AP SUPER GURU MODEL TEST PAPER – 4

MATHEMATICS (UNSOLVED)

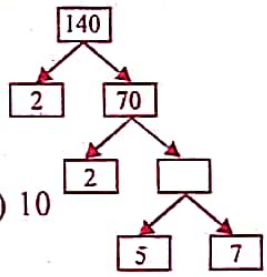
Time Allowed : 3 Hours | CLASS – X | Maximum Marks : 80

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*) Complete the factor tree

(*a*) 5 (*b*) 7 (*c*) 35 (*d*) 10

(*ii*) How many maximum number of zeroes a cubic polynomial has?

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

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

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

(*iv*) Which of the following equations is a quadratic equation.

(*a*) $x^3 - 3x^2 + 1 = 4x^3 + 7$ (*b*) $(x-1)(x^2-3) = 0$

(*c*) $(x-2)^3 = 3x^3 + 3x + 5$ (*d*) $x + \frac{1}{x} = 9$

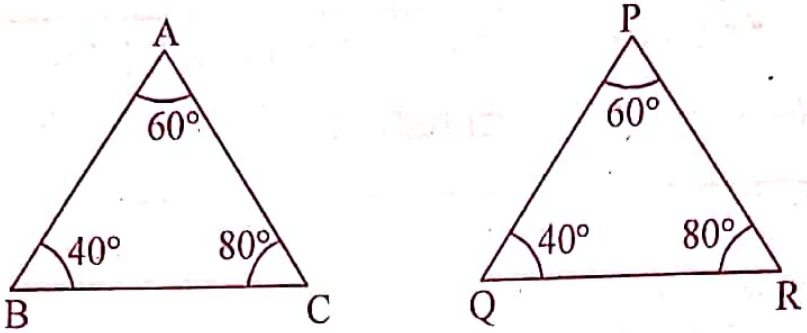
(*v*) What is the sum of first 'n' odd natural numbers?

(*a*) n^2 (*b*) $\frac{n(n+1)}{2}$ (*c*) $\frac{n(n-1)}{3}$ (*d*) None of these

(*vi*) Which of the following is not a criteria of congruency of two triangles?

(*a*) S.S.S = S.S.S. (*b*) A.S.S = A.S.S. (*c*) SAS = S.A.S. (*d*) A.S.A = A.S.A.

(*vii*) By which criteria the following triangles are similar :



(*a*) A-A-A (*b*) S-S-S (*c*) S-A-S (*d*) None of these

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

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

(*ix*) If (4, K) is the mid point of line joining the points A (3, 5) and B (5, 7) then the value of 'K' is:

(*a*) 3 (*b*) 6 (*c*) 5 (*d*) 4

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

(*a*) 0 (*b*) 1 (*c*) 2 (*d*) –1

(*xi*) What is the formula of volume of a sphere of radius '*r*'?

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

(*xii*) What is the radius of a circle whose area is equal to the sum of areas of circles of radius 24cm and 7cm :

(*a*) 31 cm (*b*) 25cm (*c*) 17 cm (*d*) None of these

(*xiii*) If ratio of volume of two spheres is 64 : 27 then the ratio of their area is :

(*a*) 8 : 9 (*b*) 4 : 7 (*c*) 16 : 9 (*d*) 9 :8

(*xiv*) What is the probability of getting a vowel in english alphabet?

(*a*) $\frac{5}{26}$ (*b*) $\frac{3}{26}$ (*c*) $\frac{21}{26}$ (*d*) None of these

(*xv*) Probability of ..... event is 1.

(*a*) Impossible (*b*) Sure (*c*) Both (a) and (b) (*d*) None of these

(*xvi*) When one coin is thrown once then the probability of getting a head is :

(*a*) $\frac{1}{2}$ (*b*) $\frac{1}{3}$ (*c*) $\frac{1}{5}$ (*d*) $\frac{1}{4}$

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

(*i*) $\sqrt{16}$ is a irrational number. (True/False)

(*ii*) Value of y is 6 for the pair of equations $x + y = 14$ and $x - y = 6$. (True/False)

(*iii*) Diagonal of a square of side 6cm is $6\sqrt{2}$. (True/False)

(*iv*) Distance of point (–6, 5) from the y-axis is 61. (True/False)

(*v*) $\sec^2\theta + \tan^2\theta = 1$ (True/False)

(*vi*) Area of circle of radius 10cm is $314cm^2$. (True/False)

(*vii*) $\frac{1}{3}\pi r^2 h$ is the formula of curved surface area of cone. (True/False)

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

(*i*) If $p(x) = ax^2 + bx + c$ then $\frac{c}{a}$ is a ..... of zeroes.

(*ii*) If graph lines are consistent then the pair of equations has ..... solutions.

(*iii*) If one root of equation $6x^2 + 2x + p = 0$ is reciprocal of other then the value of p is .....?

(*iv*) Formula of sum of first 'n' terms of an A.P. is .....

(*v*) Tangent of a circle touches the circle at ..... points.

(*vi*) $\frac{\sin 60°}{\cos 30°}$ = ...

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

PART–B

Note : Each question carries 2 marks.

4. Find the prime factors of 7429.
5. Find the zeroes of the polynomial $6x^2 - 3 - 7x$ and then verify the relation between the zeroes and the coefficents.
6. A horse is tied to a peg at one corner of a square shaped grass field of side 15m by means of a 5m long rope. Find the area of that part of field in which the horse cannot graze.
7. One dice is thrown once. Find the probability of the following :

   (i) A prime Number *(ii)* A number betwen 2 and 6.

PART–C

Note : Each question carries 4 marks.

8. Find the roots of the equation $\frac{1}{x} - \frac{1}{x-2} = 3$ here $x \neq 0, 2$. **Or**

   A motor boat whose speed is 18 km/hr in still water takes 1 hour more to go 24 km upstream than to return down stream to the same point. Find the speed of the stream.
9. How many terms ofA.P. 9, 17, 25..... should be taken to get the sum 636? **Or**

   Find the 11th term from the last term (towards the first term) of the A.P. : 10, 7, 4, ... –62.
10. If A and B are respectively (–2, –2) and (2, –4) then find the co-ordinates of P, such that AP = $\frac{3}{7}$ AB and P lies on line segment AB.
11. Prove that $= \sqrt{\frac{1+\sin\theta}{1-\sin\theta}}$ $\sec\theta + \tan\theta$.
12. As observed from the top of a 75m high light house from the sea-level the angle of depression of two ships are 30° and 45°. If one ship is exactly behind the other on the same side of the light house, find the distance between the two ships. **Or**

    The angle of elevation of the top of a tower from two points at a distance of 'a' meter and 'b' meters from the base of the tower and in the same straight line with it are complementary. Prove that the height of tower is $\sqrt{ab}$.
13. A metallic sphere of radius 4.2cm is melted and recasted into the shape of a cylinder of radius 6cm. Find the height of the cylinder. **Or**

    A toy is in the form of a cone of 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 toy.

PART–D

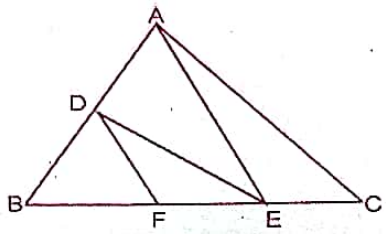
Note : Each question carries 6 marks.

14. Solve the pair of linear equations $3x - 5y - 4 = 0$ and $9x - 2y = 7$ by cross multiplication method.

Or

The sum of the digits of a two digit number is 9. Also nine times this number is twice the number obtained by reversing the order of the digits. Find the number.

15. In the given figure DE|||AC and DF||AE. Prove that $\frac{BF}{FE} = \frac{BE}{EC}$ sides.



Or

Prove that the lengths of tangents drawn from an external point to a circle are equal.

16. In a retail market, fruit vendors were selling mangoes kept in packing boxes. These boxes contained varying number of mangoes. The following was the distribution of mangoes according to the number of boxes.

No. of mangoes	50-52	53-55	56-58	59-61	62-64
No. of boxes	15	110	135	115	25

Find the mean number of mangoes kept in a packing box by using assumed mean (short-cut) method.

Or

If 28.5 is the median of the following data then find the value of X and Y.

Class Interval	Frequency
0-10	5
10-20	x
20-30	20
30-40	15
40-50	y
50-60	5
Total	60

Answers of Multiple Choice Questions

1. (*i*) (*c*), (*ii*) (*b*), (*iii*) (*a*), (*iv*) (*d*), (*v*) (*a*), (*vi*) ( ), (*vii*) (*a*), (*viii*) (*b*), (*ix*) (*c*), (*x*) (*c*), (*xi*) (*a*), (*xii*) (*b*), (*xiii*) (*c*), (*xiv*) ( ), (*xv*) (*b*), (*xvi*) (*a*) **2.** (*i*) False, (*ii*) False, (*iii*) True, (*iv*) True, (*v*) False, (*vi*) True, (*vii*) True, **3.** (*i*) Product, (*ii*) Infinite, (*iii*) 6, (*iv*) $\frac{n}{2}[a+l]$, (*v*) 3, (*vi*) 1, (*vii*) Mode.