Code No. **Series AG-B** **CLASS X** **TMG-D/79/89**

- Please check that this question paper contains 3 printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 30 questions.

General Instructions: -

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into three sections A, B ,C and D . Section A contains 10 questions of 1 marks each, Section B is of 5 questions of 2 marks each, Section C is of 10 questions of 3 marks each and Section D is of 5questions of 6 marks each.
3. Write the serial number of the question before attempting it.
4. If you wish to answer any question already answered, cancel the previous answer.
5. In questions where internal choices is provided. You must attempt only one choice.

MATHEMATICS

Time Allowed : 3 hours **Maximum Marks : 80**

SECTION A

1. Solve for x & y :217X +131 Y = 913 ;131X + 217Y = 827.
2. The sum and product of the zeros of a quadratic polynomial are $-\frac{1}{2}$ and -3 respectively. What is the quadratic polynomial ? Ans . Ref: Rohit sample paper / 2 /ex.2 }
3. For what value of k the quadratic equation $x^2 - kx + 4 = 0$ has equal roots ?Ans $k = \pm 4$. Ref: Rohitsample paper / 2 /ex. 3 }
4. Find the value of $\mathrm{cosec}(65^0 + \theta) - \sec(25^0 - \theta) - \tan(55^0 - \theta) + \cot(35^0 + \theta)$.
5. If the sum of first n terms of an A.P. is $2n^2 + 5n$, find its 4th term.
6. Find the area of a quadrant of a circle of radius 14cm.
7. In a ΔABC, if AD is the bisector of $\angle BAC$, prove that $\frac{Area(\Delta ABD)}{Area(\Delta ACD)} = \frac{AB}{AC}$.
8. If $\Delta ABC \sim \Delta DEF, \angle A = 36^0 \, and \angle F = 40^0. Find \angle C.$
9. A bag contains 7 white and 4 green balls. A ball is drawn from a bag. Find the probability that it is either white or green.
10. Check whether the first polynomial is a factor of the second polynomial by applying the division algorithm : $g(x) = 2x^2 - x + 3, f(x) = 6x^5 - x^4 + 4x^3 - 5x^2 - x - 15$.

SECTION B

11. Solve the equation graphically x – y + 1 = 0 and 3x + 2y – 12 = 0. determine the coordinates of the vertices of the triangle formed by these lines and the x – axis, and shade the triangular region.

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12. If $\sin\alpha = \frac{1}{2}$ & $\tan\beta = \frac{1}{\sqrt{3}}$ find the value of cos $(\alpha+\beta)$, where $\alpha \& \beta$ are both acute angles .

13. If the points (2,1) and (1,-2) are equidistant from the point (x,y) show that x + 3y = 0

14. P and Q are respectively the points on the sides AB and AC of a ΔABC. If AP = 2 cm, PB = 6 cm, AQ = 3 cm and QC = 9 cm, prove that BC = 4PQ.

15. A bag contains 5 red, 8 green and 7 white balls. One ball is drawn at random from the bag. Find the probability of getting (i) a white ball or a green ball.(ii) neither a green ball nor a red ball.

OR

A bag contains 5 red balls and some white balls. If the probability of drawing a white ball is double that of red ball, find the number of white balls in the bag.

SECTION C

16. Prove that there is no natural number for which 4^n ends with the digit 0.

OR

Show that any positive odd integer is of the form 4q + 1 or 4q + 3, where q is some integer.Ans 4 Ref: Rohit sample paper / 6 /ex. 16 }

17. If $\alpha \& \beta$ are the zeros of the polynomial $f(x) = x^2 - 5x + k$ such that $\alpha - \beta = 1$, find the value of k .

18. In a single throw of two dice, find the probability of getting

(a) a total of 9 or 11 (b) the same number on both dice (c) a multiple of 3 on one die and a multiple of 2 on the other die .Ans a = ¼ b = 1/6 c = 1/6 d = 11/36 e = ½ f = 5/12 . Ref: self tutor /16.6 /ex 9(ii) .}

19. Determine the common difference of the AP whose sum of m terms is $xm^2 + ym.$

20. Prove that : $\frac{1+\cos A}{\sin A} + \frac{\sin A}{1+\cos A} = 2\operatorname{cosec} A.$

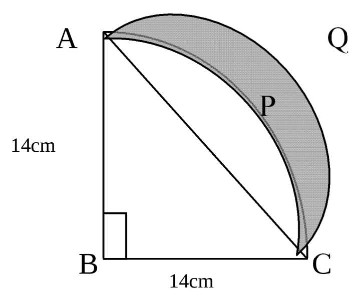
OR

Prove that $(1+\cot\theta - c\cos ec\theta)(1+\tan\theta+\sec\theta) = 2$

21. For what value of x will the points (x , - 1) , (2 , 1) and (4 , 5) are collinear

22. Find the coordinates of the points which divide the line segment joining the points (-4,0) and (0, 6) in four equal parts.

23. In the figure, ABCP is a quadrant of a circle of radius 14cm. With AC as diameter, a semi- circle is drawn . Find the area of the shaded region.



OR

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An iron solid sphere of radius 3 cm is melted and recast into small spherical balls of radius 1cm each. Assuming that there is no wastage in the process, find the number of small spherical balls made from the given sphere.

24. Draw a circle of 3 cm radius. Take a point P which is 5 cm away from the centre of the circle. Draw two tangents to the circle from the point P.

25. The encircle of ΔABC touches the side AB , BC& CA at P,Q &R respectively. Show that $AP + BQ + CR = \frac{1}{2}$ (perimeter of ΔABC) .

SECTION D

26. A motor boat whose speed is 18km/hr in still water takes 1 hour more to go 24km upstream than to return downstream to the same spot. Find the speed of the stream.

OR

A plane left 30 minutes late than its schedule time and in order to reach the destination 1500 km away in time, it had to increase the speed by 250km/h from the usual speed.Find its usual speed.

27. From the top of a building 100m high, the angles of depression of the top and bottom of a tower are observed to be 45^0 and 60^0 respectively. Find the height of the tower. Also find the distance between the foot of the building and bottom of the tower.

OR

A boy is standing on the ground and flying a kite with 120 m of string at an elevation of 30°. Another boy is standing on the roof of a 14 m high building and is flying his kite at an elevation of 45°. Both the boys are on opposite sides of both the kites. Find the length of the string that the second boy must have so that the two kites meet.

28. Prove that sum of the squares of the diagonals of a parallelogram is equal to sum of the squares of its sides.

29. Water is flowing at the rate of 7 meters per second through a circular pipe whose internal diameter is 2 cm into a cylindrical tank, the radius of whose base is 40 cm. Determine the increase in the water level in ½ hour.

30. Draw both type of ogive i.e. ‘ less than ogive’ and ‘ More than ogive’ and hence obtain the median and also verify by using formula . .

Class	10 - 20	20 -30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80	80 - 90	90 - 100
Frequency	5	14	19	27	43	29	16	12	5

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