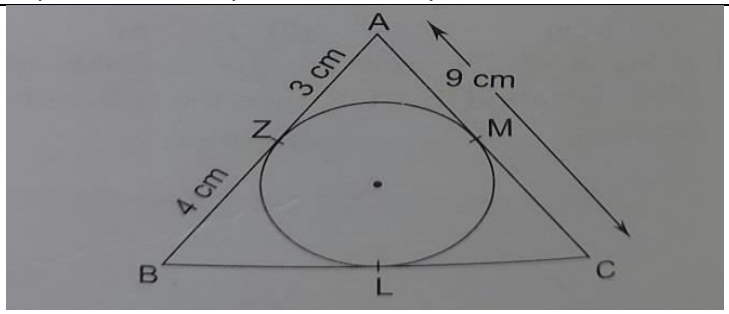
KENDRIYA VIDYALAYA SANGATHAN, JAMMU REGION
SAMPLE PAPER SET- 12

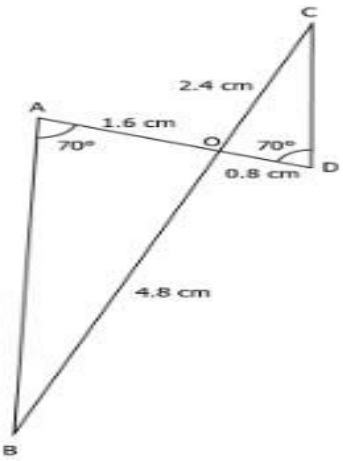
CLASS – X **SUBJECT- MATHS (STD)**
TIME – 3 HOURS **M.M- 80 MARKS**

General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section **A** has 20 MCQs carrying 1 mark each
3. Section **B** has 5 questions carrying 02 marks each.
4. Section **C** has 6 questions carrying 03 marks each.
5. Section **D** has 4 questions carrying 05 marks each.
6. Section **E** has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

	SECTION A	
	Section A consist of 20 questions of 1 mark each.	
Q. No.		**Marks**
1	Three bulbs red,green and yellow flash at an interval of 80 seconds,90 seconds and 110 seconds.All three flash together at 8:00am.At what time will the three bulbs flash altogether again? a) 9:00amb) 9:12am c) 10:00am d) 10:12 am	**1**
2	The numbers of zeroes in the end of a number whose prime factorization is $2^2 \times 5^3 \times 3^2 \times 17$ is a) 1 b) 2 c) 3 d) 4	**1**
3	Which of the following statements is not true :- a) For any two positive integers a and b HCF(a ,b)×LCM(a, b) = a × b . b) For any three positive integers p ,q and r HCF (p, q, r) × LCM (p, q , r)= p ×q× r . c) Let p be a prime number . If p divides a^2,then p divides a ,where a is apositive integer. d) Every composite number can be factorized as a product of primes ,and this factorization is unique ,apart from the order in which the prime factors occurs.	**1**
4	Given that m + 2 ,where m is a positive integer ,is a zero of the polynomial $p(x) = x^2 - mx - 6$ .which of these is the value of m? a) 1b) 2 c) 3 d) 4	**1**
5	In the equations shown below, a and b are unknown constants.	**1**

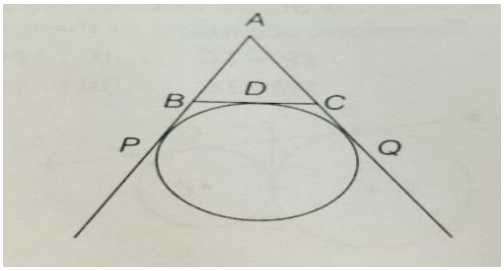
	3ax + 4y = -2 2x + by = 14 If (-3 ,4) is the solution of the given equations , what are the values of a and b ? a) The value of a= -2 b = 5 b) The value of a =5 ,b =2 c) The value of a =5 and b = -2 d) The value of a=2 ,b =5	
6	The value of $\frac{4-sin^2 45}{\cot k \tan 60}$ is 3.5 . what is the value of k ? a)30° b)60° c)45° d) 90°	**1**
7	If $\sin\theta = \frac{7}{\sqrt{85}}$,what are the values of $\tan\theta$ *and* $\cos\theta$? a) $\tan\theta = \frac{7}{6}, \cos\theta = \frac{6}{\sqrt{85}}$ b) $\tan\theta = \frac{6}{7}, \cos\theta = \frac{7}{\sqrt{85}}$ c) $\tan\theta = \frac{7}{6}, , \cos\theta = \frac{7}{\sqrt{85}}$ d) $\tan\theta = \frac{6}{7}, \cos\theta = \frac{6}{\sqrt{85}}$	**1**
8	The points (4 , 0), (-4 , 0) and (0 ,3) are the vertices of a : a) Right triangleb) Isosceles triangle b) Equilateral triangle d)Scalene triangle	**1**
9	Point P divides the line segment joining R(-1 ,3) and S(9,8) in the ratio k:1.If P lies on the line x –y +2 =0,then the value of k is : a) $\frac{2}{3}$ $b)\ \frac{1}{2}$ $c)\ \frac{1}{3}$ $d)\ \frac{1}{4}$	**1**
10	 In the figure shown ,RJ and RL tangents of the circle.What is the measure of angle < JRL ? a) 48° $b)$ 6° $c)$ 96° $d)$ 138°	**1**
11	 In the above fig.,triangle ABC is circumscribing acircle.Then the length of BC is :	**1**

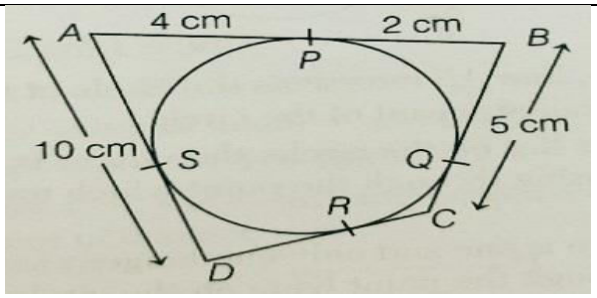
	a) 7 cm b) 8 cm c) 9 cm d) 10 cm	
12	Observe the two triangles shown below :  Which statement is correct ? a) Triangles are similar by SAS b) Triangles are similar by SSA c) Triangles are not similar as sides are not in proportion. d) No conclusion about similarity of triangles can be made as angle measures are not known.	**1**
13	Area of a sector of angle p (in degrees)of a circle with radius R is : a) $\frac{p}{180} \times 2\pi R$ b) $\frac{p}{180} \times \pi R^2$ c) $\frac{p}{360} \times 2\pi R$ d) $\frac{p}{720} \times 2\pi R^2$	**1**
14	A solid is hemispherical at the bottom and conical above it. The surface area of the two parts are equal, then the ratio of its radius and the height of its conical part is : a) 1: 3 b)1 :$\sqrt{3}$ *c*) 1 : 1 d)1 : 7	**1**
15	If we reduce the height of a cylinder by $\frac{1}{4}$ and double the radius ,what will be the impact on the volume of cylinder? a) Volume will be doubled b) Volume remains same c) Volume will reduced to half d) Volume will increased by four times.	**1**
16	For the following distribution: Marks | Below 10 | 20 | 30 | 40 | 50 | 60 No. of Students | 3 | 12 | 27 | 57 | 75 | 80 The modal class is : a) 10 -20 b) 20 –30 c) 30 – 40 d) 50 - 60	**1**
17	A grouped data is shown below.If the median of the grouped data is 22.50 and the total frequency is 20, then what is the value of a ? 0-10 | 4 | 4 10-20 | a | 4+ a	**1**

20-30	4	8+a
30-40	b	8 +a +b
40-50	5	13 +a +b

a) 1 b) 2 c) 4 d) 5

18	Two dice are thrown at the same time .what is the probability that the sum of two numbers appearing on the top of dice is less than or equal to 12? a) $\frac{0}{36}$ b) $\frac{1}{36}$ c) $\frac{11}{36}$ d) $\frac{36}{36}$	**1**
19	**Statement A (Assertion):** if a and c are of opposite signs , then the quadratic equation ax^2 +bx + c = 0,has real and distincts roots. **Statement R (Reason) :** if discriminant D of a quadratic equation is not equal to zero , it has real and distinct roots. a) Both assertion A and reason R are true and reason R is the correct explanation of assertion A . b) Both assertion A and reason R are true but reason is not the correct explanations of assertion A . c) ASSERTION A is true but reason R is false. d) Assertion A is false but reason R is true.	**1**
20	**Statement A (Assertion)** if $\sin\theta + sin^2\theta = 1$,then $cos^2\theta + cos^4\theta = 1$ **Statement R (Reason) :** $1 - sin^2\theta = cos^2\theta$ a) Both assertion A and reason R are true and reason R is the correct explanation of assertion A . b) Both assertion A and reason R are true but reason is not the correct explanations of assertion A . c) ASSERTION A is true but reason R is false. d) Assertion A is false but reason R is true	**1**
	SECTION B	
	Section B consists of 5 questions of 2 marks each.	
21	For which value of k, the given pair of linear equations 3x+2ky – 2 = 0 and 2x+5y+1 = 0 have no solution ?	**2**
22	Find the value of x in tan 3x = sin 45°cos45° + sin 30° ,where 3x is an acute angle. **OR** Show that (sec A + tan A) (1 – sin A) = CosA	**2**
23	Find the area of the segment of a circle of radius14cm,if the length of thecorresponding arc is 22cm. **OR** If the area of a sector of a circle is $\frac{5}{18}$th of the area of that circle , then find the central	**2**

	angle of the sector.	
24	Find the perimeter of ΔABC, if AP=12 cm.  	**2**
25	The diagonals of a quadrilateral ABCD intersect each other at the point O such that $\frac{AO}{BO}=\frac{CO}{DO}$.Show that ABCD is a trapezium.	**2**
	SECTION C	
	This section has 6 questions of 3 marks each.	
26	Provethat of $3+2\sqrt{5}$ is irrational .	**3**
27	If α,β are the zeroes of the polynomial $2x^2-4x+5$, then find the value of (a) $\alpha^2+\beta^2$ (b) $(\alpha-\beta)^2$. (c) $\frac{1}{\alpha}+\frac{1}{\beta}$	**3**
28	A train covered a certain distance at a uniform speed. If the train would have been 6km/hr faster, it would havetaken 4hours less than the scheduled time. And if the train were slower by 6km/hr, it would have taken 6 hoursmore than the scheduled time. Find the distance of the journey. **OR** Students are made to stand in rows. If one student is extra in a row there would be 2 rows less. If one student isless in a row there wouldbe 3 rows more. Find the number of students in the class.	**3**
29	Prove that $(\sin A+\operatorname{cosec} A)^2+(\cos A+\sec A)^2=7+\tan^2 A+\cot^2 A$	**3**
30	A class has15 girls and 10 boys. The teacher calls on a student at random to answer a question. Express in decimal form, the probability that a student called upon is i) a girl ii) a boy iii) a pupil in the class .	**3**
31	Prove that length of tangents drawn from an external point to a circle are equal. Using this result, find the length of CD?	**3**



OR

Prove that the parallelogram circumscribing a circle is a rhombus .

SECTION D

Section D consists of 4 questions of 5 marks each.

32 Transport department of city wants to buy some electric buses for the city . For which they want to analyse the distance travelled by existing public transport buses in a day.The following data shows the distance travelled by 60 existing public transport buses in a day. **5**

Distance travelled in kms	No. of Buses
200-209	4
210-219	14
220-229	26
230-239	10
240-249	6

Based on this information , answer the following questions .

1] The upper limit of a class and lower limit of succeeding class differ by ?

2] The median lies inside which class ?

3] The cumulative frequency of the class preceding the median class is ?

4] The formula for finding median of grouped data is ?

5] The median distance travelled in km is ?

33 Answer the following questions based on similarity of the triangles : **5**

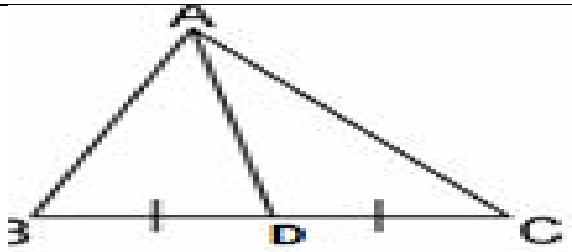
a)Define AAA similarity criterion of two triangles

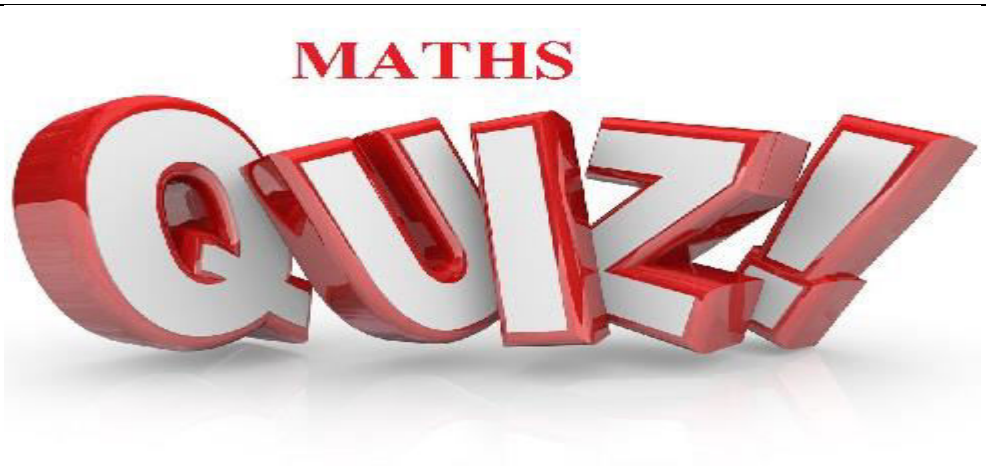
b)Two triangles are similar,is it true to say that they are congruent also ? Justify it.

c) D is a point on the side BC of triangle ABCsuch that $\angle ADC = \angle BAC$.

Prove that

$CA^2 = CB \times CD$

		
34	In the picture given below,one can see a rectangular in-ground swimming pool installed by a family in their backyard. There is a concrete sidewalk aroundthe pool of width x m.The outside edges of the sidewalk measure 7m and 12m.The area of the pool is 36 sq.m.  (a) Based on the information given above ,form a quadratic equation in terms of x (b) Find the width of the sidewalk around the pool.	**5**
35	A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.	**5**
	SECTION E	
	Case study based questions are compulsory. Each question carry 4 marks	
36	Akshat a student of class 10 participated in a school level mathematics quiz competition.On a set of a pair of perpendicular axes on a graph paper. Akshat plot the followingpoints and join them as directed by the teacher in that competition.He joins the points D(1,6) to E(1,50) to F(3,3) toG(6,3)to H(8,5) to I(8,6) to D.	

	 Based on the above information answer the following i) Plot these points on a graph paper and Find distance FI ? ii) Find the coordinates of the point P which divides the join of F(3,3) and I(8,6) in the ratio2:1 **OR** Find the ratio in which the line segment joining the points G(6,3)and H(8,5) is divided by a point R(7,4) iii) Find if the points (4,3),(5,1) ,and (1,9) are collinear?	**1** **2** **1**
37	 A girl 8m tall spots a parrot sitting on the top of a building of height 58m from the ground. The angle of elevation of the parrot from the eyes of girl at any instant is 60°. The parrot flies away horizontally in such a way that it remained at a constant height from the ground. After 8 seconds, the angle of elevation of the parrot from the same point is 30°. Based on the above information, answer the following questions: Based on the above information,answer the following questions : i) Draw a diagram to depict the above information. ii) Find the distance of first position of the parrot from the eyes of the girl. **OR**	**1** **2**

	Find the distance between the girl and the building. iii) If the distance between the position of parrot increases, what is the change in the angle of elevation. Does it increase or decrease?	**1**
38	Ram's elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of Rs. 118000 by paying every month starting with the first installment of Rs. 1000. He increases the installment by Rs. 100 every month.  Based on the above information,answer the following questions : i) Set up an A.P. based on the above information. Find the amount paid by him in the 30thinstallement ? ii) Find the amount paid by him in the 30 installements ? **OR** Find the sum of $(1-\frac{1}{n})+(1-\frac{2}{n})+(1-\frac{3}{n})$ ……. upto n terms ? iii) What amount does he still have to pay after 30thinstallment?	**1** **2** **1**

KENDRIYA VIDYALAYA SANGATHAN, JAMMU REGION

SAMPLE PAPER SET- 13

CLASS – X **SUBJECT- MATHS (STD)**

TIME – 3 HOURS **M.M- 80 MARKS**

INSTRUCTIONS:-

(i) All questions are compulsory

(ii) The question paper consist of 38 questions divided into five sections A, B ,C, D and E. section A comprises 20 MCQs of 1 mark each. Section B comprises 5 question of 2 marks each; section C comprises 6 questions of 3 marks each and Section-D comprises 4 questions of 5 marks each.

Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1,1 and 2 marks each respectively .

(iii)There is no overall choice in this question paper. However, an internal choice in 2 Qs of 5 marks, 2Qs of 3 marks and 2Qs of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E. You have to attempt only one of the alternatives in such sections.

(iv)Use of any calculating device is not permitted.

SECTION - A (20 Questions.1 mark each)

1. LCM of two numbers is 1200. Which of the following cannot be their HCF?
(A) 600 (B) 400 (C) 200 (D) 500

2. The sum of first 20 odd natural numbers is:
(A) 150 (B) 200 (C) 400 (D) 210

3. Maximum zeroes,a quadratic polynomial can has:
(A) 1 (B) 2 (C) 3 (D) 0

4. Equations 2x +3y = 5 and 4x +ky =10 has infinitely many solutions, then value of k is:
(A) 2 (B) 4 (C) 1 (D) 6

5.If cos A=4/5,then the value of tan A is
(A) 3/5 (B) 3/4 (C) 4/3 (D) 5/3

6.If cot A= $\sqrt{3}$, then $\sec^2 A - \cos^2 A$ is equal to
A) 7/12 (B) 25/12 (C) 6/12 (D) 5/12

7.If -1 is a zero of polynomial $p(x)= x^2-7x-8$ then the other zero is:
A) -8 (B) -7 (C) 1 (D) 8

8. Sin2A = 2SinA, then A= ... º:
(A) 0 (B) 30 (C) 45 (D) 60

9.Zeroes of quadratic polynomial $x^2 -5x + 6$ are:
A) -5,1 (B) 5,1 C) 2,3 (D) -2,-3

10. If a pair of linear equations is consistent, then the lines will be :
(A) parallel (B) always coincident (C) intersecting and coincident (D) always intersecting

11. The pair of equations x +2y + 5= 0 and -3x -6y + 1 =0 has:
A) a unique solution(B) exactly two solutions(C)infinitely many solutions (D) no solution.
12.In ΔABC, DE ll BC, so that AD = (7x-4)cm, AE= (5x-2)cm, DB= (3X+4)CM, and EC= 3x cm , then the value of x :
A) 1 (B) 2 (C) 3 (D) 4
13.Two concentric circles are of radii 10cm and 8cm , then the length of the chord of the larger circle which touches the smaller circle is :
(A) 6cm (B) 12cm (C) 18cm (D) 9 cm
14.If A is an acute angle and tan A + cot A =2, then the value of $\sin^3 A + \cos^3 A$ is :
(A) 1 (B) 1/2 (C) $\sqrt{2}/2$ (D) $\sqrt{2}$
15.If the perimeter of a circle is equal to that of a square , then the ratio of their areas is :
(A) 22: 7 (B) 14:11 (C) 7:22 (D) 11:14
16.If median= 137 and mean = 137.05, then the value of mode is :
(A) 156.90 (B) 136.90 (C) 186.90 (D) 206.90
17) The probability of getting 53rd Monday in a leap year is :
A) 1/7 (B) 2/7 (C) 3/7 (D) 4/7
18. A fair die is thrown once. The probability of enen composite number is :
A) 0 (B) 1/3 (C) 3/4 (D) 1
19.Assertion(A) The equation $5x^2 - 2x + 3 = 0$ has not real roots.
Reason (R) The quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ has not real roots, if $b^2 - 4ac = 0$.
A) Both A and R are correct and R is correct explanation of A.
B) Both A and R are correct and R is not correct explanation of A.
C) A is correct but R is incorrect .
D) A is incorrect but R is correct.
20. Assertion (A) In an AP, $S_n = n^2+n$, then $a_{20} = 40$.
Reason (R) In an AP, $a_n - a_{n-1} = d$
A) Both A and R are correct and R is correct explanation of A.
B) Both A and R are correct and R is not correct explanation of A.
C) A is correct but R is incorrect.
D) A is incorrect but R is correct.

SECTION B(5Questions, 2marks each)

21. the zeroes of the polynomial $(k^2+4)x^2 + 13x + 4k$ are *reciprocal of each other* , then find the value of k .
OR
If the discriminant of the equation $6x^2 - bx + 2 = 0$ is 1, then find the value of b.

22. In an equilateral ΔABC , AD is perpendicular on BC, then $AD^2 =$ ___ (in terms of AB^2)

23. If 2p+1, 13 and 5p-3 are in Arithmetic Progression, then find the value of p .
OR
Solve the following pair of linear equation by elimination method.
3x-5y-4 =0 and 9x= 2y+7.
24.If LCM of (x , 18) =36 and HCF of (x , 18) =2 , then find x.
25. If the distance between the points (4 , p) and (1,0) is 5 , then find the value of p.

SECTION C (6 Questions , 3 marks each)

26. Prove that $\sqrt{3}$ is irrational. 0R Prove that $3- 2\sqrt{5}$ is irrational.

27. If the eighth term of an A.P is 31 and the fifteenth term is 16 more than the eleventh term. Find the A.P.

.

OR

. Find the value of $\sqrt{6+\sqrt{6+\sqrt{6+\sqrt{6}\ldots\ldots\ldots}}}$

28. Prove that the parallelogram circumscribing a circle is a rhombus.

29. The diagonals of a quadrilateral ABCD intersect each other at the point O such that $\frac{AO}{BO}=\frac{CO}{DO}$. Show that ABCD is a trapezium.

30. If $a\cos\theta + b\sin\theta = m$ and $a\sin\theta - b\cos\theta = n$, prove that $m^2 + n^2 = a^2 + b^2$.

31. Two dice are thrown simultaneously at random. Find the probability of getting (i) product 6 (ii) sum at least 10 (iii) sum less than or equal to 12.

SECTION D (4 Questions,5 marks each)

32. State and Prove Basic proportionality theorem.

Using the above theorem prove that a line through the point of intersection of the diagonals and parallel to the base of the trapezium divides the non parallel sides in the same ratio.

33. According to pollution control norms the minimum height of smoke emitting chimney should be 100m. This norm is to reduce air pollution and to maintain the air quality so that we can inhale fresh oxygen with any pollutant everyone should follow this norm. Angle of elevation of the top of a chimney from the top of a tower is 60^0 and the angle of depression of the foot of the chimney from the top of the tower is 30^0. If height of the tower is 40m, find the height of the chimney. State if the above mentioned chimney meets the pollution norms.

34.The mean of the following frequency distribution is 57.6 and the sum of the observations is 50. Find the missing frequencies F_1 and F_2..

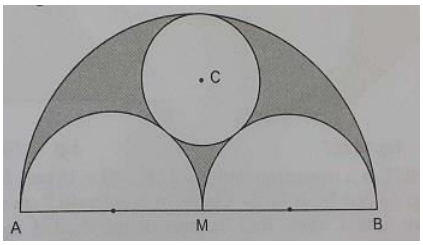
Class	0-20	20-40	40-60	60-80	80-100	100-120	Total
Frequency	7	F_1	12	F_2	8	5	50

OR

If the median of the following data is 32.5 . Find the values of x and y.

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Total
Frequency	X	5	9	12	Y	3	2	40

35. In the given fig. AB= 36cm and M is the mid point of AB. Semicircles are drawn on AB, AM and MB as diameters. A circle with centre C touches all three semicircles. Find area of shaded region



OR

A toy is in the form of a cone of radius 3.5cm mounted on a hemisphere of same radius .The total height of the toy is 15.5cm. Find the total surface area and volume of the toy.

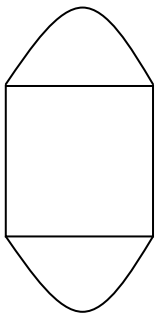
SECTION E (3Questions Case study based , 4 marks each)

36.Mathematics teacher of a school took her 10th standard students to show Gol Gumbaz. It was a part of their Educational trip. The teacher had interest in history as well. She narrated the facts of Gul Gumbaz to students. Gol Gumbaz is the tomb of king Muhammad Adil Shah, Adil Shah Dynasty. Construction of the tomb, located in Vijayapura Karnataka, India, was started in 1626 and completed in 1656. Then the teacher said in this monument one can find combination of solid figures. She pointed that there are cubical bases and hemisherical dome is at the top.

(i) What is the diagonal of the cubic portion of the Gol Gumbaz, if one side of cubical portion is 23m?

(ii) A solid piece of iron taken out from the back of Gol Gumbaz in the form of a cuboid of dimensions 49 cm × 33 cm × 24 cm, is moulded to form a solid sphere. The radius of the sphere is :

(iii) A block of Gol Gumbaz is in the shape of a cylinder of diameter 0.5 cm with two hemispheres stuck to each of its ends. The length of shape is 2 cm. The volume of the block is : (Use n = 3.14)



or

If two solid hemispheres of same base radii r; are joined together along their bases, then curved surface area of this new solid is :

37. Aditya is celebrating his birthday. He invited his friends. He bought a packet of toffees/candies which contains 120 candies. He arranges the candies such that in the first row there are 3 candies, in second there are 5 candies, in third there are 7 candies and so on.

(i) Find the total number of rows of candies.

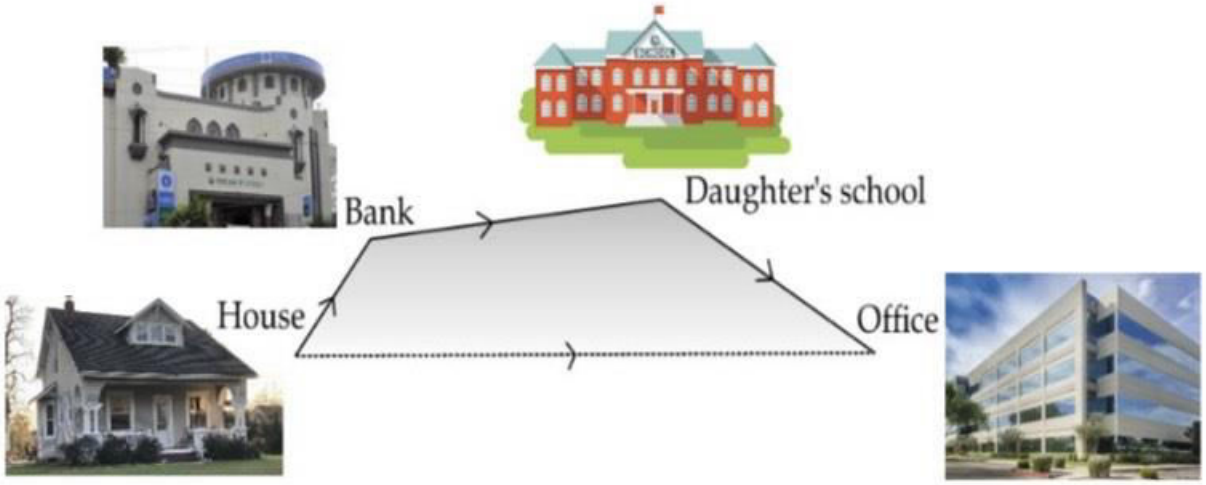
(ii) Find the number of candies in 15th row

(iii) How many candies are placed in last row?

OR

Find the difference in number of candies placed in 7th and 3rd row.

38. Aditya Starts walking from his house to office. Instead of going to the office directly, he goes to a bank first, from there to his daughter's school and then reaches the office.
(Assume that all distances covered are in straight lines). If the house is situated at (2, 4), bank at (5, 8), school at (13, 14) and office at (13, 26) and coordinates are in km.



(i) What is the distance between house and bank?

(ii) What is the distance between Daughter's School and bank?

(iii) What is the distance between house and office?

OR

What is the total distance travelled by Aditya to reach the office?

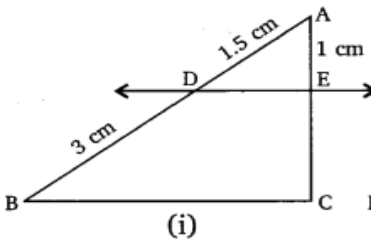
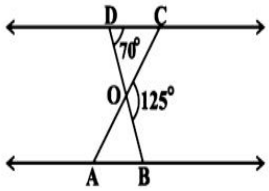
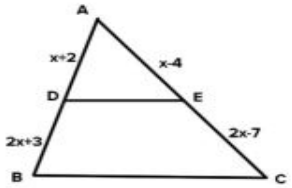
KENDRIYA VIDYALAYA SANGATHAN, JAMMU REGION
SAMPLE PAPER SET- 14

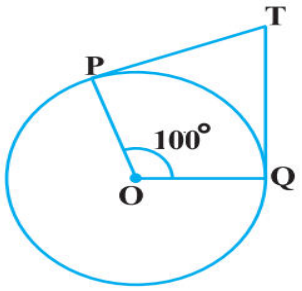
CLASS – X **SUBJECT- MATHS (STD)**
TIME – 3 HOURS **M.M- 80 MARKS**

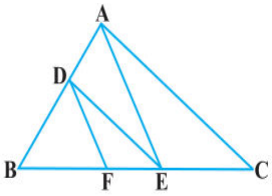
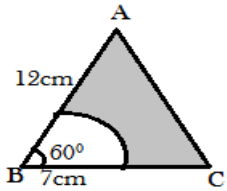
General Instructions:

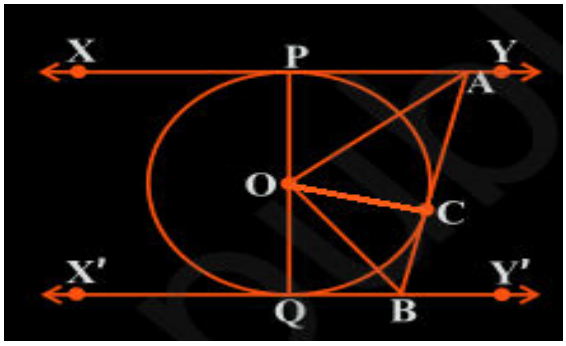
1. This Question Paper has 5 SectionsA-E.
2. Section **A** has 20 MCQs carrying 1 markeach
3. Section **B** has 5 questions carrying 02 markseach.
4. Section **C** has 6 questions carrying 03 markseach.
5. Section **D** has 4 questions carrying 05 markseach.
6. Section **E** has 3 case based integrated units of assessment (04 marks each) with sub- parts of the values of 1, 1 and 2 marks eachrespectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of SectionE
8. Draw neat figures wherever required. Take π =22/7 wherever required if notstated.

	SECTION A	
	Section A consists of 20 questions of 1 mark each.	
S.NO.		**MARKS**
1	If HCF (a, b) = 12 and a × b = 1800 then LCM (a, b) is (a) 3600 (b) 900 (c) 150 (d) 90	**1**
2	**The roots of $100x^2 - 20x + 1 = 0$ is:** (a) 1/20 and 1/20 (b) 1/10 and 1/20 (c) 1/10 and 1/10 (d) None of the above	**1**
3	**Zeroes of $p(x) = x^2-27$ are:** (a) $\pm 9\sqrt{3}$ (b) $\pm 3\sqrt{3}$ (c) $\pm 7\sqrt{3}$ (d) None of the above	**1**
4	The value of k, for which the system of equations x + (k + l)y = 5 and (k + l)x + 9y = 8k – 1 has infinitely many solutions is (a) 2 (b) 3 (c) 4 (d) 5	**1**
5	**The distance between the points (0, 5) and (–5, 0) is**	**1**

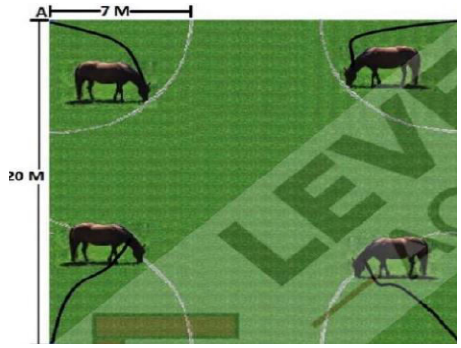
	(a) 5 units (b) 5√2 units (c) 2√5 units (d) 10 units	
6	 (i) **The value of EC is:** (a) 2.1 cm (b) 3 cm (c) 2 cm (d) 2.5 cm	**1**
7	Given that $\sin\theta = \frac{a}{b}$, then $\cos\theta$ is equal to a) $\frac{b}{\sqrt{b^2-a^2}}$ b) $\frac{b}{a}$ c) $\frac{\sqrt{b^2-a^2}}{b}$ d) $\frac{a}{\sqrt{b^2-a^2}}$	**1**
8	If Cos (A-B) = $\frac{\sqrt{3}}{2}$ and Sin (A+B) =1, then the value of A and B, respectively are **(a)** 45^0 and 15^0 (b) 30^0 and 15^0 (c) 60^0 and 30^0 (d) None of these	**1**
9	1. In the Fig., ΔODC ~ ΔOBA, ∠BOC = 125° and ∠CDO = 70°. Find ∠OAB.  (a) 55^o (b) 70^o (c) 125^o (d) 110^o	**1**
10	1. Find the value of x for which DE ∥ BC in the adjoining figure  a) x= 2 b) x=3 c) x = 1 d) x= 4	**1**
11	If TP and TQ are tangents to the circle with centre O and $\angle POQ = 100^0$,	**1**

	then what will be the value of $\angle PTQ$.  (a) 60^0 (b) 70^0 (c) 80^0 (d) 90^0	
12	If the area of a sector of a circle is $\frac{5}{18}$th of the area of that circle , then the central angle of the sector is: (a) 100^o (b) 70^o (c) 125^o (d) 110^o	**1**
13	Three cubes each of sides 5 cm are joined end to end , then the surface area of the resulting solid is (a) 350 cm^2(b) 300cm^2 (c) 250cm^2(d) 325cm^2	**1**
14	1. Find mode using empirical formula when mean and median are 10.5 and 9.6 resp. (a) 6.2 b) 7.2 c) 7.8 d) 6.8	**1**
15	The area of the circle that can be inscribed in a square of side 6cm is: (a) 36πcm^2 (b) 18πcm^2 (c)12πcm^2 (d) 9πcm^2	**1**
16	The median class of the given data is CLASS: 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 FREQUENCY: 4 | 4 | 7 | 10 | 12 | 8 | 5 a) 20-30 b) 30-40 c) 40-50 d) 50-60	**1**
17	. Two dice are tossed, the probability of getting doublets of odd numbers on both dice is (a) 3/12 (b) 1/12 (c) 4/12 (d) 2/12	**1**
18	Given 15 Cot A = 8, then Sin A = (a) $\frac{3}{5}$ (b) $\frac{4}{3}$ (c) 1 (d) None of these	**1**
19	**DIRECTION: In the question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option** **Statement A (Assertion)**: The H.C.F. of two numbers is 16 and their product is 3072. Then their L.C.M. = 162. **Statement R(Reason) : :** If a and b are two positive integers, then H.C.F. × L.C.M. = a × b.	**1**

	(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason (R) is true.	
20	**Statement A (Assertion): :The distance point P(2,3) from the x-axis is 3.** **Statement R(Reason) : : The distance from x-axis is equal to its ordinary.** (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason (R) is true.	**1**
	SECTION B	
	Section B consists of 5 questions of 2 marks each.	
S.No.		**Marks**
21	If x = a, y = b is the solution of the pair of equation x – y = 2 and x + y = 4, then find the value of a and b.	**2**
22	**.In the figure, DE||AC and DF||AE. Prove that BF/FE = BE/EC**  	**2**
23	Prove that the tangent drawn at the mid-point of an arc of a circle is parallel to the chord joining the end points of the arc.	**2**
24	Find the area of the segment of a circle of radius 14cm if the length of the corresponding arc is 22cm. OR A horse is tethered to one corner of a field ,which is in the shape of an equilateral triangle of side 12m.If the length of the rope is 7m, find the area of the field the horse cannot graze.  	**2**
25	If x = p sec θ + q tan θ and y = p tan θ + q sec θ, then prove that $x^2 - y^2 = p^2 - q^2$. OR If 5 sin θ = 4, prove that $\frac{1}{cos\theta} + \frac{1}{cot\theta} = 3$	**2**
	SECTION C	

	Section C consists of 6 questions of 3 marks each.	
S. No		**Marks**
26	Given that √2 is irrational, prove that 5 + 2√2 is irrational.	**3**
27	Q2 If the sum of the zeros of the quadratic polynomial ky^2 + 2y – 3k is equal to twice their product ,find k.	**3**
28	Students are made to stand in rows. If one student is extra in a row there would be 2 rows less. If one student is less in a row there would*be 3 rows more. Find the number of students in the class. OR The owner of a taxi company decides to run all the taxis on CNG fuel instead of petrol/diesel. The taxi charges in city comprises of fixed charges together with the charge for the distance covered. For a journey of 12 km, the charge paid is 789 and for journey of 20 km, the charge paid is ₹145. What will a person have to pay for travelling a distance of 30 km?	**3**
29	Prove that: $\frac{SinA-CosA}{SinA+CosA}+\frac{SinA+CosA}{SinA-CosA}=\frac{2}{2Sin^2A-1}$	**3**
30	InthefigureXYandX'Y'aretwoparalleltangentstoacirclewithcentre Oandanother tangent AB with point of contact C interesting XY at A and X'Y' at B, what is the measure of∠AOB.  OR	**3**
31	4. A bag contains 12 marbles out of which y are white. i) If one marble is drawn at random from the box, what is the probability that it will be white marble? ii) If 6 more white marbles are put in the bag, the probability of drawing a white marble will double as in (i), so, find y	**3**
	SECTION D	
	Section D consists of 4 questions of 5 marks each.	
S. No		**Marks**
32	A train, travelling at a uniform speed for 360 km, would have taken 48 minutes less to travel the same distance if its speed were 5 km/h more. Find the original speed of the train. **OR** A cyclist ,after riding a certain distance ,stopped for half an hour to repair	**5**

<table>
<tr><td></td><td>his bicycle, after which he completes the hole journey of 30 km at half speed in 5 hours , If If the breakdown have occurred 10 km farther off , he would have done the whole journey in 4 hours . Find where the breakdown occurred and the original speed</td><td></td></tr>
<tr><td>33</td><td>Prove that if a line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points, then the other two sides are divided in the same ratio.
By using the above theorem if in a triangle PQ is parallel to MN . If KP/PM= 4/13 , KN = 20.4 CM ,then find KQ</td><td>5</td></tr>
<tr><td>34</td><td>A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 4 cm and diameter of the base is 8 cm . Determine the volume of the toy. If a cube circumscribes the toy, then find the difference of the volume of cube and the toy. Also find the total surface area of the toy.
OR
A farmer runs a pipe of internal diameter 20 cm from a canal into a cylindrical tank in his field which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3 Km/h, in how much time tank be filled?</td><td>5</td></tr>
<tr><td>35</td><td>1. Find the values of x and y if the median of the following data is 31and sum of the frequencies is 40.
<table><tr><td>Classes Interval</td><td>Frequency</td></tr><tr><td>0-10</td><td>5</td></tr><tr><td>10-20</td><td>X</td></tr><tr><td>20-30</td><td>6</td></tr><tr><td>30-40</td><td>Y</td></tr><tr><td>40-50</td><td>6</td></tr><tr><td>50-60</td><td>5</td></tr><tr><td>TOTAL</td><td>40</td></tr></table>SECTION E</td><td>5</td></tr>
<tr><td></td><td>Case study based questions are compulsory.</td><td></td></tr>
<tr><td>S. No</td><td></td><td>Marks</td></tr>
<tr><td>36</td><td>. A stable owner has four horses. He usually tie these horses with 7m long rope to pegs at each corner of a square shaped gross field of 20m length, to graze in his farm. But tying with rope sometimes results in injuries to his horses, so he decided to built fence around each horse and let them freely move and graze separately in their own area.</td><td>1+2+1</td></tr>
</table>

	 Based on the above , find the following : (i). The total area of the field in which these horses can graze . (π=22/7) ii. How much the length of the rope of each horse be increased so that they can graze in maximum area without encroaching in each other's area. **OR** What is the area of the field that is un-grazed after increasing the length of the rope ? (iii). If the length of the rope is increased as per part (ii) above , find the cost of fencing	
37	A group of students of class X visited India Gate on an education trip. The  teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumentalsandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919.The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height. (i) What is the angle of elevation if they are standing at a distance of 42m awayfrom the monument? (ii) If the altitude of the Sun is at 60°, then the height of the vertical tower that willcast a shadow of length 20 m is OR The ratio of the length of a rod and its shadow is 1:1 . The angle of elevationof the Sun is	**1+2+1**

	(iii) The angle formed by the line of sight with the horizontal when the object viewdis below the horizontal level is	
38	India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year. **Based on the above information, answer the following questions:**i (i) Find the production during 8th year. (ii) Find the production during first 3 years. OR In which year, the production is Rs 29,200. (iii) . Find the difference of the production during 7th year and 4th year.	**1+2+1**

KENDRIYA VIDYALAYA SANGATHAN, JAMMU REGION

SAMPLE PAPER SET- 15

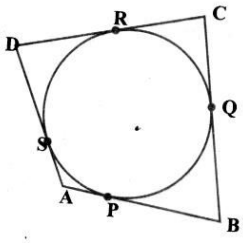
CLASS – X **SUBJECT- MATHS (STD)**

TIME – 3 HOURS **M.M- 80 MARKS**

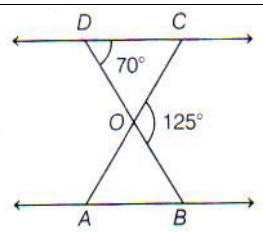
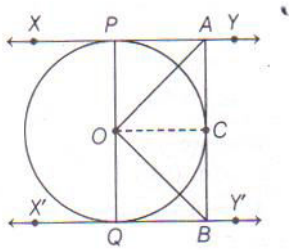
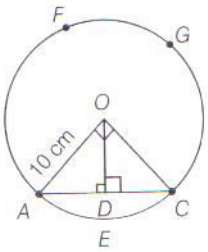
General Instructions:

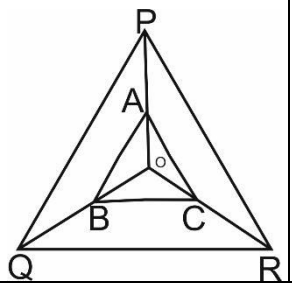
(i) This question paper has 5 section A-E.
(ii) Section A has 20 MCQs carrying 1 mark each
(iii) Section B has 5 questions carrying 02 marks each
(iv) Section C has 6 questions carrying 03 marks each
(v) Section D has 4 questions carrying 05 marks each.
(vi) Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
(vii) All questions are compulsory. However, an internal choice in 2Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E.
(viii) Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

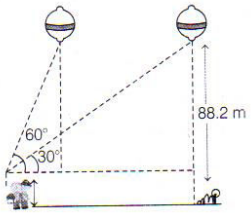
	Section A	
Q1	If the HCF of 35 and 45 is 5, LCM of 35 and 45 is 63 x a.The value of a is a) 5 b) 10 c) 15 d) 0	
Q2	If the discriminant of the equation $6x^2$-bx+2=0 is 1, then value of b is a) + 7 b) -7 c) both of them d) none	
Q3	Ifα, β are the zeros of a polynomial f(x) = px^2-2x+3p and $\alpha+ \beta = \alpha\beta$. The p is a) $\frac{-2}{3}$ b) $\frac{2}{3}$ c) $\frac{1}{3}$ d) $\frac{-1}{3}$	
Q4	The value of k, for which the pair of linear equations x + y – 4 = 0 and 2x + ky-3=0 is inconsistent. a) 0 b) 2 c) 6 d) 8	
Q5	The distance of point p (2, 3) from x-axis is a) 2 b) 3 c) 1 d) 5	
Q6	Two polygons of the same number of sides are similar, if their corresponding sides are a) equal b) proportional c) Both a & b d) None of these	
Q7	If sinθ-Cos θ= 0. Then value of θ is	

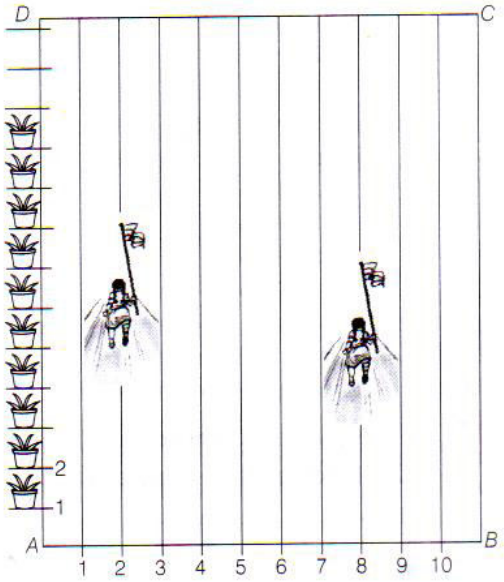
	a) 30^O b) O^O c) 45^O d) 60^O	
Q8	If $x = 2\sin^2\theta$ and $y = 2\text{Cos}^2\theta + 1$. Then value of x + y is a) 2 b) 3 c) 4 d) 5	
Q9	For which natural number n, 6^n ends with digit zero? a) 6 b) 5 c) 0 d) none of these	
Q10	Is any sequence defined by $a_n=2n^2+1$ forms an AP? a) Yes b) No c) Cannot be determined d) None of these	
Q11	The point which divides the line segment joining the points (7, -6) and (3, 4) in the ratio 1:2 internally lies in the a) 1^{st} Quadrant b) 2^{nd} Quadrant c) 3^{rd} Quadrant d) 4^{th} Quadrant	
Q12	In ΔABC and ΔDEF, $\angle B = \angle E$, $\angle F = \angle C$ and AB = 3DE. Then the two triangles are a) Congruent but not similar b) Similar but not congruent c) Neither congruent not similar d) Congruent as well as similar	
Q13	In a given figure a circle touches all the four sides of a quadrilateral ABCD with AB = 6cm, BC = 7cm, CD = 4cm then length of AD is  a) 3cm b) 4cm d) 5cm d) 6cm	
Q14	If the perimeter of a circle is equal to that of a square, then the ratio of their areas is a) 22:7 b) 14:11 c) 7: 22 d) 11:14	
Q15	An arc of a circle is of length 5πcm and the sector it bounds has an area of $20\pi\text{cm}^2$ then radius of the circle is a) 4cm b) 8cm c) 12 cm d) 16cm	
Q16	A Surahi is the combination of a) a sphere and a cyclinder b) a hemisphere and a cone c) two hemisphere	

	d) a cylinder and a cone	
Q17	Assertion (A) : If P (E) = 0.35, then probability of not E is 0.65 Reasoning (R) : For any event E, $0 \leq P(E) \leq 1$ a) Both A and R are true and R is correct explanation for A b) Both A and R are true and R is not correct explanation for A c) (A) is false But (R) is true d) (A) is true But R is false	
Q18	If the difference of mode and median of a data is 24, then the difference of median and mean is a) 12 b) 24 c) 8 d) 36	
Q19	The cumulative frequency table is useful in determining a) Mean b) median c) mode d) All of these	
Q20	Assertion (A) :$\sqrt{5}$is an irrational number (R) : Square root of a prime number is rational. a) Both A and R are true and R is correct explanation for A. b) Both A and R are true and R is not correct explanation for A c) (A) is false But (R) is true d) (A) is true But R is false	
	Section B (2 Marks each)	
Q21	Solve the following pair of linear equations 41x+53y=135 53x+41y=147 Or Find the value of k for which the following system of equations has infinitely many solutions x + (k + 1) y = 5 (k + 1) x + 9y = 8k-1	
Q22	In the given figure, $\Delta ODC \sim \Delta OBA$, $\angle BOC = 125^O$ and $\angle CDO = 70^O$, Find$\angle DOC$, $\angle DCO$ and $\angle OAB$.	

		
Q23	In the given figure, XY and X'Y' are two parallel tangents to a circle with Centre O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B. Prove that∠AOB=90^{O}. 	
Q24	If Cotθ=3x - $\frac{1}{12x}$, show that Cot θ+ Cosec θ= 6x or -$\frac{1}{6x}$ Or If Sin θ+2 Cos θ=1, prove that 2 Sin θ-Cos θ=2.	
Q25	A chord of a circle of radius 10cm subtends a right angle at the centre. Find the area of the corresponding (i) Minor segment **(ii)** Major segment. (Take π=31.4) 	
	Section C (3 Marks each)	
Q26	Prove that 6-2$\sqrt{3}$is irrational or Prove that $\sqrt{5}$is irrational	
Q27	Find the zeroes of a quadratic polynomial x^2-5x+6 and verify the relationship between the zeroes and the coefficient	
Q28	Solve the following quadratic equation $\frac{x-1}{x-2}+\frac{x-3}{x-4}=3\frac{1}{3}$	

Q29	Prove the identity $(\text{Sin A} + \text{CosecA})^2 + (\text{Cos A}+\text{SecA})^2$ $= 7 + \tan^2\text{A} + \text{Cot}^2\text{A}$ Or $(\text{Cosec}\ \theta - \text{Cot}\theta)^2 = \frac{1-Cos\theta}{1+Cos\theta}$	
Q30	In ΔPQR, right angled at Q, PR+QR=25 cm and PQ=5cm. Determine the values of Sin P, Cos P and tan P.	
Q31	Two customers, Shyam and Ekta are visiting a particular shop in the same week (Tuesday to Saturday). Each is equally likely to visit the shop on any day as on another day What is the probability that both will visit the shop on (i) The same day? (ii) Consecutive days? (iii) Different days	
	Section D (5 marks each)	
Q32	Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each incorrect answer, then Yash would have scored 50 marks. How many questions were there in the test? Or Places A and B are 100km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5h. If they travel towards each other, they meet in 1h. What are the speeds of the two cars?	
Q33	a) State and Prove Thale'stheorm b) In Fig. A, B and C are points on OP, OQ and OR respectively such that AB ‖PQ and AC ‖PR. Show that BC ‖QR. 	

Q34	From the top of a 7m high building, the angle of elevation of the top of a cable tower is 60^O and the angle of depression of its foot is 45^O. Determinne the height of the tower. Or A 1.2m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60^O. After sometime, the angle of elevation reduces to 30^O (see the figure). Find the distance travelled by the balloon during the interval.  	
Q35	Water in a canal, 6m wide and 1.5m deep is flowing with a speed of 10km/h. How much area will it irrigate in 30min, if 8 cm of standing water is needed?	
	Section E (4 marks each)	
Q36	India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6^{th} year and 22600 in 9^{th} year.  Based on the above information, answer the following questions (i) Find the production during first year. (ii) Find the production during 8^{th} year. (iii) Find the production during first 3 years **or** (iv) In which year, the production is Rs. 29200.	

Q37	To conduct sports day activities in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1 m each, 100 flower pots have been placed at a distance of 1m from each other along AD, as shown in figure.  Seeta runs $\frac{1}{4}$th the distance AD onthe 2nd line and posts a green flag. Geeta runs $\frac{1}{5}$th the distance AD on the 8th line and posts a red flag. Answer the following questions which are based on above figure. (i) Write the coordinates of green flag. (ii) Write the coordinates of red flag (iii) Find the distance between both the flags. **or** (iv)If Rashmi has to post a blue flag exactly half way between the line segment joining the flags, then find the coordinates of that point	
Q38	A Tesla car manufacturing industry wants to declare the mileage of their electric cars. For this, they recorded the mileage (km/charge) of 100 cars of the same model. Details of which are given in the following table **Mileage (km/charge) / Number of Cars** 100-120 : 14 120-140 : 24 140-160 : 36 160-180 : 26  Based on the above information, anwer the following questions. (i) Find the average mileage of above data (ii) The modal value of the given data is (iii) The median value of the given data is	