

MID TERM EXAMINATION (2017-18)

CLASS X
MATHEMATICS

Time: 3 hours

Max. Marks : 80

General Instructions:-

1. All questions are compulsory.
 2. The question paper consists of 30 questions divided into four sections **A, B, C** and **D**
 3. Section **A** contains **6** questions of **1** mark each. Section **B** contains **6** questions of **2** marks each. Section **C** contains **10** questions of **3** marks each. Section **D** contains **8** questions of **4** marks each.
 4. Use of **calculators** is not permitted.
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SECTION A

1 mark questions

- Q1. A letter is chosen at random from the letter of the word - ~~PROBABILITY~~. Find the probability that it is a not a vowel. aeiou
- Q2. For what value of k , (-4) is a zero of the polynomial $x^2 - x - (2k + 2)$?
- Q3. Write a quadratic polynomial, the sum and product of whose zeroes are 3 and -2 respectively.
- Q4. Find the value of 'a' so that the point $(3, -9)$ lies on the line represented by $2ax - 3y = 15$.
- Q5. What is the mean of 1st four prime numbers?
- Q6. State converse of Basic Proportionality Theorem.

SECTION B

2 mark questions

- Q7. If 1 is zero of the polynomial $p(x) = ax^2 - 3(a-1)x - 1$, then find the value of a .
- Q8. Draw a line segment of length 7.6 cm and divide it in ratio of $5 : 3$ geometrically.
- Q9. Show that the square of odd positive integers is of the form $8m + 1$ for some whole number m .
- Q10. If $\sec \theta + \tan \theta = p$, then find the value of $\sec \theta - \tan \theta$.
- Q11. Find the zeroes of the polynomial $x^2 - x - 6$.
- Q12. The lengths of the diagonals of a rhombus are 16 cm and 12 cm. Then; find the length of the side of the rhombus.

SECTION C

3 mark questions

Q13. Cards marked with numbers 1,3,5...49 are placed in a box and mixed thoroughly. One card is drawn from the box. Find the probability that the number on the card is

- (i) Divisible by 3
- (ii) Not a perfect square
- (iii) Multiple of 3 and 5

Q14. On dividing $3x^3+4x^2+5x-13$ by a polynomial $g(x)$, the quotient and remainder is $(3x + 1)$ and $(16x-43)$ respectively, find the polynomial $g(x)$.

Q15. If one zero of polynomial $4x^2 - 2x - 4 + k$ is reciprocal of the other, find the value of 'k'.

Q16. Find all the zeros of the polynomial $x^4+x^3-34x^2-4x+120$, if two of its zeroes are 2 and -2.

Q17. For what value of k the following pair has infinite number of solutions.

$$(k-3)x + 3y = k$$

$$K(x + y) = 12$$

Q18. Solve the equations by using the method of cross multiplication:

$$X + Y = 7$$

$$5X + 12Y = 7$$

Q19. In a sports meet, the number of players in Football, Hockey and Athletics are 48, 60, respectively. Find the minimum number of rooms required, if in each room the same number of players are to be seated and all of them being in the same sports?

Q20. Determine whether triangle having sides $(a-1)$ cm, $2\sqrt{a}$ cm and $(a + 1)$ cm is a right angled triangle.

Q21. If $\cos x = \cos 60^\circ \cos 30^\circ + \sin 60^\circ \sin 30^\circ$ then find the value of x.

Q22. Sides AB, AC and median AD of a triangle ABC are respectively proportional to sides PQ, PR and median PM of another triangle PQR. Show that $\triangle ABC \sim \triangle PQR$.

SECTION D

4 mark questions

Q23. From the top of a lighthouse 75 m high, the angles of depression of two ships observed to be 30° and 45° respectively. If one ship is directly behind the other on the same side of the lighthouse then find the distance between the two ships.

Q24. Draw a ΔABC with sides $BC = 5\text{cm}$, $AB = 6\text{cm}$ and $AC = 7\text{cm}$ and then construct a triangle similar to ΔABC whose sides are $\frac{4}{7}$ of the corresponding sides of ΔABC .

Q25. Solve the equation:

$$px + qy = p - q$$

$$qx - py = p + q$$

Q26. Draw graph of $x + 2y - 7 = 0$ and $2x - y - 4 = 0$. Shade and find the area bounded by these lines and Y - axis.

Q27. Prove that the ratio of the areas of two similar triangles is equal to the ratio of square of their corresponding sides.

Q28. Prove that $\sqrt{\frac{\operatorname{cosec} A - 1}{\operatorname{cosec} A + 1}} + \sqrt{\frac{\operatorname{cosec} A + 1}{\operatorname{cosec} A - 1}} = 2 \sec A$

Q29. Consider the following distribution:-

Class interval	0-20	20-40	40-60	60-80	80-100
frequency	17	28	32	P	19

If the mean of the above data is 50, then find the value of p?

Q30. The following distribution gives the daily income of 65 workers of a factory:-

Daily income (in Rs)	100-120	120-140	140-160	160-180	180-200
No. of worker	14	16	10	16	9

Convert the distribution above to a more than type cumulative frequency distribution and draw an Ogive.