AP SUPER GURU MODEL TEST PAPER – 2

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*) How many zeroes of a quadratic equation has?
(*a*) 0 (*b*) 1 (*c*) 2 (*d*) 3

(*ii*) How many solutions of equation $2x - 5y = K$ have?
(*a*) One (*b*) Two (*c*) Infinite (*d*) None of these

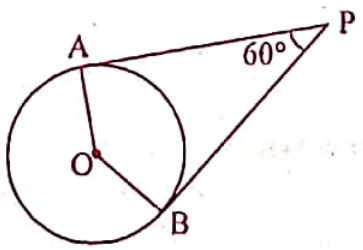
(*iii*) Which of the following equation is a linear equation in two variables?
(*a*) $4x^2 - 3x = 5$ (*b*) $2x + 4y + 7 = 0$
(*c*) $4x^2 - 3x + 5 = 0$ (*d*) $ax^2 + bx + c$

(*iv*) Check which of the following is a zero of quadratic equation $x^2 + 5x - 6 = 0$:
(*a*) 2 (*b*) 3 (*c*) 1 (*d*) 0

(*v*) 10th term of AP 3, 7, 11..... will be?
(*a*) 46 (*b*) 39 (*c*) 41 (*d*) 50

(*vi*) The ratio of corresponding sides of two similar triangles is 4 : 9. What is the ratio of their perimeters?
(*a*) 4 : 9 (*b*) 2 : 3 (*c*) 16 : 81 (*d*) None of these

(*vii*) If PA and PB are tangents of a circle of centre 'O' such that $\angle APB = 60°$ then value of $\angle AOB$ is :



(*a*) 60° (*b*) 100° (*c*) 120° (*d*) 180°

(*viii*) The distance of pt A(–3, –2) from *x*-axis is :

(*a*) –2 (*b*) 2 (*c*) 3 (*d*) –3

(*ix*) For any two positive integers 'a' and 'b', which of the statement is true?

(*a*) HCF (a,b) × LCM (a, b) = a + b (*b*) HCF (a,b) × LCM (a, b) = a × b

(*c*) HCF (a,b) × LCM (a, b) = a – b (*d*) HCF (a,b) × LCM (a, b) = a ÷ b

(*x*) $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - \operatorname{cosec}\theta) =$ .....

(*a*) 2 (*b*) 0 (*c*) –1 (*d*) 1

(*xi*) If the perimeter of a circle is equal to the perimeter of a square then the ratio of their area is .....

(*a*) 22 : 7 (*b*) 14 : 11 (*c*) 7 : 22 (*d*) 11 : 14

(*xii*) What is the total surface area of hemisphere of radius '*r*' ?

(*a*) πr^2 (*b*) $2\pi r^2$ (*c*) $3\pi r^2$ (*d*) $4\pi r^2$

(*xiii*) Which of the following number is irrational number?

(*a*) $\sqrt{4}$ (*b*) $\sqrt{25}$ (*c*) $\sqrt{5}$ (*d*) 1.6

(*xiv*) Median of numbers 4, 15, 19, 21, 6 is :

(*a*) 4 (*b*) 6 (*c*) 15 (*d*) 19

(*xv*) An ice-cream cone is a combination of which of the following figures :

(*a*) Sphere + Cylinder (*b*) Sphere + Cone

(*c*) Hemisphere + Cylinder (*d*) Hemishpere + Cone

(*xvi*) Probability of ..... event is zero.

(*a*) Impossible (*b*) Possible (*c*) All (*d*) None of these

2. Choose the True/False. Each question carries 1 marks.

(*i*) Maximum power of a qudratic equation is 3. (True/False)

(*ii*) The qudratic equation $4x^2 - 5x + 6 = 0$ has real and repeated roots. (True/False)

(*iii*) Common difference of A.P. 3, 8, 13, 18 is 5. (True/False)

(*iv*) If $\Delta ABC \sim \Delta PQR$ then $\frac{AB}{PQ} = \frac{BC}{PR}$. (True/False)

(*v*) If P (*k*, 4), is the mid point of line segment joining the points A (–6, 5) and B(–2, 3) then the value of *k* is –4. (True/False)

(*vi*) $\frac{1+\tan^2 A}{1+\cot^2 A} = \tan^2 A$ (True/False)

(*vii*) A die is tossed one time. The probability of an odd number is $\frac{1}{3}$. (True/False)

3. Fill in the blanks. Each question carries 1 marks.

(*i*) If two graph lines intersect at a point then the linear equation has ..... solution.

(*ii*) All equilateral triangles are .....

(*iii*) $\frac{1+\sin A}{\cos A} =$ .....

(*iv*) Perimeter of semicircle is .....

(*v*) Total surface area of cube is .....

(*vi*) ..... is the observation which comes maximum time.

(*vii*) Probability of an event lies between ..... and .....

PART–B

Note : Each Question carries 2 marks.

4. Find the HCF of 45, 36 and 63 by factorization method.

5. Find a quadratic polynomial whose zeroes are $-\frac{1}{4}$ and $\frac{1}{4}$.

6. Two circles has radius 6cm and 8cm respectively. Find the radius of circle whose perimeter is equal to the sum of perimeter of given circles.

7. One die is thrown once. Find the probability of the following.

   (i) an even number *(ii)* number more than 2.

PART–C

Note : Each question carries 4 marks.

8. A train travels 360 km at a uniform usual speed. If the speed had been 5km/h more, it would have taken 1 hour less for the same journey. Find the usual speed of the train.

   Or

   If the roots of quadratic equation $2x^2 - 7x + 3 = 0$ are possible then find the roots by using quadratic formula.

9. Find the sum of A.P. ..... $7 + 10\frac{1}{2} + 14 +$ .....$+ 84$.

10. Check whether the points (5,1), (3, 2) and (–11, –2) are collinear or not?

11. Prove that : $\frac{\cos A}{1+\sin A} + \frac{1+\sin A}{\cos A} = 2\sec A$

12. The angle of elevation of the top of a tower from a point on the ground, which is 30m away from the foot of the tower is 30°. Find the length of the tower.

    Or

    The angle of elevation of the top of a tower from two points at distance of 4m and 9m from the base of the tower and in the same straight line with it are complementary. Prove that the height of tower is 6m.

13. If the ratio of volume of two sphere is 64 : 27 then find the ratio of their surface area.

    Or

    How many silver coins 1.75cm in diameter and 2mm thickness must be melted to form a cuboid of dimensions 5.5cm × 10cm × 3.5cm?

PART–D

Note : Each question carries 6 marks.

14. Solve the pair of equations:

$\frac{3x}{2}-\frac{5y}{3}=-2$ and $\frac{x}{3}+\frac{y}{2}=\frac{13}{6}$ by elimination method.

Or

A fraction becomes $\frac{9}{11}$ if 2 is added to both the numerator and the denominator. If 3 is added to both the numerator and denominator it becomes $\frac{5}{6}$. Find the fraction.

15. Sides AB and BC and median AD of a triangle ABC are respectively proportional to sides PQ and QR and median PM of ΔPQR. Show that $\Delta ABC \sim \Delta PQR$.

Or

Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$.

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

Daily expenditure (in Rs.)	50-100	100-150	150-200	200-250	250-300
No. of households	4	5	12	2	2

Find the mean of daily expenditure on food by using assumed.

Or

The distribution below gives the weights of 30 students of a class. Find the median weight of the students.

Weight (in kg)	45-50	50-55	55-65	60-65	65-70	70-75	75-80
No. of students	2	3	8	6	6	3	2

Answers of Multiple Choice Questions

1. (*i*) (*c*), (*ii*) (*c*), (*iii*) (*b*), (*iv*) (*c*), (*v*) (*b*), (*vi*) (*a*), (*vii*) (*c*), (*viii*) (*a*), (*ix*) (*b*), (*x*) (*a*), (*xi*) (*d*), (*xii*) (*c*), (*xiii*) (*c*), (*xiv*) (*c*), (*xv*) (*d*), (*xvi*) (*a*)

2. (*i*) False, (*ii*) False, (*iii*) True, (*iv*) False, (*v*) True, (*vi*) False, (*vii*) False

3. (*i*) One, (*ii*) Similar, (*iii*) $\sec\theta + \tan\theta$, (*iv*) $\pi r + d$, (*v*) $(\text{side})^2$, (*vi*) Mode, (*vii*) 0 and 1