FIRST YEAR HSE SAMPLE QUESTION PAPER 2023

MATHEMATICS(COMMERCE)

Score 60   **Time 2hr**

Answer any 6 questions from 1 to 7. Each carries 3 scores   **(6x3=18)**

1. Let A=$\{1, 2, 3, 4\}$, B=$\{3, 4, 5, 6\}$.Find (i) AUB   (ii) A∩B   (iii) A-B   (3)

2. (i) If $(x+1,y-2)=(3,1)$.Find the value of x and y   (2)

   (ii) If $f(x) = x^2+2x-3$.Find f(1).   (1)

3. (i) Find the value of i^{32} (1)

   (ii) Find the multiplicative inverse of 4-3i   (2)

4. (i) Solve $3(1-x) \le 2(x+4)$ (2)

   (ii) Represent the solution on a nummber line   (1)

5. (i) $nc_2 = nc_8$, find n?   (1)

   (ii) Find the number of arrangements using the letter of the word MONDAY

with or without meaning?   (2)

6. Find the centre and radius of the circle $x^2 + y^2 +8x+10y-8=0$ (3)

7.Find, the derivatives of sinx using first principle   (3)

8. Three coins are tossed , find the probability of getting atleast one head.   (3)

Answer any 6 questions from 8 to 15.Each carries 4 scores   **(6x4=24)**

9. (i) Draw the graph of $f(x)=|x|-1$ (2)

   (ii) Find the domain and range of f(x).   (2)

10. (i) $\sin(\pi-x)=$ -------   (1)

   (ii) Prove that $\frac{\cos\cos 7x+\cos\cos 5x}{\sin7x-\sin5x}$ = cot x   (3)

11. Four cards are drawn from a pack of 52 playing cards.In how many of these

    (i) four cards are of the same suit   (1)

    (ii) are face cards   (1)

    (iii) two are red cards and two are black cards   (1)

    (iv) cards are of the same color   (1)

12. (i) Number of terms in the expansion o $(1+x)^{2n}$ is -------   (1)

    (ii) Expand $(1+x)^5$.   (4)

13. Find the coordinate of the foci,vertices,length of major axis, length of

    minor axis ,the eccentricity and the latus rectum of the ellipse $\frac{x2}{25} + \frac{y2}{9} = 1$ (4)

14. (i) Name the octant in which the point (-2,3,1) lies.   (1)

    (ii) Prove that the point (0,7,10),(-1,6,6) and (-4,9,6) are the vertices of a right angled

      triangle.   (3)

15. Find (i) $\frac{sin4x}{sin2x}$ (2)

      (ii) Find the derivative of x sinx   (2)

16.Find the mean deviation about median for the data:

    xi : 15   21   27   30   35

    fi : 3   5   6   7   8   (4)

Answer any 3 questions from 16 to 19.Each carries 6 scores.   **(3x6=18)**

17. (i) Find the sum of the sequence 5,55,555,----------   (3)

  (ii) Insert two numbers between 3 and 81 so that the resulting sequence is GP. (3)

18.(i) Find the slop of the line joining the points (1,2) and (-3,4).   (1)

    (ii) Find the distance of the point (3,-1) from the line 3x-4y-26=0   (2)

    (iii)Find the equation of a line perpendicular to the line x-2y+3=0 and pa

      through the point (1,-2)   (3)

19.(i) If A and B are events such that P(A)=0.42, P(B)=0.48 and P(A and B)=0.16.

Determine (i) P(A or B)   (ii) P(not A)

(iii)P(not B)   (iv)P(not A and not B)   (4)

(ii)In class XI of a school 40% of the students study Mathematics 30% study Biology 10% of the class study both Mathematics and Biology.If a student is selected at random from the class find the probability that he will be studying Mathematics or Biology   (2)

20. Find mean, varience and standard deviation for the following frequency distribution.

Classes :	0-10	10-20	20-30	30-40	40-50	
Frequency:	5	8	15	16	6	(6)

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