AP SUPER GURU MODEL TEST PAPER – 3

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*) Which of the following is not a rational number :

(*a*) $\sqrt{5}$ (*b*) $\sqrt{4}$ (*c*) $\sqrt{9}$ (*d*) 0.2

(*ii*) Which of the following is a linear polynomial :

(*a*) $ax^2 + b$ (*b*) $ax + b$ (*c*) $ax^3 + bx^2 + c$ (*d*) $ax^2 + bx + c$

(*iii*) Zeroes of polynomial $x^2 - 9$ are :

(*a*) 0, 3 (*b*) 3, 0 (*c*) 3, – 3 (*d*) 9, –9

(*iv*) Linear equation $2x + 5y = 7$ has how many solutions?

(*a*) Only one (*b*) Only two (*c*) Infinite (*d*) No solution

(*v*) Which of the following is a linear equation in two variables?

(*a*) $4x - 3 = 0$ (*b*) $5x - 3y = 7$ (*c*) $3x^2 + 5x - 9 = 0$ (*d*) None of these

(*vi*) The equation $ax^2 + bx + c = 0$ has real and distinct roots if :

(*a*) D = 0 *b*) D < 0 (*c*) D > 0 (*d*) D ≥ 0

(*vii*) If in an A.P., a = 10 and d = 10 then what will be 10th term?

(*a*) 100 (*b*) 90 (*c*) 101 (*d*) 110

(*viii*) If in ΔABC, $AC^2 = AB^2 + BC^2$ then which of the angle is a right angle?

(*a*) $\angle A$ (*b*) $\angle B$

(*c*) $\angle C$ (*d*) None of these

(*ix*) If TP and TQ are tangents to the circle of centre O such that $\angle POQ = 120°$ such then $\angle PTQ$ will be :

(*a*) 40° (*b*) 50° (*c*) 60° (*d*) 70°

(*x*) Which of the following triangles are similar?

(*a*) Equilateral Triangles (*b*) Isosceles Triangles

(*c*) Scalence Triangle (*d*) None of these

(*xi*) If A, B and C are interior angles of ΔABC then $\cos\left(\frac{B+C}{2}\right)$ is equal to :

(*a*) $-\sin\left(\frac{A}{2}\right)$ (*b*) $\cos\left(\frac{A}{2}\right)$ (*c*) $\sin\left(\frac{A}{2}\right)$ (*d*) $-\cos\left(\frac{A}{2}\right)$

(*xii*) Which of the following is the standard form of a quadratic equation :

(*a*) $ax^2 + bx + c = 0$ (*b*) $ax^2 - bx - c = 0$

(*c*) $bx^2 - cx + a = 0$ (*d*) $cx^2 + ax + b = 0$

(*xiii*) What is the area of largest triangle drawn in a semi circle of radius 'r' units?

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

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

(*a*) $4\pi r^2$ (*b*) $2\pi r^2$ (*c*) $3\pi r^2$ (*d*) $\frac{4}{3}\pi r^2$

(*xv*) What is the median of numbers 15, 4, 19, 6, 21?

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

(*xvi*) A dice is thrown twice. Find the probability that 5 will not come any time.

(*a*) $\frac{25}{36}$ (*b*) $\frac{11}{36}$ (*c*) $\frac{13}{36}$ (*d*) $\frac{5}{36}$

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

(*i*) $7x - 5y = 2$ is a equation in two variables. (True/False)

(*ii*) If n^{th} term of an A.P. is $a_n = 3 + 4n$ then its common difference is 3. (True/False)

(*iii*) The distance of point (2, 4) from the x-axis is 4. (True/False)

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

(*v*) If each side of an equilateral triangle is 'a' then its area is $\frac{\sqrt{3}}{4}a^2$ units. (True/False)

(*vi*) Circumfrence of semicircle is πr. (True/False)

(*vii*) If $P(E) = 0.092$ then $P(\bar{E}) = 0.008$. (True/False)

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

(*i*) If graph lines of two equations are parallel the pair of equations has ..... solutions.

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

(*iii*) Distance of point P(5, –7) from the origin is .....

(*iv*) Sin 60° = ...

(*v*) Total surface area of cylinder = ...

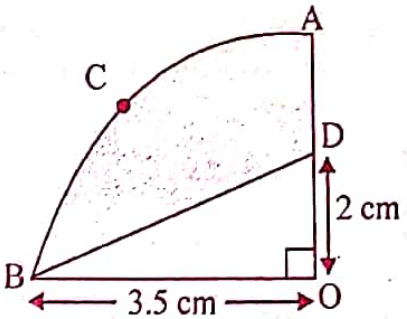
(*vi*) If 10 is the mean of x, $x + 3$, $x + 6$, $x + 9$ and $x + 12$ then value of x is .....

(*vii*) Probability of an impossible event is .....

PART–B

Note : Each Question carries 2 marks.

4. Prove that $\sqrt{5}$ is a irrational number.
5. Find a quadratic polynomial whose zeroes are –3 and –2.
6. In fig. OACB is a quadrant of a circle with centre 'O' and radius 3.5cm. If OD = 2cm, Find the area of the.
   (*i*) Quadrant OACB (*ii*) Shaded region
7. Two dices are thrown simultaneously. What is the probability that (a) sum of numbers on two dices is *(i)* 8 and *(ii)* 13.



PART – C

Note : Each question carries 4 marks.

8. Solve the equation $\frac{1}{x-3}+\frac{1}{x+5}=\frac{1}{3}$.

Or

Difference of two numbers is 180. Square of small number is equal to eight times the larger number. Find the numbers.

9. Find the sum of first 51 terms of an A.P. whose second and third terms are 14 and 18 respectively.

Or

How many terms are there in A.P. 7, 13, 19.....,205.

10. Find the value of 'Y' such that the distance between the points A(2, –3) and B(10, y) is 10 units.

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

12. An observer 1.5m tall is 28.5m away from a chimney. The angle of elevation of the top of the chimney from her eye is 45°. What is the height of the chimney?

Or

Match the following.

$\sin(90°-\theta)$	$\sin\theta$
$\cos 0°$	0
$\sin 0°$	1
$\cos(90°-\theta)$	$\cos\theta$

13. From a solid cylinder whose height is 2.4cm and diameter 1.4cm a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2.

Or

A pen stand made of wood is in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid are 15cm by 10cm by 3.5 cm. The radius of each of the depressions is 0.5cm and depth is 1.4cm. Find the volume of wood in the entire stand.

PART–D

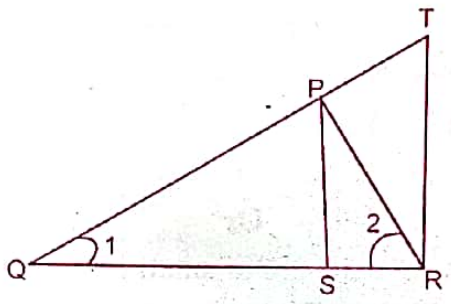
Note : Each question carries 6 marks.

14. Solve the pair of linear equations $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of 'm' for which $y = mx + c$.

Or

If we add 1 in numerator and denominator of a fraction than it becomes 1. It is becomes $\frac{1}{2}$ if we add 1 in denominator only. Find the fraction.

15. In the given figure $\frac{QR}{QS} = \frac{QT}{PR}$ and $\angle 1 = \angle 2$. Show that $\Delta PQS \sim \Delta TQR$.



Or

Prove that the parallelogram circumscribing a circle is a rhombus.

16. A survey regarding the heights (in cm) of 51 girls of class X of a school was conducted and the following data was obtained. Find the median height.

Height (in cms.)	Less than 140	Less than 145	Less than 150	Less than 155	Less than 160	Less than 165
No. of girls	4	11	29	40	46	51

Or

The following data gives the information gives life time observed (in hours) of 225 electric components.

Life time (in hours)	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	10	35	52	61	38	29

Find the mode of the equipments.

Answers of Multiple Choice Questions

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

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

3. (*i*) 1, (*ii*) Equilateral, (*iii*) $\sqrt{74}$, (*iv*) $\frac{\sqrt{3}}{2}$, (*v*) $2\pi r (r + h)$, (*vi*) 4, (*vii*) 0