AP SUPER GURU MODEL TEST PAPER – 6

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 is the HCF of two co-prime numbers?

(*a*) 1 (*b*) 0 (*c*) 2 (*d*) 3

(*ii*) What is the sum of zeroes of polynomial $ax^2 + bx + c$.

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

(*iii*) Pair of linear equation has a unique solution if :

(*a*) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ (*b*) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ (*c*) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ (*d*) None of these

(*iv*) For what value of '*K*', the equation $2x^2 + kx + 3 = 0$ has two equal roots.

(*a*) $\pm\sqrt{6}$ (*b*) $\pm 3\sqrt{2}$ (*c*) ± 4 (*d*) $\pm 2\sqrt{6}$

(*v*) In an A.P. if $a = 28$, $d = -4$ and $n = 7$ then, What is a_n ?

(*a*) 4 (*b*) 5 (*c*) 6 (*d*) 8

(*vi*) If the ratio of corresponding sides of two similar triangle is 4 : 9 then will the ratio of their area:

(*a*) 2 : 3 (*b*) 16 : 81 (*c*) 81 : 16 (*d*) 4 : 9

(*vii*) How many tangents to a circle can be drawn from an external point?

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

(*viii*) What is the value of '*x*', if the distance between the points (2, –2) and (–1, x) is 5 units?

(*a*) –2 (*b*) 1 (*c*) –1 (*d*) 2

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(ix) Sin 2B = 2 sin B when B is equal to :
(a) 0 (b) 30° (c) 45° (d) 60°

(x) If area of circle of radius R is equal to the sum of areas of circle of radii R_1 and R_2 then :
(a) $R = R_1 + R_2$ (b) $R^2 = R_1^2 + R_2^2$
(c) $R^2 = R_1^2 - R_2^2$ (d) $R = R_1 - R_2$

(xi) If the ratio of areas of two sphere is 16 : 9 then the ratio of their volume is :
(a) 4 : 3 (b) 27 : 64 (c) 64 : 27 (d) None of these

(xii) If we recast a sphere into the shape of a cylinder then the volume of cylinder :
(a) Increases (b) Decreases
(c) Becomes double (d) None of these

(xiii) Mean of 100 numbers is 50. But later on it is observed that an observation 50 by mistake is written as 150. What is the new mean?
(a) 49 (b) 50 (c) 51 (d) 52

(xiv) Mean of marks obtained by 10 students is 32. If each student got 5 marks more then what is the new mean?
(a) 32 (b) 37 (c) 27 (d) 50

(xv) Two dices are thrown simultaneously. What is the probability of getting 13 as sum of number?
(a) 1 (b) $\frac{5}{12}$ (c) 0 (d) None of these

(xvi) Which of the following is true, for real and distinct root of quadratic equations $ax + bx + c = 0$:
(a) D = 0 (b) D < 0 (c) D ≥ 0 (d) D > 0

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

(i) A linear polynomial has 2 zeroes. (True/False)
(ii) Value of *Y* for equations $x + y = 14$ and $x - y = 4$ is 5. (True/False)
(iii) Every composit number can be represented as the product of prime factors. (True/False)
(iv) If a, b, c, d are in A.P. then b–a = c–d. (True/False)
(v) Tangents drawn to a circle from an external point are parellel. (True/False)
(vi) If $\sin\theta + \sin^2\theta = 1$ then $\cos^2\theta + \cos\theta = 1$. (True/False)
(vii) One dice is thrown once. The probability of getting a composit number is $\frac{1}{2}$. (True/False)

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

(i) Linear equation $5x + 3y = K$ has ..... solutions.
(ii) Common point of a circle and its tangent is called .....
(iii) If area of a triangle is ..... units then its vertices are collinear.
(iv) If $\tan\theta = \frac{a}{b}$ then $\cot\theta$ = ...
(v) Area of sector of circle of radius '*r*' is .....
(vi) Perimeter of a semicircle is .....
(vii) The probability of getting a vowel in the word PROBABILITY is .....

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PART–B

Note : Each Question carries 2 marks.

4. Prove that $\sqrt{2}$ is irrational.
5. Find the zeroes of the polynomial $x^2 - 3$ and verify the relationship between the zeroes and the coefficients.
6. If the length of tangent from a point A which is 5cm away from the centre of circle is 4cm, find the radius of circle.
7. 12 defective pens are accidently mixed with 132 good pens. It is not possible to just look at a pen and tell whether or not it is defective. One pen is taken out of random from its lot. Determine the probability that the pen taken out is a defective one.

PART – C

Note : Each Question carries 4 marks.

8. Find two consecutive odd positive integers, sum of whose squares is 290.
9. Find the common difference of an A.P. whose 17th term is 7 more that its 10th term.

Or

Find the sum of odd numbers between 0 to 50.

10. Find the co-ordinates of point A if AB is the diameter of a circle whose centre is (2, –3) and the co-ordinates of B are (1, 4)
11. Prove that $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$ **Or**

Find the value of $\frac{\sin 30° + \tan 45° - \operatorname{cosec} 60°}{\sec 30° + \cos 60° + \cot 45°}$

12. Two poles of equal heights are standing opposite to each other on either side of the road, which is 80m wide. From a point between them on the road, the angle of elevation of the top of the poles are 60° and 30° respectively. Find the height of the pole and the distances of the point from the poles.
13. A wooden article was made by scooping out a hemisphere from each of a solid cylinder. If the height of the cylinder is 10cm and its base is of radius 3.5cm, find the total surface area of the article.

Or

A cointainer shaped like a right circular cylinder having diameter 12cm and height 15cm is full of the ice cream. The ice cream is to be filled into cones of height 12 cm and diameter 6cm, having a hemispherical shape on the top. Find the number of such cones which can be filled with ice-cream.

PART–D

Note : Each question carries 6 marks.

14. Solve the following pair of equations graphically.
$2x + 3y = 11$ and $2x - 4y = -24$ **Or**

The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditure is 4 : 3. If each of them manages to save Rs. 2000 per month, find their monthly incomes.

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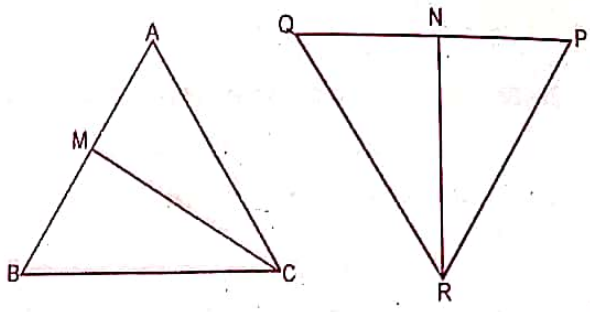
15. In the given figure, CM and RN are respectively the median of ΔABC and ΔPQR. If $\Delta ABC \sim \Delta PQR$, prove that:

(i) $\Delta AMC \sim \Delta PNR$

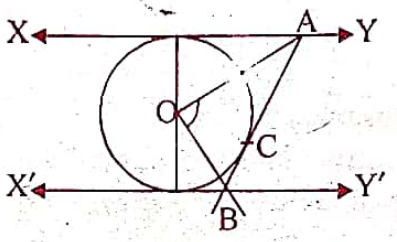
(ii) $\frac{CM}{RN} = \frac{AB}{PQ}$

(iii) $\Delta CMB \sim \Delta RNQ$



Or

In the adjacent figure XY and X′Y′ are two parallel tangents to a circle with the cetnre O and another tangent AB with point of contact C intersectintg XY at A X′Y′ at B. Prove that $\angle AOB = 90°$.



16. The following distribution shows the daily pocket allowance of children of a locality.The mean pocket allowance is Rs. 18. Find the missing frequency of :

Daily pocket allowance	11-13	13-15	15-17	17-19	19-21	21-23	23-25
Number of children	7	6	9	13	f	5	4

Or

The following table shows the age of the patients admitted in a hospital during a year.

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of patients	6	11	21	23	14	5

Find the mode of the data given above.

Answers of Multiple Choice Questions

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

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

3. (*i*) infinite, (*ii*) Point of contact, (*iii*) 0, (*iv*) $\frac{b}{a}$, (*v*) $\frac{\pi r^2 0}{360}$, (*vi*) $\pi r + d$, (*vii*) $\frac{4}{11}$

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