CLASS : 10 THIRD REVISION EXAMINATION, MARCH-2023

MATHEMATICS

Time Allowed : 3.00 Hours] [Max. Marks : 100

Register Number

PART – A

14x1=14

I. Answer the following questions.

1. A = {a, b, p}, B = {2, 3}, C = {p, q, r, s} then, n{(A∪C)xB} is
   (a) 8 (b) 20 c) 12 d) 16
2. If f(x) = x² + 5 then, f(-4) = ----------
   (a) 26 (b) 21 (c) 20 (d) -20
3. The sum of the exponents of the prime factors in the prime factorization of 1729 is
   (a) 1 (b) 2 (c) 3 (d) 4
4. In an A.P the first term is 1 and the common difference is 4. How many terms of the A.P must be taken for their sum to be equal to 120?
   (a) 6 (b) 7 (c) 8 (d) 9
5. Which of the following should be added to make $x^4 + 64$ a perfect square
   (a) $4x^2$ (b) $16x^2$ (c) $8x^2$ (d) $-8x^2$
6. If A is a 2x3 matrix and B is a 3x4 matrix, how many columns does have AB have ----------
   (a) 3 (b) 4 (c) 2 (d) 5
7. A tangent is perpendicular to the radius at the ---------
   (a) centre (b) point of contact (c) infinity (d) Chord
8. If ΔABC is an isosceles triangle with ∠C=90° and AC = 5cm, then AB is
   (a) 2.5 cm (b) 5 cm (c) 10 cm (d) $5\sqrt{2}$ cm
9. The straight line given by the equation x=11 is
   (a) parallel to x axis (b) parallel to y axis
   (c) passing through the origin (d) passing through (0, 11)
10. (2, 1) is the point of intersection of two lines
    (a) x-y-3=0; 3x-y-7=0 (b) x+y=3; 3x+y=7 (c) 3x+y=3; x+y=7 (d) x+3y-3=0; x-y-7=0
11. (1+tanθ + secθ) (1+cotθ - cosecθ) is equal to --------
    (a) 0 (b) 1 (c) 2 (d) -1
12. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be
    (a) 12 cm (b) 10 cm (c) 13 cm (d) 5 cm
13. The ratio of the volumes of a cylinder a cone and a sphere, if each has the some diameter and some height is
    (a) 1:2:3 (b) 2:1:3 (c) 1:3:2 (d) 3:1:2
14. The standard deviation of a data is 3. If each value is multiplied by 5, then the new variance is
    (a) 3 (b) 15 (c) 5 (d) 225

PART - B

II. Answer any 10 questions. [Question No. 28 is compulsory]. 10x2=20

15. Let f be a function from R→R defined by f(x)=3x-5. Find the values of a and b given that (a, 4) and (1, b) belong to f.
16. Prove that two consecutive positive integers are always coprime.
17. Construct 3x3 matrix whose elements are $a_{ij} = i^2j^2$.
18. Show that the angle bisector of a triangle are concurrent.
19. If the points P(-1, -4), Q(b, c) and R(5, -1) are collinear and if 2b+c=4, then find value of b and c.
20. Show that the straight lines x-2y+3=0 and 6x+3y+8=0 are perpendicular.
21. Prove that $\tan^2\theta - \sin^2\theta = \tan^2\theta \sin^2\theta$
22. Find the top of a tree of height 13 m the angle of elevation and depression of the top and bottom of another tree are 45° and 30° respectively. Find the height of the second tree. ($\sqrt{3}$=1.732)

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23. The radius of a spherical balloon increases from 12 cm to 16 cm air being pumped into it. Find the ratio of the surface area of the balloons in the two cases.
24. The ratio of the volumes of 2 cones is 2:3. Find the ratio of their radii if the height of the second cone is double the height of the first.
25. The mean of the data is 25.6 and the coefficient of variation is 18.75. Find the standard deviation.
26. In a two children family, find the probability that there is atleast one girl in a family.
27. Define Sample space.
28. If α,β are the roots of the equation $3x^2 + 7x - 2=0$. Find the value of $\frac{\alpha}{\beta} + \frac{\beta.}{\alpha}$

PART - C

III. Answer any 10 questions only [Q.NO: 42 is compulsory] **10x5=50**

29. If A = {x∈W/x<2}, B={x∈N/1<x≤4} and c={3, 5}. Verify that (A∪B)xC=(AxC)∪(BxC).
30. If f = {(-1,3), (0,-1), (2,-9)} be a linear function from Z into z. Find f(x).
31. If f(x) = x-4, g(x) = x^2 and h(x) = 3x-5, then show that (fog)oh = fo(goh).
32. Find the remainder when 2^{81} is divisible by 17.
33. Find the HCF of 396, 504, 636.
34. The sum of the cubes of the first n natural numbers is 2025, then find the value of n.
35. There are 12 pieces of five, ten and twenty rupee currencies whose total value is ₹ 105. When first two sorts are interchanged in their numbers its value will be increased by ₹ 20. Find the number of currencies in each sort.
36. The hypotenuse of a right angled triangle is 25 cm and its perimeter 56 cm. Find the smallest side.
37. State and prove pythagoras theorem.
38. Show that the angle bisectors of a triangle are concurrent.
39. Find the equation of a line joining through the point A (1,4) and perpendicular to the line joining the points (2,5) and (4,7).
40. If $\frac{\cos\theta}{1+\sin\theta} = \frac{1}{a}$ then, prove that $\frac{a^2-1}{a^2+1} = \sin\theta$
41. The volume of a cone is $1005\frac{5}{7}$ cu.cm. The area of its base is $201\frac{1}{7}$ sq.cm. Find the slant height of the cone.
42. The marks scored by 10 students in a class test are 25, 29, 30, 33, 35, 37, 38, 40, 44, 48. Find the standard deviation.

PART - D

IV. Answer the following questions. **2x8=16**

43. a) Draw a circle of diameter 6 cm from a point P, which is 8 cm away from its centre. Draw the tangents PA and PB to the circle and measure their lengths.

(OR)

b) Draw a triangle ABC of base BC = 8cm, ∠A = 60° and the bisector of ∠A meets BC at D such that BD=6 cm.

44. a) Draw the graph of $y= 2x^2-3x-5$ and hence solve $2x^2-4x-6=0$.

(OR)

b) Graph the following linear function $y=1/_2{}^x$. Identify the constant of variation and verify it with the graph. Also (i) Find y when x=9, (ii) find x when y = 7.5