AP SUPER GURU MODEL TEST PAPER – 5

MATHEMATICS (UNSOLVED)

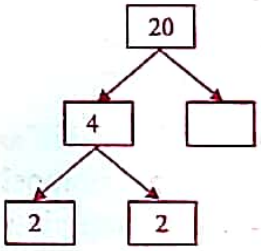
Time Allowed : 3 Hours | CLASS – X | Maximum Marks : 80

Note

1. All questions are compulsory.
2. Part 'A' has 1 to 3 Questions.
   (*i*) Que. No. 1 consists of 16 Multiple Choice Questions carrying 1 mark each.
   (*ii*) Que. No. 2 consists of 7 True/False type questions carrying 1 mark each.
   (*iii*) Que. No. 3 consists of 7 Fill in the blanks type questions with options carrying 1 mark each.
3. Part 'B' contains question No. 4 to 7 of 2 marks each.
4. Part 'C' contains question no. 8 to 13 of 4 marks each. Any three questions of these questions have internal choice. Question 12 or part will be of case study.
5. Part 'D' contains Questions no. 14 to 16 each of 6 marks. All these questions have internal choice.

PART–A

1. Choose the correct option. Each question carries 1 marks.

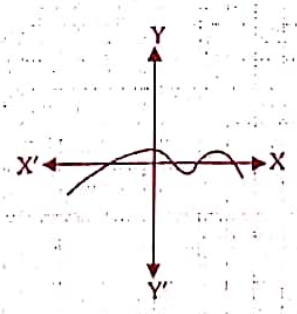


(*i*) What will be the unknown number in the prime factorization tree?
(*a*) 5 (*b*) 4 (*c*) 3 (*d*) 2

(*ii*) If $p(x) = 2x^2 + 4x + 5$ is a quadratic polynomial then what is the value of product of zeroes?

(*a*) 0 (*b*) $\frac{5}{2}$ (*c*) 5 (*d*) 2

(*iii*) How many zeroes are there of the polynomial $y = p(x)$ in the given figure.



(*a*) 3 (*b*) 9 (*c*) 4 (*d*) 5

(*iv*) What is the formula of total surface area of a hemisphere?
(*a*) $2\pi r$ (*b*) πr^2 (*c*) $3\pi r^2$ (*d*) $2\pi r^2$

(*v*) What will be the solution of pair of linear equations $x - 2y = 0$ and $3x + 4y = 20$?
(*a*) (0, 5) (*b*) (0, 0) (*c*) (2, 1) (*d*) (4, 2)

(*vi*) If the roots (zeroes) of quadratic equation $ax^2 + bx + c = 0$ are equal then :

(*a*) $D = 0$ (*b*) $D > 0$ (*c*) $D < 0$ (*d*) $D \geq 0$

(*vii*) What is the next term of A.P. 2, 0, –2, –4 .....

(*a*) –2 (*b*) –4 (*c*) –6 (*d*) –8

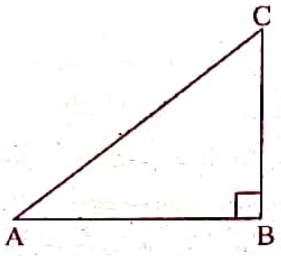
(*viii*) What are the coordinates of point lying on *y-axis*?

(*a*) (*a*, 0) (*b*) (0, *a*) (*c*) (–*a*, *a*) (*d*) (*a*, –*a*)

(*ix*) If '*l*' is the slant height, r is radius of base and 'h' is the height of a cone. What is area of base of cone?

(*a*) πrl (*b*) $\frac{1}{3}\pi r^2 h$ (*c*) πr^2 (*d*) $3\pi r^2$

(*x*) What is the value of sin A from the given ΔABC?

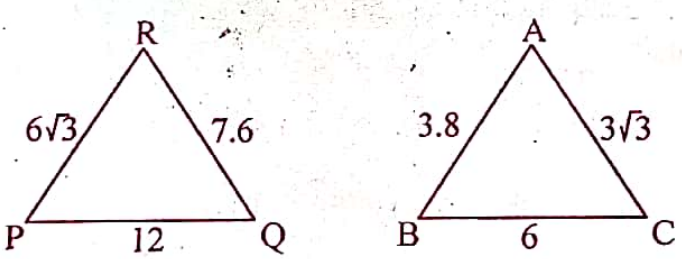


(*a*) $\frac{BC}{AC}$ (*b*) $\frac{BC}{AB}$ (*c*) $\frac{AC}{AB}$ (*d*) $\frac{AC}{BC}$

(*xi*) If the HCF of two numbers is 1, then the two numbers are called :

(*a*) Composit (*b*) Coprime (*c*) Rational (*d*) Irrational

(*xii*) By studying the given figure choose the right option :



(*a*) $\Delta RPQ \sim \Delta ABC$ (*b*) $\Delta RQP \sim \Delta ACB$ (*c*) $\Delta RPQ \sim \Delta ACB$ (*d*) None of these

(*xiii*) If perimeter and area of a circle are numerically equal then radius of circle will be :

(*a*) 2 units (*b*) π units (*c*) 4 units (*d*) 5 units

(*xiv*) The wickets taken by a bowler in 10 cricket matches are as follows :
2, 6, 4, 5, 0, 2, 1, 3, 2, 3 Find the mode of the data.

(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4

(*xv*) What is the probability of an impossible event?

(*a*) 1 (*b*) 2 (*c*) 0 (*d*) $\frac{1}{2}$

(*xvi*) Sides of triangles are given below. Which of these is a right angled triangle?

(*a*) 3 cm, 4 cm, 7 cm (*b*) 34 cm, 30 cm, 16 cm

(*c*) 8 cm, 10 cm, 12 cm (*d*) 5 cm, 7 cm, 9 cm

2. **Choose the True/False. Each question carries 1 marks.**
   (*i*) If a pair of linear equation is inconsistent then the lines will be parallel. (True/False)
   (*ii*) $3x^2 + 2x - 5 = 0$ is not a quadratic equation. (True/False)
   (*iii*) Common difference of A.P. 2, 2, 2,..... is 2. (True/False)
   (*iv*) The co-oridnates of point lies on x-axis are (a, 0) (True/False)
   (*v*) Value of cot A increases as $\angle A$ increases. (True/False)
   (*vi*) If $P(\bar{E})$ denote the probability of not an event E then $P(E) + (P(\bar{E}) = 1$ (True/False)
   (*vii*) Two tangents lines can be drawn from a point that lying on the circle. (True/False)
3. **Fill in the blanks. Each question carries 1 marks.**
   (*i*) If a pair of linear equation is consistent then the lines will be .....
   (*ii*) All squares are .....
   (*iii*) The distance of the point P(2, 3) from the Y-axis is .....,
   (*iv*) Length of arc of a circle having radius 'R' and central angle P° is.....
   (*v*) The ratio of volume of cone and a cylinder having same height and same radius is .....
   (*vi*) Which of the following is not a measure of central tendency of a statistical data?
   (*vii*) A die is tossed one time. The probability of getting a prime number is .....

PART–B

Note : Each question has 2 marks.

4. If LCM(306, 657) = 22338 then find HCF (306, 657)
5. Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$ and verify the relationship between the zeroes and the co-efficients.
6. The length of the minute hand of a clock is 14cm. Find the area swept by the minute hand in 5 minutes.
7. A lot of 20 bulbs contain 4 defective bulbs. One bulb is drawn at random from the lot. What is the probability that this bulb is not defective?

PART–C

Note : Each question has 4 marks.

8. Solve the quadratic $2x^2 - 6x + 3 = 0$ by completing the square method.

Or

Find the roots of the equation $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{13}$ here $x \neq -4, 7$.

9. How many terms of the AP 24, 21, 18, ... must be taken so that their sum is 78?

Or

Match the following.

(*i*) n^{th} term of an A.P. $a_{n+1} - a_n$
(*ii*) Sum of first '*n*' terms of an A.P. $a + (n-1)d$
(*iii*) Common Difference $a + 4d$
(*iv*) 5th term of an A.P. $\frac{n}{2}[2a + (n-1)d]$

10. Prove that the points (5, –2), (6, 4) and (7, –2) are the vertices of an isosceles triangle.

11. Prove that $\cos\left(\frac{B+C}{2}\right) = \sin\frac{A}{2}$ If A, B and C are interiar angles of ΔABC.

12. A tree breaks due to storm and the broken part bends in such a way that the top of the tree touches the ground making an angle 30° with it. The distance between the foot of the tree to the point where the top touches the ground is 8m. Find the height of the tree.

13. A toy is in the form of a cone of a radius 3.5cm mounted on a hemisphere of same radius. The total height of the toy is 15.5cm. Find the total surface area of the toy. **Or**
A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2cm and the diameter of the base is 4cm. Determine the value of the toy. If a right circular cylinder circumscribes the toy find the difference of the volume of the cylinder and the toy.
(Take $\pi = 3.14$)

PART–D

Note : Each question carries 6 marks.

14. Solve the pair of linear equations $2x + 3y = 13$ and $3x + 5y = 21$ by the method of elimination of y.

Or

A cricket cotch bought 7 balls and 6 balls for Rs. 3800. Later on the bought 3 bats and 5 balls for Rs. 1750. Find the cost of each bat and and each ball.

15. ABCD is a trapezium with AB||BC. E and F are points on non-parallel sides AD and BC respectively such that EF is parallel to AB. Show that $\frac{AE}{ED} - \frac{BF}{FC}$.

Or

A quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB + CD = AD + BC.

16. The distribution below gives the weight of 30 students of a class. Find the mean weight by using step deviation method.

Weight (in kg)	40-45	45-50	50-55	55-60	60-65	65-70	70-75
No. of students	2	3	8	6	6	3	2

Or

The table below shows the daily expenditure on food of 25 households in a locality. Find the median of daily expenditure on food.

Daily expenditure (in Rs.)	100-150	150-200	200-250	250-300	300-350
No. of households	4	5	12	2	2

Answers of Multiple Choice Questions

1. (*i*) (*a*), (*ii*) (*b*), (*iii*) (*c*), (*iv*) (*c*), (*v*) (*d*), (*vi*) (*a*), (*vii*) (*c*), (*viii*) (*b*), (*ix*) (*d*), (*x*) (*a*), (*xi*) (*b*), (*xii*) (*a*), (*xiii*) (*a*), (*xiv*) (*b*), (*xv*) (*c*), (*xvi*) (*b*) **2.** (*i*) True, (*ii*) True, (*iii*) False, (*iv*) True, (*v*) True, (*vi*) True, (*vii*) False **3.** (*i*) always parallel, (ii) Similar, (*iii*) 2, (*iv*), $\frac{P^\circ}{180} \times \pi R$, (*v*) Range,(*vi*) , (*vii*) $\frac{1}{2}$.