Sample Paper 07

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. Select the least number that is divisible by all numbers between 1 and 10 (both inclusive).

(a) 2520 (b) 5040

(c) 1010 (d) 2020

2. If $x = 3\sin\theta + 4\cos\theta$ and $y = 3\cos\theta - 4\sin\theta$ then $x^2 + y^2$ is

(a) 25 (b) 45

(c) 7 (d) 49

3. ΔABC and ΔBDE are two equilateral triangle such that D is the mid-point of BC. Ratio of the areas of triangles ABC and BDE is ..... .

(a) 1 : 1 (b) 3 : 1

(c) 2 : 1 (d) 4 : 1

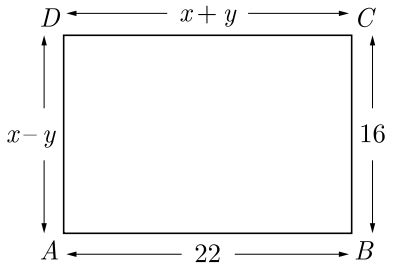
4. If the sum of the areas of two circles with radii R_1 and R_2 is equal to the area of a circle of radius R, then

(a) $R_1 + R_2 = R$ (b) $R_1^2 + R_2^2 = R^2$

(c) $R_1 + R_2 < R$ (d) $R_1^2 + R_2^2 < R^2$

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5. In the figure given below, $ABCD$ is a rectangle. The values of x and y will be



(a) 3 and 19 (b) 19 and 3

(c) 4 and 18 (d) 18 and 4

6. Two lines are given to be parallel. The equation of one of the lines is $4x+3y=14$, then the equation of the second line will be

(a) $12x+9x=42$ (b) $12x+9y=5$

(c) $12x+8y=15$ (d) $12x+8y=42$

7. If m and n are the zeroes of the polynomial $3x^2+11x-4$, then value of $\frac{m}{n}+\frac{n}{m}$ will be

(a) $\frac{12}{145}$ (b) $-\frac{12}{145}$

(c) $-\frac{145}{12}$ (d) $\frac{145}{12}$

8. The 4th term from the end of an AP $-11, -8, -5,$ ....., 49 is

(a) 37 (b) 40

(c) 43 (d) 58

9. The common difference of the AP $\frac{1}{p}, \frac{1-p}{p}, \frac{1-2p}{p}$, ... is

(a) 1 (b) $\frac{1}{p}$

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

10. If one root of the equation $(k-1)x^2-10x+3=0$ is the reciprocal of the other then the value of k is .....

(a) 2 (b) 3

(c) 4 (d) 5

11. If the point $C(k, 4)$ divides the line segment joining two points $A(2, 6)$ and $B(5,1)$ in ratio 2 : 3, the value of k is ..... .

(a) $\frac{5}{16}$ (b) $\frac{16}{5}$

(c) $\frac{9}{5}$ (d) $\frac{5}{9}$

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12. 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

13. While computing mean of grouped data, we assume that the frequencies are

(a) Evenly distributed over all the classes

(b) Centred at the class marks of the classes

(c) Centred at the upper limits of the classes

(d) Centred at the lower limits of the classes

14. If $k+1 = \sec^2\theta(1+\sin\theta)(1-\sin\theta)$, then the value of k. will be

(a) 0 (b) 1

(c) 2 (d) 15

15. 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

16. If the height and length of the shadow of a man are equal, then the angle of elevation of the sun is,

(a) 45° (b) 60°

(c) 90° (d) 120°

17. A die is thrown once. What is the probability of getting a prime number?

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

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

18. If p and q are the zeroes of polynomial $f(x) = 2x^2 - 7x + 3$, the value of $p^2 + q^2$ will be

(a) $\frac{39}{5}$ (b) $\frac{5}{39}$

(c) $\frac{37}{4}$ (d) $\frac{4}{37}$

19. **Assertion :** If in a circle, the radius of the circle is 3 cm and distance of a point from the centre of a circle is 5 cm, then length of the tangent will be 4 cm.
Reason : $(\text{hypotenuse})^2 = (\text{base})^2 + (\text{height})^2$

(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.

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20. **Assertion :** The equation $x^2+3x+1=(x-2)^2$ is a quadratic equation.
Reason : Any equation of the form $ax^2+bx+c=0$ where $a \neq 0$, is called a quadratic equation.
(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. A circle is inscribed in a ΔABC touching AB, BC and AC at P, Q and R respectively. If $AB=10$ cm $AR=7$ cm and $CR=5$ cm, then find the length of BC

22. Find a relation between x and y such that the point $P(x,y)$ is equidistant from the points $A(-5,3)$ and $B(7,2)$.

23. Explain whether $3\times12\times101+4$ is a prime number or a composite number.

OR

Show that $5\sqrt{6}$ is an irrational number.

24. Is 184 a term of the sequence $3,7,11,.....$?

OR

The ninth term of an AP is -32 and the sum of its eleventh and thirteenth term is -94. Find the common difference of the AP

25. If the sum of first m terms of an AP is the same as the sum of its first n terms, show that the sum of its first $(m+n)$ terms is zero.

SECTION - C

Section C consists of 6 questions of 3 marks each.

26. An integer is chosen between 70 and 100. Find the probability that it is
(i) a prime number
(ii) divisible by 7

27. The angle of elevation of the top of a building from the foot of a tower is 30° and the angle of elevation of the top of a tower from the foot of the building is 60°. If the tower is 50 m high, then find the height of the building.

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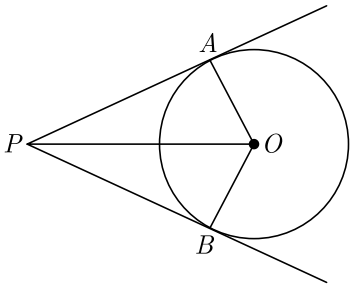
28. Solve graphically : $2x-3y+13=0;\ 3x-2y+12=0$

29. Solve the following equation: $\frac{1}{x}-\frac{1}{x-2}=3,\ x\neq 0,\ 2$

30. If tangents PA and PB drawn from an external point P to a circle with centre O are inclined to each other at an angle of 80°, then find $\angle POA$.

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.



31. From a solid cylinder whose height is 15 cm and the diameter is 16 cm, a conical cavity of the same height and same diameter is hollowed out, Find the total surface area of remaining solid. (Given your answer in terms of π).

OR

A solid right-circular cone of height 60 cm and radius 30 cm is dropped in a right-circular cylinder full of water of height 180 cm and radius 60 cm. Find the volume of water left in the cylinder in cubic metre. Use $\pi=\frac{22}{7}$.

SECTION - D

Section D consists of 4 questions of 5 marks each.

32. Four equal circles are described at the four corners of a square so that each touches two of the others. The shaded area enclosed between the circle is $\frac{24}{7}$ cm^2. Find the radius of each circle.

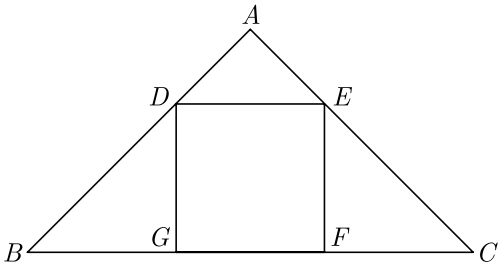
33. Polynomial $x^4+7x^3+7x^2+px+q$ is exactly divisible by $x^2+7x+12$, then find the value of p and q.

OR

If α and β are the zeroes of polynomial $p(x)=3x^2+2x+1$, find the polynomial whose zeroes are $\frac{1-\alpha}{1+\alpha}$ and $\frac{1-\beta}{1+\beta}$.

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34. In the given figure, $DEFG$ is a square and $\angle BAC = 90^\circ$. Show that $FG^2 = BG \times FC$.



35. If $\sin\theta + \cos\theta = \sqrt{3}$, then prove that $\tan\theta + \cot\theta = 1$.

OR

Evaluate : $\tan^2 30^\circ \sin 30^\circ + \cos 60^\circ \sin^2 90^\circ \tan^2 60^\circ - 2\tan 45^\circ \cos^2 0^\circ \sin 90^\circ$

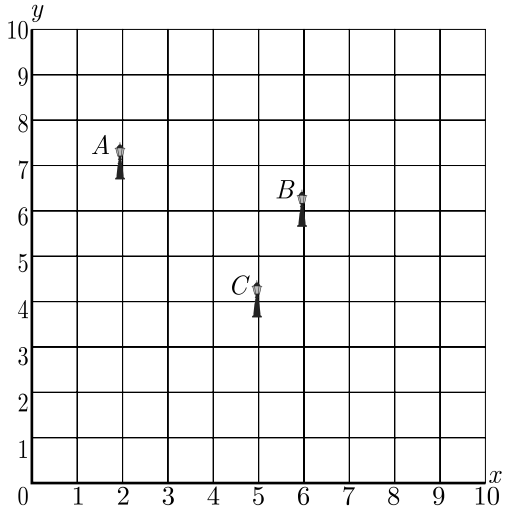
SECTION - E

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

36. Resident Welfare Association (RWA) of a Gulmohar Society in Delhi have installed three electric poles A, B and C in a society's common park. Despite these three poles, some parts of the park are still in dark. So, RWA decides to have one more electric pole D in the park.



The park can be modelled as a coordinate systems given below.



On the basis of the above information, answer any four of the following questions:

(i) What is the position of the pole C?

(ii) What is the distance of the pole B from the corner O of the park ?

(iii) Find the position of the fourth pole D so that four points A, B C and D form a parallelogram.

OR

What is the distance between poles A and C ?

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

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

38. Air Quality Index : AQI is an index for reporting air quality on a daily basis. The purpose of the AQI is to help people know how the local air quality impacts their health. The Environmental Protection Agency (EPA) calculates the AQI for five major air pollutants :

1. Ground-level ozone
2. Particle pollution/particulate matter (PM2.5/pm 10)
3. Carbon Monoxide
4. Sulfur dioxide
5. Nitrogen dioxide

The higher the AQI value, the greater the level of air pollution and the greater the health concerns.



Following frequency distribution shows the Air Quality Index of different localities of Delhi on 27th December 2020 reported by Times of India Newspaper on 28th December 2020.

AIQ	Number of weeks f
270-280	4
280-290	10
290-300	14
300-310	20
310-320	24
320-330	8
Total	80

Based on the above information, answer the following questions.

(i) Estimate the mean AQI.

(ii) In which class does the median of distribution lie ?

(iii) In which class does the mode of distribution lie?

OR

What is the median AQI?

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