Class 11 Maths

Instructions

Section A contains 10 questions of 1 mark each
Section B contains 12 questions of 4 marks each.
Section C contains 7 questions of 6 marks each.

Section A

1. The A.M. of 4 and another number is 10. Find the other number.
2. Write the first three terms of the sequence $a_n = (-1)^{n-1} 5^{n+1}$.
3. Find 20th term of G.P., $\frac{5}{2}$, $\frac{5}{4}$, $\frac{5}{8}$, ….
4. Find the modulus of $\frac{i+1}{1-i}$
5. Find the equation of circle passing through (-7, 1) having center at (-4, -3).
6. Find the eccentricity of the ellipse $9x^2 + 4y^2 = 36$.
7. Find the value of $\frac{8!}{6! \times 2!}$
8. If $\frac{1}{6!} + \frac{1}{7!} = \frac{x}{8!}$, calculate the value of x.
9. A function f is defined by f(x)=2x-5, find f(7).
10. Write the range of the function f= {(1,3),(2,5),(3,5)}.

Section B

11. Find the equation of the parabola which is symmetrical about the x-axis whose vertex is at origin and passes through the point (2, -3).
12. Find the equation of the ellipse, with major axis along the x-axis and passing through the points (4, 3) and (-1, 4).
13. Define a relation R on the set of natural numbers by R={(x, y): y=x+5, x is a natural number<4, x,y ∈N} write R as roster form, write domain and range of R
14. A function f is defined by f(x)=2x-5,Write down the values of (i) f(0) (ii) f(-7) (iii) f(3)
15. If in two circles, arcs of the same length subtend angles 60° and 75° at the centre, find the ratios of radii.
16. Find the values of sinx, cosx, secx if tan x = -5/12, x lies in the second quadrant.
17. Show that tan3x tan2x tanx = tan3x – tanx – tan 2x.
18. Show that cos 6x = 32 cos6x – 48 cos4x + 18 cos2x – 1
19. How many words with or without meaning can be made from the letters of the word MONDAY, assuming that no letter is repeated if
    i. 4 letters are used at a time
    ii. All letters used at a time and,
    iii. All the letters are used but first letter is a vowel.
20. In how many ways can the letters of the word PERMUTATIONS be arranged if there are always 4 letters between P and S.
21. Prove that ${}^nC_r + {}^nC_{r-1} = {}^{n+1}C_r$
22. Insert 3 A.M.S between 8 and 24.

Section C

23. If $(x+iy)^3 = u+iv$ then show that $=4(x^2-y^2)$
24. If a, b, c are three consecutive terms of an A.P and x, y, z are three consecutive terms of G.P.

then prove that $x^{b-c}.y^{c-a}.z^{a-b}=1$.

25. Find the number of the words with or without meaning which can be made using all the letters of the word AGAIN. If, these words are written as in a dictionary, what will be the 50^{th} word.

26. Solve $2\cos^2 x + 3\sin x = 0$

27. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I,9 read both H and I, 11 read H and T , 8 read both T and I, 3 read all three newspapers. Find the number of people who read at least one of the newspapers.

28. A rod AB of length 15 cm rests in between two coordinate axes in such a way that the end point A lies on the x-axis and end B lies on the y-axis. A point P(x, y) is taken on the rod in such a way that AP = 6 cm. Find the locus of P.

29. An equilateral triangle is inscribed in the parabola $y^2 = 4ax$, where one vertex is at the vertex of the parabola. Find the length of the side of the triangle.