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Pre Board - 1 (2024-25) SET 1

CLASS-X

SUBJECT-MATHEMATICS STANDARD (CODE-041)

Time allowed: 3 hours Maximum Marks: 80

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General Instructions :

1. This Question paper contains five sections A , B , C , D , E

2.Section A has 18 MCQs and 02 Assertion – Reason based questions of 1 mark each.

3. Section B has 5 Very Short Answer (VSA) type questions of 2 marks each.

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

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

6. Section E has 3 Case study type questions of 4 marks each with sub parts.

7. All questions are compulsory. However, an internal choice in 2 questions of 5 marks. 2 Qs os 3 marks and 2 Qs of 2 marks has been provided. An internal choice has been provide in the 2 marks Qs of Section E.

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## SECTION A

( This section comprises of MULTIPLE CHOICE QUESTIONs type questions (MCQ) of 1 marks each )

1. If HCF OF 144 AND 180 IS EXPRESSED IN THE FORM 13m-3,then m is
   a) 1 b) 2 c) 3 d) 4

2. If $\alpha$ and $\beta$ are the roots of $x^2-1$, then value of $(\alpha + \beta)$ is ,
   b) a ) -2 b) 0 c) 1 d) -1

3 . If a pair of linear equation is consistent, then the the lines will be :
   a )parallel b) always coincident c) intersecting or coincident d)always intersecting

4. The graph of a polynomial P (x) cuts the X axis at 4 points and touches it at 2 other points. The number of zeroes of P (x) is :
   a ) 4 b) 2 c) 0 d) 3

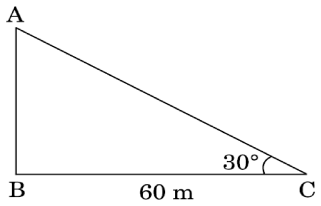
5 . If 5 is a zero of the quadratic polynomial , $x^2 – kx -15$ , then the value of k is

a ) 2 b) 0 c) 1 d) -1

6. Which term of the A.P: 27,24,21 , 18 ……is zero

a ) 5th term b) 7th term c) 10th term d) 9th term

7 The angle of elevation of the top of the tower AB from a point C on the ground, which is 60 m away from the foot of the tower, is $30^O$, as shown in Figure. Find the height of the tower.




a ) $10\sqrt{3}$m b) $30\sqrt{3}$m c) 10m d) 60m

8. The centre of a circle whose end points of a diameter are (– 6, 3) and (6, 4) is

(a) (8, – 1) (b) (4, 7) (c) (0, 7/2) (d) (4, 7/2)

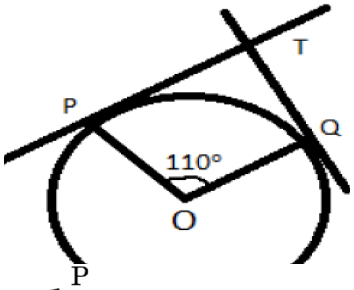
9) The co-ordinates of the point which is reflection of point (–3, 5) in x-axis are

(a) (3, 5) (b) (3, –5) (c) (–3, –5) (d) (–3, 5)

10. In the given figure, if TP and TQ are tangents To a circle with centre O, so that ∠POQ = 110°, then ∠PTQ is

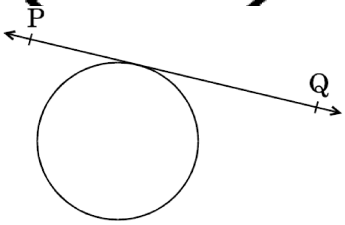
(a) 110° (b) 90°

(c) 80° (d) 70°




11) In the given circle in Figure, number of tangents parallel to tangent PQ is

(a ) 0 (b) 1 (c) infinite (d) none of these




12. In a ΔABC, D and E are points on the sides AB and AC respectively such that I DB= 3cm and AE=1cm, find AC.

(a) 5cm (b) 4cm (c)1.5cm (d) 3cm

13. The two side AB and AC of right triangle ABC are in the ratio 1 : 2 . What will be the value of angle C ?

(a)$90^0$ (b) $60^0$ (c)$45^0$ (d)$30^0$

14. If a cone is cut parallel to the base of it by a plane in two parts, then the shape of the top of the cone will be

a) Sphere b) Cube c) Cone d) Cylinder

15. Two right circular cones have their heights in the ratio 1 : 3 and radii in the ratio 3 : 1 . What is the ratio of their volumes ?

a ) 9 : 1 b) 1:3 c) 2 ; 3 d) 3 : 1

16 . For a frequency distribution, mean, median and mode are connected by the relation

(a) Mode = 3 Mean – 2 median (b) Mode = 2 median - 3 Mean

(c) Mode = 3median -2 Mean (d) Mode = 3 median + 2 Mean

17. If the mean of the following distribution is 2.6, then the value of y is…

| Variable(x) | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Frequency (y) | 4 | 5 | Y | 1 | 2 |

(a) 3 (b) 8 (c) 13 (d) 24

18. Two dice are thrown simultaneously. What is the probability of getting doublet?
(a) 1/36 (b) 1/6 (c) 5/6 (d) 11/36

Instructions for answering assertion and reason based questions. You have to choose option
19Assertion (A): In a circle of radius 6 cm , the angle of sector is 60o then the area of sector is 7 132 cm2)
Reason (R): Area of a sector of a circle with radius r is 2 360 πr θ
(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

20. Assertion (A): The probability of getting exactly one head in tossing a pair of coins is 1/4.
Reason (R): The sample space of two coin tossed is = {HH, TT, HT, TH} = 4
(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

## Section B

( This section comprises of very short answer type questions (VSA) of 2 marks each )

21. Check whether $6^n$ can end with the digit 0 for any natural number.

Or

Explain why ( 7 x 11 x 13 ) + 13 and ( 7 x 6 x 5 x 4 x3 x2 x 1) + 5 are composite numbers.

22. In what ratio does the point ( $\frac{24}{11}$ , y ) divide the line segment joining the point P ( 2, -2 ) and Q ( 3, 7) ? Also find the value of y.

23. Cards numbered 1 to 30 are put in a bag. A card is drawn at random from this bag. Find the probability that the number on the drawn card is (i) not divisible by 3 (ii) a prime number greater than 7.

24. A triangular plot of land has vertices at A(2,3), B(5,7) and C(9,3). Find the length of each side of the triangle and classify the triangle by its sides.

25. . Evaluate: $3 \cos^2 60° \sec^2 30° – 2 \sin^2 30° \tan^2 60°$.

## Section C

( This section comprises of very short answer type questions (SA) of 3 marks each )

26. Prove that $\sqrt{5}$ is an irrational number.

27. A two-digit number is such that product of its digits is 18. When 63 is subtracted from the number, the digits interchange their places. Find the number.

OR

A passenger train takes 2 hours less for a journey of 300 km if its speed is increased by 5 km/hour from its usual speed. Find the usual speed of the train

28. State and prove Basic Proportional theorem

29. Show that: $\theta + \theta = \theta - \theta$

OR

Prove that $\frac{sin - cos + 1}{sin + cos - 1} = \frac{1}{sec - tan}$ (using the identity $sec^2 \theta = 1 + tan^2 \theta$)

30. A chord of circle of radius 14cm makes a right angle at the centre. Find the areas of minor and major segments of the circle

31. . For the given pair of linear equations 2x + y = 6, 2x = y + 2. Draw the graph of the two equations on the same graph paper and find the solution of X and Y.

Section D

( This section comprises of long answer type questions (LA) of 5 marks each )

32. Sum of the areas of two squares is 544 $m^2$. If the difference of their perimeters is 32 m, find the sides of the two squares.

OR

The area of a rectangle gets reduced by 9 square units, if its length is reduced by 5 units and breadth is increased by 3 units. If we increase the length by 3 units and the breadth by 2 units, the area increases by 67 square units. Find the dimensions of the rectangle.

33. Sides AB and AC and median AD of a triangle ABC are respectively proportional to sides PQ and PR and median PM of another triangle PQR. Show that $\Delta ABC \sim \Delta PQR$.

34. The angles of depression of the top and the bottom of an 8 m tall building from the top of a multi-storeyed building are 30°and 45°, respectively. Find the height of the multistory building and the distance between the two buildings.

OR

From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Determine the height of the tower.

35. The median of the following data is 525. Find the values of *x* and *y*, if the total frequency is 100.

| Class Interval | Frequency |
|---|---|
| 0 - 100 | 2 |
| 100 - 200 | 5 |

| | |
|---|---|
| 200 - 300 | X |
| 300 - 400 | 12 |
| 400 - 500 | 17 |
| 500 - 600 | 20 |
| 600 - 700 | y |
| 700 - 800 | 9 |
| 800 - 900 | 7 |
| 900 - 1000 | 4 |

SECTION E

( This section comprises of 3 case – study / passage based questions of 4 marks each with two sub sections. First two case study questions have three sub questions of marks 1 , 1 , 2 respectively. The third case study question has two sub questions of 2 marks each. )

36. Read the following text and answer the following questions on the basis of the same

Manpreet Kaur is the national record holder for women in the shot-put discipline. Her throw of 18.86m at the Asian Grand Prix in 2017 is the maximum distance for an Indian female athlete. Keeping her as a role model, Sanjitha is determined to earn gold in Olympics one day.

Initially her throw reached 7.56m only. Being an athlete in school, she regularly practiced both in the mornings and in the evenings and was able to improve the distance by 9cm every week. During the special camp for 15 days, she started with 40 throws and every day kept increasing the number of throws by 12 to achieve this remarkable progress.

(i) How many throws Sanjitha practiced on 11th day of the camp ? ( 1 mark)

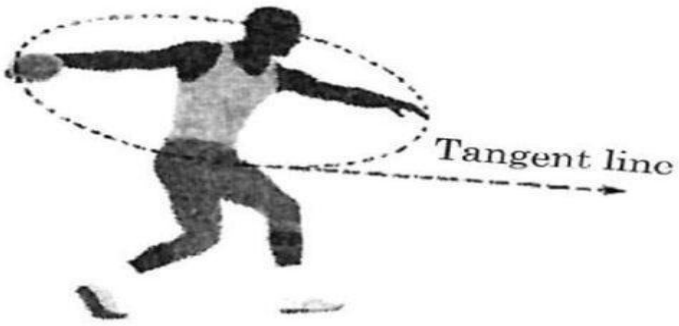
(ii) What would be Sanjitha's throw distance at the end of 6 weeks? (1 mark)

(or)

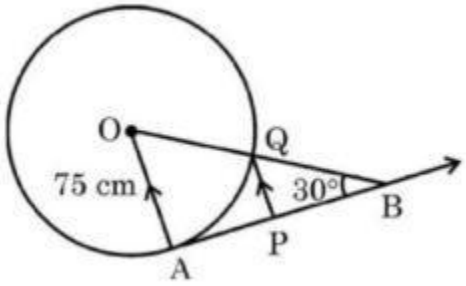
When will she able to achieve a throw of 11.16 m? ( 1 mark)

(iii) How many throws did she do during the entire camp of 15 days? ( 2 mark)

37. The discus throw is an event in which an athlete attempts to throw a discus. The athlete spins anti-clockwise around one and a half times through a circle, then releases the throw. When released, the discus travels along tangent to the circular spin orbit.




In the given figure, AB is one such tangent to a circle of radius 75 cm. Point O is centre of the circle and angleABO $=30^0$. PQ is parallel to OA.:




Based on above information:

(a) find the length of AB. (1 marks)

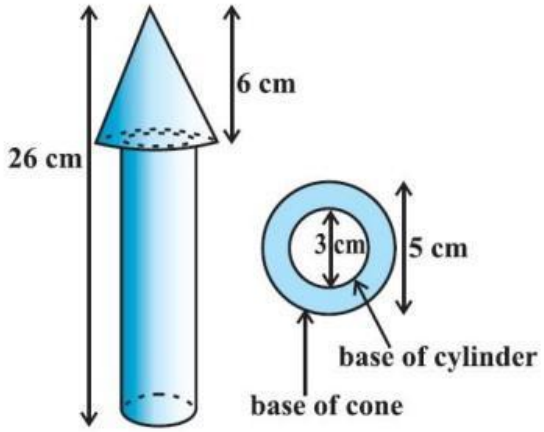
(b) find the length of OB. (1 marks)

(c) find the length of AP. (2marks)

OR

Find the length of PQ

38.
In a toys manufacturing company, wooden parts are assembled and painted to prepare a toy. One specific toy is in the shape of a cone mounted on a cylinder. For the wood processing activity center, the wood is taken out of storage to be sawed, after which it undergoes rough polishing, then is cut, drilled and has holes punched in it. It is then fine polished using sandpaper. For the retail packaging and delivery activity center, the polished wood sub-parts are assembled together, then decorated using paint. The total height of the toy is 26 cm and the height of its conical part is 6 cm. The diameters of the base of the conical part is 5 cm and that of the cylindrical part is 3 cm. On the basis of the above information, answer the following questions:




(a) If its cylindrical part is to be painted yellow, find the surface area need to be painted. [1]
(b) If its conical part is to be painted green, find the surface area need to be painted. [1]
(c) Find the volume of the wood used in making this toy. [2]
OR

(c) If the cost of painting the toy is 30 paise per sq cm, then find the cost of painting the toy. (Use $\pi = 3.14$) [2]