FIRST YEAR HIGHER SECONDARY SAMPLE QUESTION PAPER 2023

PART III

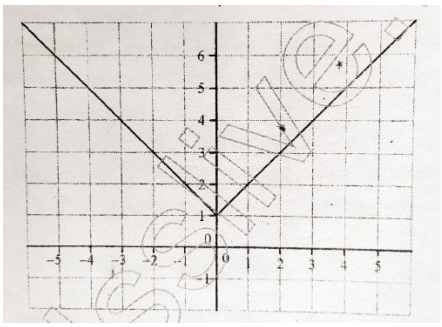
MATHEMATICS(COMMERCE) **Time : 2 Hours**

Maximum : 60Scores **Cool off Time : 15 Minutes**

Answer any six questions from 1 to 8 .Each carries 3 marks .

1. If U = {1,2,3,4,5,6,7,8,9}; A = {2,4,6,8} B = {2,3,5,7}, Verify (A U B)' = A' ∩ B' (3)

2. Graph of the function $f: R \to R$ is given below:



a) Write the value of $f(2)$ (1)

b) Write the range of $f(x)$ (1)

c) Identify the function and choose the correct answer. (1)

i) $f(x) = |x + 1|$ ii) $f(x) = |x - 1|$ iii) $f(x) = |x| + 1$ iv) $f(x) = |x| - 1$

3. Express the complex number $\frac{2-i}{(1+2i)}$ in the form a+ib. (3)

4. (a) Represent the inequality x > -3 on a number line. (1)

(b) Solve the inequality $3(2 - x) \geq 2(1 - x)$ (2)

5. (a) If ${}^{n}C_9 = {}^{n}C_8$, then n = ---------- (1)

(b) If $\frac{1}{6!} + \frac{1}{7!} = \frac{x}{8!}$, then x is _____ (2)

6. Let S and S' foci of the ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$ Let P be a point on the ellipse, then

(i) PS + PS' = _____ (1)

(ii) Find the coordinates of S and S' (2)

7. Find the derivative of $sinx$ from the first principle. (3)

8. Two dice are thrown at random . Find the probability of

(i) getting a doublet (1)

(ii) getting sum of the numbers on the dice 8 (2)

Answer any six questions from 9 to 16 .Each carries 4 marks .

9. (a) A ={2,3} B={1,3,5} then the number of relations from A to B is _____ (1)

(b) R is a relation defined on the set A = {1,2,3,4, ……., 14}. R = {(x,y)/ 3x – y = 0, x,yϵA}

Write the domain, co-domain and range (3)

10. (a) Prove that $\frac{sin5x-2sin3x+sinx}{cos5x-cosx} = tanx$ (3)

(b) $\frac{2\pi}{3}$radian = _____degree (1)

i) 60 ii) 150 iii) 120 iv) 180

11. (a) Find the value of n if 12. $^{(n-1)}P_3 = 5.\ ^{(n+1)}P_3$ (2)

(b) Find the number of arrangements of the letters of the word INDEPENDENCE. (2)

12. Find the co-ordinates of the foci, the vertices, the length of transverse axis,

conjugate axis, the eccentricity and the latus rectum of the hyperbola $\frac{x^2}{16} - \frac{y^2}{9} = 1$ (4)

13. (a) $\lim_{x\to a} \frac{x^n-a^n}{x-a}$ = …… (1)

(b) Find the derivative of $\frac{x+cosx}{tanx}$ (3)

14. Consider the following data : 6,8,10,12,14,16,18,20,22,24 .Find its mean deviation about mean. (4)

15. (a) $^nC_0 - {}^nC_1 + {}^nC_2 - {}^nC_3 + \ldots + (-1)^n\ {}^nC_n$ = ……. (1)

i) 2^n ii) 0 iii) 2^{n-1} iv) 2

(b) Expand $(x + \frac{1}{x})^5$ (3)

16. (a) The coordinates of points in the XY plane are of the form _____ (1)

(b) Consider the triangle with vertices A(0,7,-10); B(1,6,-6) and C(4,9,-6) .Prove that

the triangle is right angled (3)

Answer any 3 questions from 17 to 20 .Each carries 6 marks .

17. (a) The 6th term of the GP $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$……. Is _____ (2)

(b) The sum of first three terms of a G.P is $\frac{13}{12}$ and their product is –1 .

Find the common ratio and the terms. (4)

18. (a) Find the equation of the line joining (-2,6) and (4,8) . (2)

(b) If the angle between two lines is $\frac{\pi}{4}$ and slope of one of the lines is $\frac{1}{2}$, find the slope of the other line. (4)

19. (a) If A and B are mutually exclusive and exhaustive events then P(A) + P(B) = _____ (1)

(b) In a class of 60 students, 30 opted for NCC, 32 opted for NSS and 24 opted for both NCC and NSS . If one of these students is selected at random, find the probability that :

(a) the student selected for NCC or NSS. (2)

(b) the student opted for exactly one of NCC or NSS. (2)

(c) the student has selected neither NCC nor NSS (1)

20. Calculate mean, varianece and standard deviation for the following distribution. (6)

Score	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
Frequency	3	7	12	15	8	3	2

^^

Tirurangadi education district

Prepared by

1. **JIJEESH P**
2. **LAKSHMI GR**
3. **Dr. SREEJA SR**
4. **SAJITHA KK**
5. **SANDHYA KG**
6. **RAJALAKSHMI R**
7. **JAFER SHEREEF K**
8. **MOHAMMED SHAMSEER**
9. **REENA U**
10. **SHYJA**