Sample Paper 15

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. Two different dice are tossed together. What is the probability that the number on each die is even ?

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

(c) $\frac{3}{4}$ (d) $\frac{1}{6}$

2. A fraction becomes $\frac{1}{3}$ when 2 is subtracted from the numerator and it becomes $\frac{1}{2}$ when 1 is subtracted from the denominator. The fraction will be

(a) $\frac{7}{15}$ (b) $\frac{8}{15}$

(c) $\frac{6}{15}$ (d) $\frac{9}{15}$

3. If -1 is a zero of the polynomial $f(x) = x^2 - 7x - 8$, then other zero is

(a) 4 (b) 8

(c) 1 (d) –4

4. The quadratic equation $3x^2 + 4\sqrt{3}\,x + 4$ has

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

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

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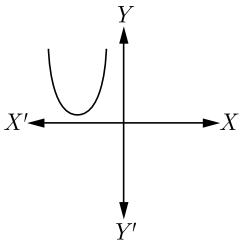
5. Given the linear equation $3x+4y=9$. Select another linear equation in these two variables such that the geometrical representation of the pair so formed is intersecting lines.

(a) $3x-5y=10$ (b) $6x+8y=18$

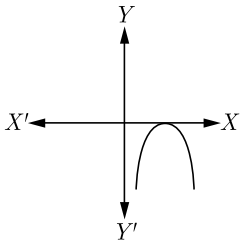
(c) $8x+12y=18$ (d) above all

6. Which of the following is not the graph of a quadratic polynomial?

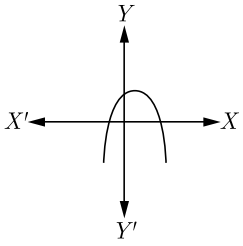
(a)



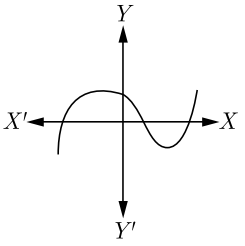
(b)



(c)



(d)



7. If the point $P(x,y)$ is equidistant from the points $Q(a+b,b-a)$ and $R(a-b,a+b)$ then,

(a) $2ay=xy$ (b) $bx=ay$

(c) $ab=xy$ (d) $by=ax$

8. The HCF and LCM of 378, 180 and 420 of will be

(a) 6 and 3980 (b) 12 and 3780

(c) 6 and 3780 (d) 12 and 3980

9. The quadratic equation $x^2-4x-3\sqrt{2}=0$ has

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

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

10. If $\tan 2A = \cot(A+60^\circ)$, where $2A$ is an acute angle, the value of A will be

(a) 20° (b) 30°

(c) 60° (d) 10°

11. What do you say about the solution of the pair of linear equations $y=0$ and $y=-5$?

(a) No solution (b) Unique solution

(c) Infinitely solution (d) Can't say anything

12. A circle artist is climbing a 20 m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground, then the height of pole, if the angle made by the rope with the ground level is 30°, is

(a) 5 m (b) 10 m

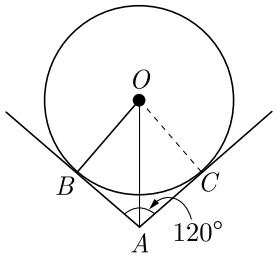
(c) 15 m (d) 20 m

13. The 11th term of an AP -5, $\frac{-5}{2}$, 0, $\frac{5}{2}$, ..., is

(a) -20 (b) 20

(c) -30 (d) 30

14. In the given figure, two tangents AB and AC are drawn to a circle with centre O such that $\angle BAC = 120^\circ$, then OA is equal to that



(a) $2AB$ (b) $3AB$

(c) $4AB$ (d) $5AB$

15. Ratio of volumes of two cones with same radii is

(a) $h_1 : h_2$ (b) $s_1 : s_2$

(c) $r_1 : r_2$ (d) None of these

16. For the following distribution:

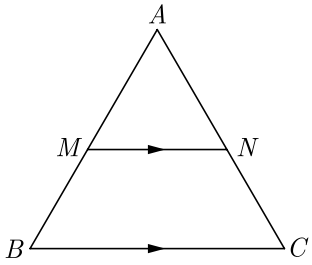
Marks	**Number of students**
Below 10	3
Below 20	12
Below 30	27
Below 40	57
Below 50	75
Below 60	80

The modal class is

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

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

17. In figure, $MN \parallel BC$ and $AM : MB = 1:2$, then $\frac{ar(\Delta AMN)}{ar(\Delta ABC)} =$ .....



(a) $\frac{1}{3}$ (b) $\frac{1}{9}$
(c) $\frac{8}{9}$ (d) $\frac{5}{9}$

18. $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = ?$

(a) $\sin\theta - \cos\theta$ (b) $\sec\theta - \tan\theta$
(c) $\sec\theta + \tan\theta$ (d) $\sin\theta + \cos\theta$

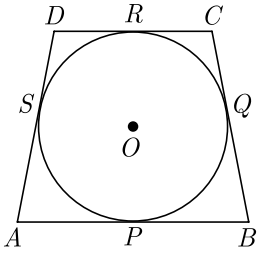
19. **Assertion :** If the outer and inner diameter of a circular path is 10 m and 6 m then area of the path is $16\pi\, m^2$.
Reason : If R and r be the radius of outer and inner circular path, then area of path is $\pi(R^2 - r^2)$.
(a) Both assertion (A) and reason (R) are true and reason (R) is the 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.

20. **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.

SECTION - B

Section B consists of 5 questions of 2 marks each.

21. In Figure a quadrilateral $ABCD$ is drawn to circumscribe a circle, with centre O, in such a way that the sides AB, BC, CD, and DA touch the circle at the points P, Q, R and S respectively. Prove that. $AB + CD = BC + DA$.



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22. Prove that the point $(3,0)$, $(6,4)$ and $(-1,3)$ are the vertices of a right angled isosceles triangle.

23. Check whether 4^n can end with the digit 0 for any natural number n.

OR

Show that 571 is a prime number.

24. The 8^{th} term of an AP is zero. Prove that its 38^{th} term is triple of its 18^{th} term.

OR

If the number $x+3, 2x+1$ and $x-7$ are in AP find the value of x.

25. If S_n the sum of first n terms of an AP is given by $S_n = 3n^2 - 4n$, find the n^{th} term.

SECTION - C

Section C consists of 6 questions of 3 marks each.

26. Solve for x : $\frac{2x}{x-3} + \frac{1}{2x+3} + \frac{3x+9}{(x-3)(2x+3)} = 0, x \neq 3, -\frac{3}{2}$

27. If a circle touches the side BC of a triangle ABC at P and extended sides AB and AC at Q and R, respectively, prove that $AQ = \frac{1}{2}(BC + CA + AB)$

OR

In $\Delta ABD, AB = AC$. If the interior circle of ΔABC touches the sides AB, BC and CA at D, E and F respectively. Prove that E bisects BC.

28. A child has a die whose six faces show the letters as shown below:

A	A	B	C	C	C

The die is thrown once. What is the probability of getting (i) A, (ii) C ?

29. An aeroplane, when flying at a height of 4000 m from the ground passes vertically above another aeroplane at an instant when the angles of elevation of the two planes from the same point on the ground are 60^o and 45^o respectively. Find the vertical distance between the aeroplanes at that instant. (Use $\sqrt{3} = 1.73$)

30. Determine the values of m and n so that the following system of linear equation have infinite number of solutions :

$$(2m-1)x + 3y - 5 = 0$$
$$3x + (n-1)y - 2 = 0$$

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31. A hemispherical bowl of internal diameter 36 cm contains liquid is filled into 72 cylindrical bottles of diameter 6 cm. Find the height of the each bottle, if 10% liquid is wasted in this transfer.

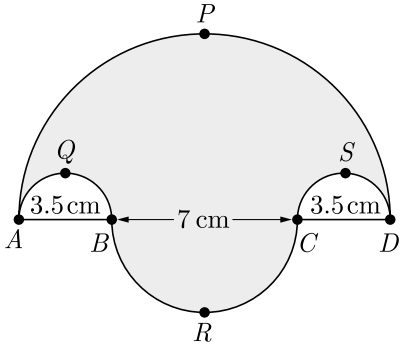
OR

A hollow cylindrical pipe is made up of copper. It is 21 dm long. The outer and inner diameters of the pipe are 10 cm and 6 cm respectively. Find the volume of copper used in making the pipe.

SECTION - D

Section D consists of 4 questions of 5 marks each.

32. Find the area of the shaded region in Figure, $\widehat{APD}, \widehat{AQB}, \widehat{BRC}$ and $\widehat{CSD}$, are semi-circles of diameter 14 cm, 3.5 cm, 7 cm and 3.5 cm respectively. Use $\pi = \frac{22}{7}$.



33. 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.

OR

Find the zeroes of the quadratic polynomial $7y^2-\frac{11}{3}y-\frac{2}{3}$ and verify the relationship between the zeroes and the coefficients.

34. In $\Delta ABC, AD$ is the median to BC and in $\Delta PQR, PM$ is the median to QR. If $\frac{AB}{PQ}=\frac{BC}{QR}=\frac{AD}{PM}$. Prove that $\Delta ABC \sim \Delta PQR$.

35. Prove that: $\frac{\sin\theta}{\cot\theta+\operatorname{cosec}\theta}=2+\frac{\sin\theta}{\cot\theta-\operatorname{cosec}\theta}$

OR

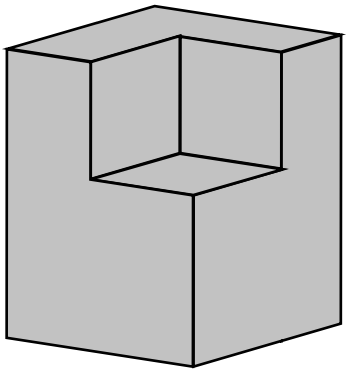
If $\sqrt{3}\cot^2\theta-4\cot\theta+\sqrt{3}=0$, then find the value of $\cot^2\theta+\tan^2\theta$.

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SECTION - E

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

36. Volume of Solid : A cuboidal solid of base x by $x+1$ is shown in figure. Height of original solid is $x+2$. A small cuboidal solid of base $x-2$ by $x-2$ and height 2 is cut from this solid as shown in figure.



(i) Find the polynomial for the volume of remaining solid.

(ii) Use the remainder theorem to determine the volume of remaining solid at $x=8$ inch.

(iii) Use the polynomial to determine the volume at $x=8$ inch and verify the result in (ii).

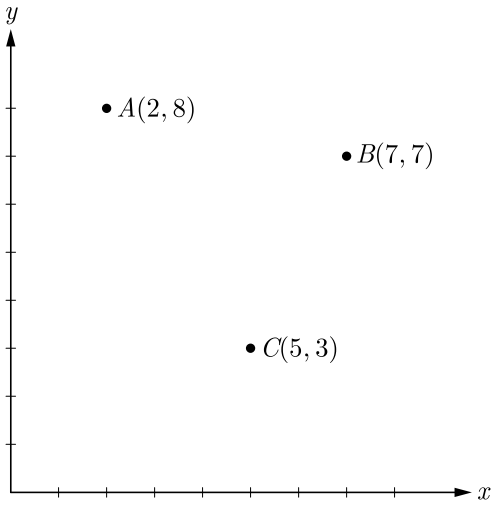
OR

(iv) Use the remainder theorem to determine the volume at $x=10$ inch.

37. Carpooling : It is the sharing of car journeys so that more than one person travels in a car and prevents the need for others to have to drive to a location themselves. By having more people using one vehicle, carpooling reduces each person's travel costs such as: fuel costs, tolls and the stress of driving. Carpooling is also a more environmentally friendly and sustainable way to travel as sharing journeys reduces air pollution, carbon emissions, traffic congestion on the roads, and the need for parking spaces.



Three friends Amar, Bandhu and Chakradev lives in societies represented by the points A, B and C respectively. They all work in offices located in a same building represented by the point O. Since they all go to same building everyday, they decided to do carpooling to save money on petrol. Based on the above information, answer the following questions.



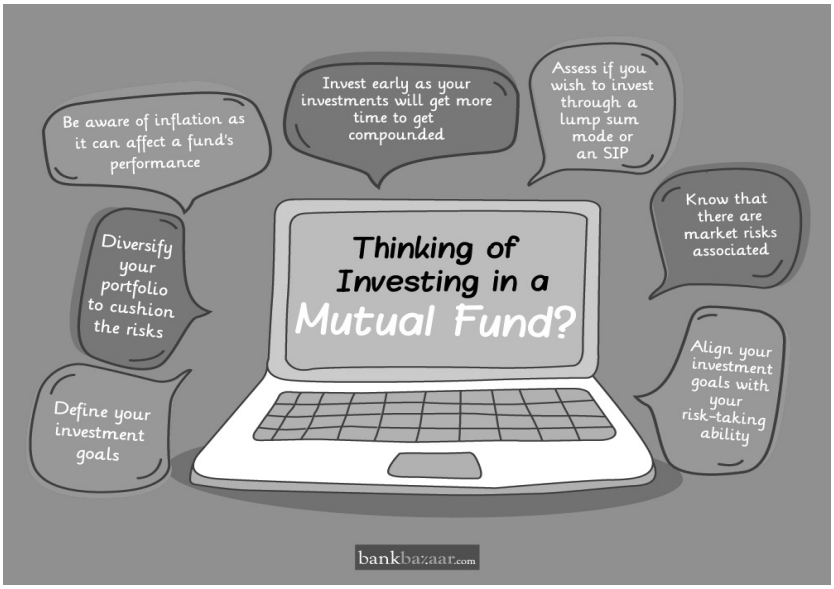
(i) Which society is nearest to the office?

(ii) What is the distance between A and C?

(iii) Find the least distance between AB, OA and BC ?

(iv) If Bandhu and Chakradev planned to meet at a club situated at the mid-point of the line joining the points B and C, find the coordinates of this point.

38. Mutual Fund : A mutual fund is a type of financial vehicle made up of a pool of money collected from many investors to invest in securities like stocks, bonds, money market instruments, and other assets. Mutual funds are operated by professional money managers, who allocate the fund's assets and attempt to produce capital gains or income for the fund's investors.



Net asset value (NAV) represents a fund's per share market value. It is the price at which investors buy ("bid price") fund shares from a fund company and sell them ("redemption price") to a fund company. The following table below shows the net asset value (NAV) per unit of mutual funds of ICICI mutual funds.

NAV (Rs)	No. of mutual funds
0-5	13
6-10	16
11-15	22
16-20	18
21-25	11

Based on the above information, answer the following questions.

(i) What is the lower limit of model class of NAV?

(ii) What is the mode NAV of mutual funds ?

(iii) What is the mean NAV of mutual funds ?]

OR

(iv) What is the median NAV of mutual funds ?

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