Sample Paper 12

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. Someone is asked to take a number from 1 to 100. The probability that it is a prime, is

(a) $\frac{8}{25}$ (b) $\frac{1}{4}$

(c) $\frac{3}{4}$ (d) $\frac{13}{50}$

2. For which value(s) of p, will the lines represented by the following pair of linear equations be parallel

$3x - y - 5 = 0$ $6x - 2y - p = 0$

(a) all real values except 10 (b) 10

(c) 5/2 (d) 1/2

3. If a regular hexagon is inscribed in a circle of radius r, then its perimeter is

(a) $3r$ (b) $6r$

(c) $9r$ (d) $12r$

4. The value of the expression $\text{cosec}(75^\circ + \theta) - \sec(15^\circ - \theta) - \tan(55^\circ + \theta) + \cot(35^\circ - \theta)$ is

(a) -1 (b) 0

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

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5. Two APs have the same common difference. The first term of one of these is -1 and that of the other is -8. Then the difference between their 4th terms is

(a) -1 (b) -8

(c) 7 (d) -9

6. For the following distribution:

Marks	Number of students
Below 10	3
Below 20	12
Below 30	27
Below 40	57
Below 50	75
Below 60	80

The modal class is

(a) 10-20 (b) 20-30

(c) 30-40 (d) 50-60

7. 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) $-\frac{1}{3}$

8. 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

9. The coordinates of a point A on y-axis, at a distance of 4 units from x-axis and below it are

(a) (4, 0) (b) (0, 4)

(c) $(-4, 0)$ (d) $(0, -4)$

10. $(x^2+1)^2 - x^2 = 0$ has

(a) Four real roots (b) Two real roots

(c) No real roots (d) One real root

11. The LCM of smallest two digit composite number and smallest composite number is

(a) 12 (b) 4

(c) 20 (d) 44

12. The top of two poles of height 20 m and 14 m are connected by a wire. If the wire makes an angle of 30° with the horizontal, then the length of the wire is

(a) 12 m (b) 10 m

(c) 8 m (d) 6 m

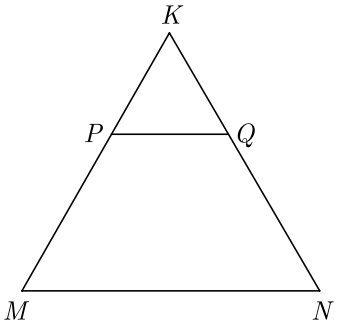
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13. A ladder, leaning against a wall, makes an angle of 60° with the horizontal. If the foot of the ladder is 2.5 m away from the wall, find the length of the ladder.

(a) 5 m (b) 5.5 m

(c) 2.5 m (d) 4.5 m

14. In the figure, PQ is parallel to MN. If $\frac{KP}{PM} = \frac{4}{13}$ and $KN = 20.4$ cm then find KQ.



(a) 4.8 cm (b) 4.6 cm

(c) 4.4 cm (d) 4.2 cm

15. Ratio of lateral surface areas of two cylinders with equal height is

(a) 1 : 2 (b) $H : h$

(c) $R : r$ (d) None of these

16. In the formula $\overline{x} = a + \frac{\sum f_i d_i}{\sum f_i}$, for finding the mean of grouped data d_i's are deviation from a of

(a) Lower limits of the classes (b) Upper limits of the classes

(c) Mid-points of the classes (d) Frequencies of the class marks

17. If the zeroes of the quadratic polynomial $ax^2 + bx + c$, where $c \neq 0$, are equal, then

(a) c and a have opposite signs (b) c and b have opposite signs

(c) c and a have same sign (d) c and b have the same sign

18. Two coins are tossed simultaneously. The probability of getting at most one head is

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

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

19. **Assertion :** If a wire of length 22 cm is bent in the shape of a circle, then area of the circle so formed is $40\,\text{cm}^2$.

Reason : Circumference of the circle = length of the wire.

(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 :** The slant height of the frustum of a cone is 5 cm and the difference between the radii of its two circular ends is 4 cm. Then the height of the frustum is 3 cm.
Reason : Slant height of the frustum of the cone is given by $l = \sqrt{(R-r)^2 + h^2}$.

(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.

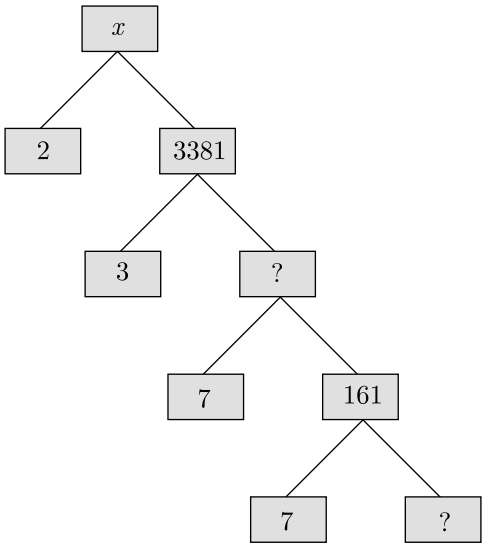
SECTION - B

Section B consists of 5 questions of 2 marks each.

21. The x-coordinate of a point P is twice its y-coordinate. If P is equidistant from $Q(2, -5)$ and $R(-3, 6)$, find the co-ordinates of P.

22. Prove that in two concentric circles, the chord of the larger circle, which touches the smaller circle is bisected at the point of contact.

23. Complete the following factor tree and find the composite number x.



OR

Show that 571 is a prime number.

24. How many terms of AP 3, 5, 7, 9, ... must be taken to get the sum 120?

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25. Find, 100 is a term of the AP $25, 28, 31, ...$ or not.

OR

The seventeenth term of an AP exceeds its 10^{th} term by 7. Find the common difference.

SECTION - C

Section C consists of 6 questions of 3 marks each.

26. An isosceles triangle ABC, with $AB = AC$, circumscribes a circle, touching BC at P, AC at Q and AB at R. Prove that the contact point P bisects BC.

OR

From a point P, which is at a distant of 13 cm from the centre O of a circle of radius 5 cm, the pair of tangents PQ and PR are drawn to the circle, then the area of the quadrilateral $PQOR$ (in cm^2).

27. The top of two poles of height 16 m and 10 m are connected by a length l meter. If wire makes an angle of 30° with the horizontal, then find l.

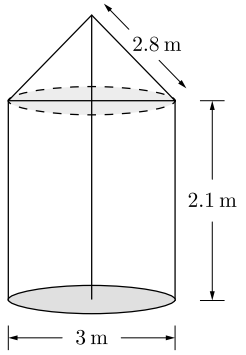
28. Find the probability that 5 Sundays occur in the month of November of a randomly selected year.

29. Solve graphically : $2x + 3y = 2,\ x - 2y = 8$

30. A solid is in the shape of a cone mounted on a hemisphere of same base radius. If the curved surface areas of the hemispherical part and the conical part are equal, then find the ratio of the radius and the height of the conical part.

OR

A tent is in the shape of cylinder surmounted by a conical top of same diameter. If the height and diameter of cylindrical part are 2.1 m and 3 m respectively and the slant height of conical part is 2.8 m, find the cost of canvas needed to make the tent if the canvas is available at the rate of Rs.500 per square meter. Use $\pi = \frac{22}{7}$.



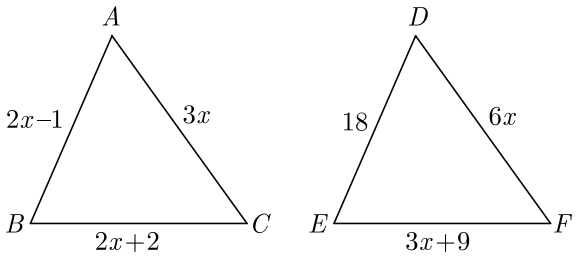
31. Solve for x : $\frac{1}{x} + \frac{2}{2x-3} = \frac{1}{x-2}, x \neq 0,\ \frac{2}{3},\ 2.$

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SECTION - D

Section D consists of 4 questions of 5 marks each.

32. In Figure, if $\Delta ABC \sim \Delta DEF$ and their sides of lengths (in cm) are marked along them, then find the lengths of sides of each triangle.

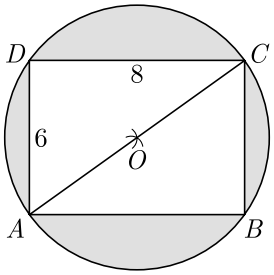


33. If α and β are the zeroes of the polynomial $p(x) = 2x^2 + 5x + k$ satisfying the relation, $\alpha^2 + \beta^2 + \alpha\beta = \frac{21}{4}$, then find the value of k.

OR

If β and $\frac{1}{\beta}$ are zeroes of the polynomial $(a^2 + a)x^2 + 61x + 6a$. Find the value of β and α.

34. Find the area of the shaded region in Figure, if $ABCD$ is a rectangle with sides 8 cm and 6 cm and O is the centre of circle. (Take $\pi = 3.14$)



35. If $\sec\theta = x + \frac{1}{4x}, x \neq 0$ find $(\sec\theta + \tan\theta)$.

OR

Evaluate : $\sin^2 30^\circ \cos^2 45^\circ + 4\tan^2 30^\circ + \frac{1}{2}\sin 90^\circ - 2\cos^2 90^\circ + \frac{1}{24}$

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SECTION - E

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

36. Satellite Images : Satellite images are images of Earth collected by imaging satellites operated by governments and businesses around the world. Satellite imaging companies sell images by licensing them to governments and businesses such as Apple Maps and Google Maps. It should not be confused for astronomy images collected by space telescope.



Barun lives in Jaipur in Vaishali. 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- axes. If he goes 2 cm east and 3 cm north from the house, then he reaches to a grocery store, If he goes 4 cm west and 6 cm south from the house, then he reaches to his office. If he goes 6 cm east and 8 cm south from the house, then he reaches to a food court. If he goes 6 cm west and 8 cm north from the house, he reaches to a his kid's school.

Based on the above information, answer the following questions.

(i) Find the distance between grocery store and food court.

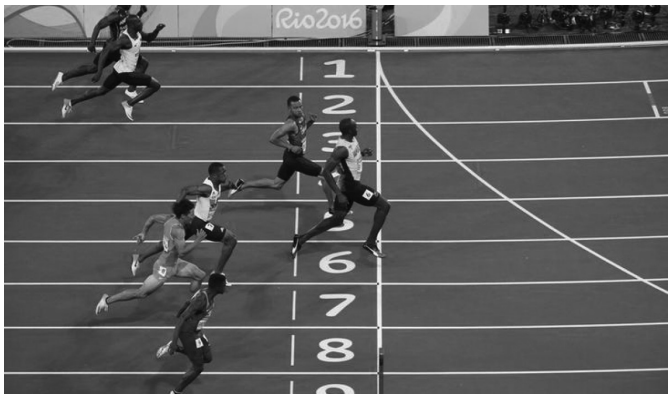
(ii) Find the distance of the school from the house.

(iii) 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

Find the ratio of distances of house from school to food court.

37. 100 Metres Race : The 100 metres is a sprint race in track and field competitions. The shortest common outdoor running distance, it is one of the most popular and prestigious events in the sport of athletics. It has been contested at the summer Olympics since 1896 for men and since 1928 for women. The World Championships 100 metres has been contested since 1983. The reigning 100 m Olympic or world champion is often named "the fastest man or woman in the world".



A stopwatch was used to find the time that it took a group of students to run 100 m.

Time (in sec)	0-20	20-40	40-60	60-80	80-100
No. of students	8	10	13	6	3

Based on the above information, answer the following questions.

(i) Estimate the mean time taken by a student to finish the race.

(ii) What will be the upper limit of the modal class?

(iii) What is the sum of lower limits of median class and modal class ?

OR

How many students finished the race within 1 minute?

38. Swimming Pool : The volume of water in a rectangular, in-ground, swimming pool is given by $V(x) = x^3 + 11x^2 + 24x$ where $V(x)$ is the volume in cubic feet when the water is x ft high.

(i) Find the dimension of base of pool.

(ii) Use the remainder theorem to find the volume when $x = 3$ ft.

(iii) If the volume is 100 ft^3 of water, what is the height x ?

OR

(iv) If the maximum capacity of the pool is 520 ft^3 what is the maximum depth?



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