Sample Paper 17

Class - 10th Exam - 2026 - 27

Mathematics - Basic

Time : 3 Hours **Max. Marks : 80**

General Instructions :

1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion - Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 36-38 are case study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 2 Question of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = \frac{22}{7}$ wherever required if not stated.
11. Use of calculators is not allowed.

SECTION - A

Section A consists of 20 questions of 1 mark each.

1. A sector is cut from a circular sheet of radius 100 cm, the angle of the sector being 240°. If another circle of the area same as the sector is formed, then radius of the new circle is

(a) 79.5 cm (b) 81.5 cm

(c) 83.4 cm (d) 88.5 cm

2. If a card is selected from a deck of 52 cards, then the probability of its being a red face card is

(a) $\frac{3}{26}$ (b) $\frac{3}{13}$

(c) $\frac{2}{13}$ (d) $\frac{1}{2}$

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

(a) $\cos\beta$ (b) $\cos 2\beta$

(c) $\sin\alpha$ (d) $\sin 2\alpha$

4. The point P on x-axis equidistant from the points $A(-1, 0)$ and $B(5, 0)$ is

(a) (2, 0) (b) (0, 2)

(c) (3, 0) (d) $(-3, 5)$

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5. The base radii of a cone and a cylinder are equal. If their curved surface areas are also equal, then the ratio of the slant height of the cone to the height of the cylinder is

(a) 2 : 1 (b) 1 : 2

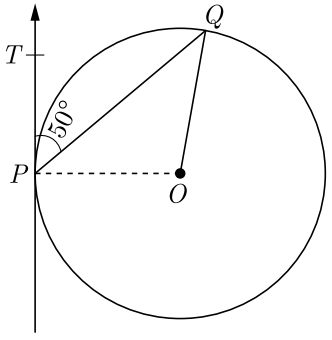
(c) 1 : 3 (d) 3 : 1

6. ΔABC is an equilateral triangle with each side of length $2p$. If $AD \perp BC$ then the value of AD is

(a) $\sqrt{3}$ (b) $\sqrt{3}\,p$

(c) $2p$ (d) $4p$

7. In figure, O is the centre of circle. PQ is a chord and PT is tangent at P which makes an angle of 50° with $PQ\angle POQ$ is



(a) 130° (b) 90°

(c) 100° (d) 75°

8. The roots of the quadratic equation $x^2 - 0.04 = 0$ are

(a) ± 0.2 (b) ± 0.02

(c) 0.4 (d) 2

9. In a frequency distribution, the mid value of a class is 10 and the width of the class is 6. The lower limit of the class is

(a) 6 (b) 7

(c) 8 (d) 12

10. The value of k for which the system of linear equations $x + 2y = 3$, $5x + ky + 7 = 0$ is inconsistent is

(a) $-\frac{14}{3}$ (b) $\frac{2}{5}$

(c) 5 (d) 10

11. If α and β are the zeroes of the polynomial $2x^2 - 13x + 6$, then $\alpha + \beta$ is equal to

(a) -3 (b) 3

(c) $\frac{13}{2}$ (d) $-\frac{13}{2}$

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12. If the common difference of an AP is 5, then what is $a_{18} - a_{13}$?

(a) 5 (b) 20

(c) 25 (d) 30

13. The distance between the points $(a\cos\theta + b\sin\theta,\ \ 0)$, and $(0,\ \ a\sin\theta - b\cos\theta)$ is

(a) $a^2 + b^2$ (b) $a^2 - b^2$

(c) $\sqrt{a^2 + b^2}$ (d) $\sqrt{a^2 - b^2}$

14. If one zero of the polynomial $(3x^2 + 8x + k)$ is the reciprocal of the other, then value of k is

(a) 3 (b) -3

(c) $\frac{1}{3}$ (d) $-\frac{1}{3}$

15. The point on the x-axis which is equidistant from the points $A(-2, 3)$ and $B(5, 4)$ is

(a) (0, 2) (b) (2, 0)

(c) (3, 0) (d) $(-2, 0)$

16. If $3x + 4y : x + 2y = 9 : 4$, then $3x + 5y : 3x - y$ is equal to

(a) 4 : 1 (b) 1 : 4

(c) 7 : 1 (d) 1 : 7

17. A tree casts a shadow 15 m long on the level of ground, when the angle of elevation of the sun is 45°. The height of a tree is

(a) 10 m (b) 14 m

(c) 8 m (d) 15 m

18. The quadratic equation $2x^2 - \sqrt{5}\,x + 1 = 0$ has

(a) Two distinct real roots (b) Two equal real roots

(c) No real roots (d) More than 2 real roots

19. **Assertion :** Sum of first 10 terms of the arithmetic progression $-0.5,\ -1.0,\ -1.5,$ ..... is 31.
Reason : Sum of n terms of an AP is given as $S_n = \frac{n}{2}[2a + (n-1)\,d]$ where a is first term and d common difference.

(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 :** When a positive integer a is divided by 3, the values of remainder can be 0, 1 or 2.
Reason : According to Euclid's Division Lemma $a = bq + r$, where $0 \le r < b$ and r is an integer.

(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).

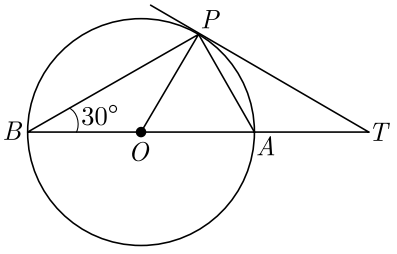
(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

SECTION - B

Section B consists of 5 questions of 2 marks each.

21. In the given figure, BOA is a diameter of a circle and the tangent at a point P meets BA when produced at T. If $\angle PBO = 30^{0}$, what is the measure of $\angle PTA$?



22. A bag contains 5 red, 8 green and 7 white balls. One ball is drawn at random from the bag, find the probability of getting :

(i) not a white ball,

(ii) neither a green nor a red ball.

OR

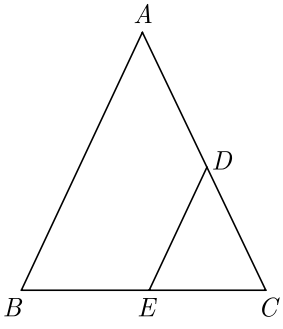
Two coins are tossed together. Find the probability of getting both heads or both tails.

23. If $\tan 2A = \cot(A - 18^{\circ})$, where $2A$ is an acute angle, find the value of A.

24. In $\Delta ABC, AD \perp BC$, such that $AD^2 = BD \times CD$. Prove that ΔABC is right angled at A.

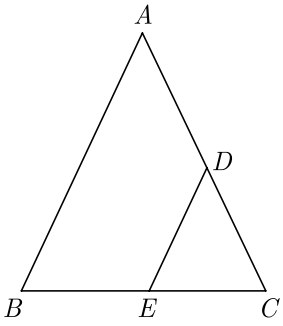
OR

In the figure of ΔABC, the points D and E are on the sides CA, CB respectively such that $DE \,||\, AB$, $AD = 2x, DC = x + 3, BE = 2x - 1$ and $CE = x$. Then, find x.

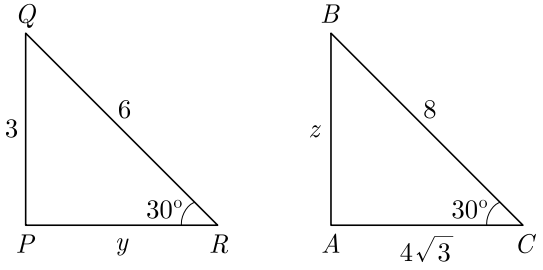


OR

In the figure of ΔABC, $DE || AB$. If $AD = 2x$, $DC = x + 3$, $BE = 2x - 1$ and $CE = x$, then find the value of x.



25. In the given figure, $\Delta ABC \sim \Delta PQR$. Find the value of $y + z$.



SECTION - C

Section C consists of 6 questions of 3 marks each.

26. The $\frac{3}{4}$th part of a conical vessel of internal radius 5 cm and height 24 cm is full of water. The water emptied into a cylindrical vessel with internal radius 10 cm. Find the height of water in cylindrical vessel.

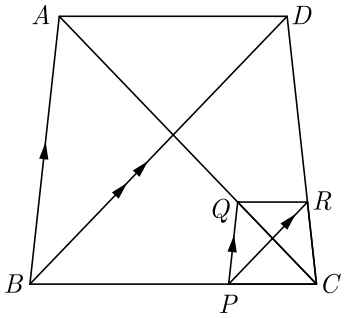
27. Find a quadratic polynomial whose zeroes are reciprocals of the zeroes of the polynomial $f(x) = ax^2 + bx + c$, $a \neq 0$, $c \neq 0$.

28. Two right triangles ABC and DBC are drawn on the same hypotenuse BC and on the same side of BC . If AC and BD intersect at P, prove that $AP \times PC = BP \times DP$.

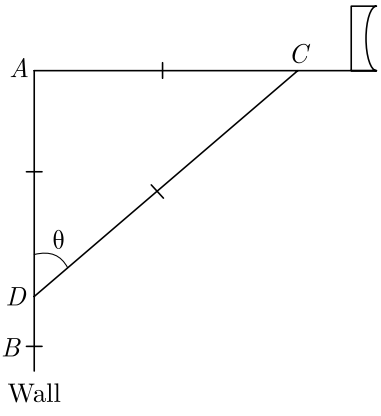
OR

In the given figure, two triangles ABC and DBC lie on the same side of BC such that $PQ || BA$ and $PR || BD$. Prove that $QR || AD$.

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29. The rod of TV disc antenna is fixed at right angles to wall AB and a rod CD is supporting the disc as shown in Figure. If $AC = 1.5$ m long and $CD = 3$ m, find (i) $\tan\theta$ (ii) $\sec\theta + \operatorname{cosec}\theta$.



30. A vessel is in the form of a hemispherical bowl surmounted by a hollow cylinder of same diameter. The diameter of the hemispherical bowl is 14 cm and the total height of the vessel is 13 cm. Find the total surface area of the vessel. Use $\pi = \frac{22}{7}$

OR

A sphere of diameter 12 cm, is dropped in a right circular cylindrical vessel, partly filled with water. If the sphere is completely submerged in water, the water level into the cylindrical vessel rises by $3\frac{5}{9}$ cm. Find the diameter of the cylindrical vessel.

31. Solve the following pair of linear equations :

$$8x + 5y = 9$$
$$3x + 2y = 4$$

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SECTION - D

Section D consists of 4 questions of 5 marks each.

32. Solve for x : $\left(\frac{2x}{x-5}\right)^2+\left(\frac{2x}{x-5}\right)-24=0, x\neq 5$

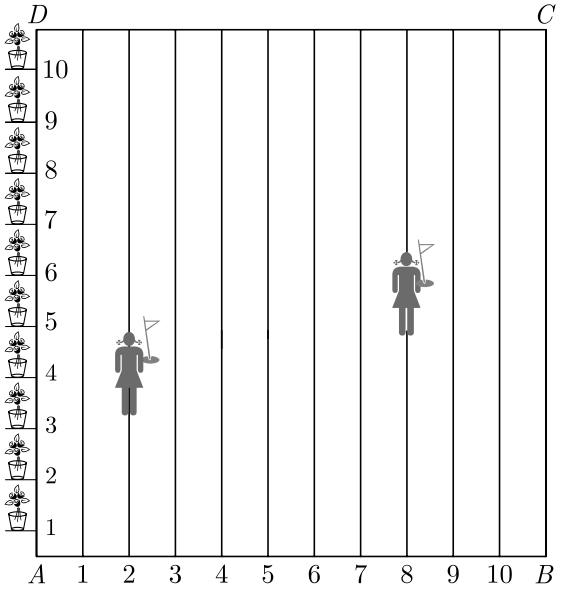
OR

Solve for x : $\frac{x+3}{x-2}-\frac{1-x}{x}=\frac{17}{4};\ \ x\neq 0,\ 2$

33. To conduct Sports Day activities, in your rectangular 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 1 m from each other along AD, as shown in Figure. Niharika runs ¼th the distance AD on the 2nd line and posts a green flag. Preet runs $\frac{1}{5}$th distance AD on the eighth line and posts a red flag.

(i) What is the distance between the two flags?

(ii) If Rashmi has to post a blue flag exactly half way between the line segment joining the two flags, where should she post the blue flag?



34. If the angle between two tangents drawn from an external point P to a circle of radius a and centre O, is 60°, then find the length of OP.

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

Class	Frequency
0-100	2
100-200	5
200-300	x
300-400	12

Class	Frequency
400-500	17
500-600	20
600-700	y
700-800	9
800-900	7
900-1000	4

OR

On annual day of a school, 400 students participated in the function. Frequency distribution showing their ages is as shown in the following table :

Ages (in years)	05-07	07-09	09-11	11-13	13-15	15-17	17-19
Number of students	70	120	32	100	45	28	5

Find mean and median of the above data.

SECTION - E

Section E consists of 3 case study based questions of 4 marks each.

36. MASK : Masks are an additional step to help prevent people from getting and spreading COVID-19. They provide a barrier that keeps respiratory droplets from spreading. Wear a mask and take every day preventive actions in public settings.



Due to ongoing Corona virus outbreak, Wellness Medical store has started selling masks of decent quality. The store is selling two types of masks currently type A and type B.

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The cost of type A mask is Rs. 15 and of type B mask is Rs. 20. In the month of April, 2020, the store sold 100 masks for total sales of Rs. 1650.

(i) How many masks of each type were sold in the month of April? If the store had sold 50 masks of each type, what would be its sales in the month of April?

(ii) Due to great demand and short supply, the store has increased the price of each type by Rs. 5 from May 1, 2020. In the month of May, 2020, the store sold 310 masks for total sales of Rs. 6875. How many masks of each type were sold in the month of May?

(iii) What percent of masks of each type sale was increased in the month of May, compared with the sale of month April?

OR

(iv) What extra profit did store earn by increasing price in May month.

37. Box : For the box to satisfy certain requirements, its length must be three unit greater than the width, and its height must be two unit less than the width.



(i) If width is taken as x, find the polynomial that represent volume of box.

(ii) Find the polynomial that represent the area of paper sheet used to make box.

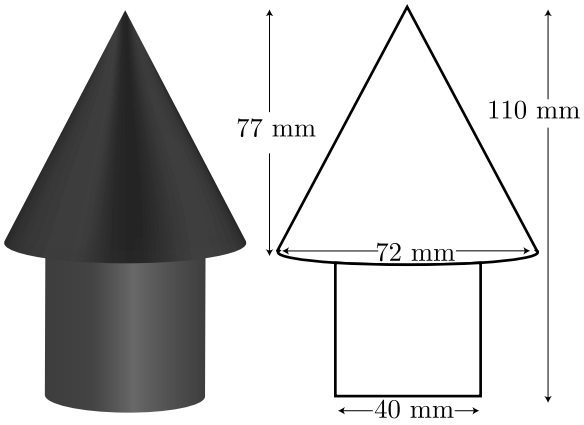
(iii) If it must have a volume of 18 unit, what must be its length and height ?

OR

(iv) If box is made of a paper sheet which cost is Rs 100 per square unit, what is the cost of paper?

38. In a toys manufacturing company, wooden parts are assembled and painted to prepare a toy. 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.

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One specific toy is in the shape of a cone mounted on a cylinder. The total height of the toy is 110 mm and the height of its conical part is 77 mm. The diameters of the base of the conical part is 72 mm and that of the cylindrical part is 40 mm.

(i) If its cylindrical part is to be painted red, what is the surface area need to be painted ?

(ii) If its conical part is to be painted blue, what is the surface area need to be painted ?

(iii) How much of the wood have been used in making the toy ?

OR

(iv) If the cost of painting the toy is 2 paise for 8π mm^2, then what is the cost of painting of a box of 100 toys?

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