D2BBH2201   (PAGES 2)   Reg. No............................

                                                                Name: ....

SECOND SEMESTER UG DEGREE EXAMINATION, APRIL 2023
(Regular/Improvement/Supplementary)
BBA HONOURS
GBAH2B05T : FINITE MATHEMATICS

Time: 3 Hours   **Maximum Marks: 80**

PART A: Answer *all* **the questions. Each carries** *one* **mark.**

Choose the correct answer.

1. The order of the matrix $\begin{bmatrix} 2 & 0 & 1 \\ -5 & 9 & 5 \end{bmatrix}$ is.....................
   A) 2×3 B) 3×3 C) 3×2 D) 2×2

2. $\lim_{x \to 3} x^2 + 1 =$ ....
   A) 4   B) 10   C) 7   D) 5

3. The probability of getting a head when a coin is tossed once is
   A) 1/2   B) 1   C) 0   D) 2

4. The slope of the line $3x - 2y = 7$ *is* ....
   A) 3/2   B) 2/3   C) -3/2   D) -2/3

5. Let E be the event of tossing three coins at a time. Then the number of elements of sample space of E is...............................
   A) 3   B) 8   C) 6   D) 9

Fill in the Blanks.

6. $\lim_{x \to 0} \frac{\sin 5x}{x} =$ ········

7. Simple interest on Rs.3000 at 7% rate of interest for one year is ....

8. .... is the limiting case of the Binomial distribution.

9. If m_1 *and* m_2 are the slopes of two parallel lines and $m_1 = \frac{1}{\sqrt{3}}$ then $m_2 =$............

10. The general form of the equation of a straight line is ....

$$(10 \times 1 = 10 \text{ Marks})$$

PART B: Answer any *eight* **questions. Each carries** *two* **marks.**

11. Find the rate of interest if the simple interest on the principal of Rs. 10000 is Rs. 1500 for 2 years.

12. Evaluate $\lim_{x \to 2} \frac{x^2 - 4}{x^3 - 4x^2 + 4x}$.

13. What is the probability of getting a number greater than 4 when we throw a die once?

14. State Baye's theorem on probability.

15. Find the derivative of $f(x) = cosec x$

16. What sum of money will amounts to Rs. 810 in 2.5 years at 5% simple interest ?

17. Find $\frac{dy}{dx}$ when $y = x^n$

18. What is meant by independent events in probability?

19. Write the equation of a line with slope ½ and y intercept -3/2.

20. Write the equation of a line passing through the points $(1, -1) and (3, 5)$

$$(8 \times 2 = 16 \text{ Marks})$$
(PTO)

PART C: Answer any *six* questions. Each carries *four* marks.

21. Find $A^2 - A + 2I$ where A is A $= \begin{bmatrix} 3 & 0 & 1 \\ -1 & 2 & 3 \\ 1 & 0 & -1 \end{bmatrix}$

22. Find the derivative of the function $f(x) = \log(\cos(x^2))$

23. Find the absolute extreme values of the function $g(t) = 8t - t^4$ on $[-2,1]$

24. Find the compound interest on Rs. 25000 for $1\frac{1}{2}$ years at 8% per annum, interest being reckoned halfyearly.

25. Bag I contains 3 red balls and 4 black balls while another bag II contains 5 red balls and 6 black balls. One ball is drawn at random from one of the bags and it is found to be Red. Find the probability that it was drawn from BagII.

26. Solve graphically the given linear programming problem
    Maximize $z = x + 3y$ subject to
    $$2x + y \leq 20$$
    $$x + 2y \leq 20 \quad \text{and } x \geq 0 \text{ and } y \geq 0$$

27. Find the inverse of the matrix using Gauss Jordan method $\begin{bmatrix} -2 & 5 & 2 \\ 1 & -3 & -1 \\ -1 & 2 & 1 \end{bmatrix}$

28. Check whether the following points

    $(4,8), (5,12)$ and $(9,28)$ are collinear.

(6 × 4 = 24 Marks)

PART D: Answer any *two* questions. Each carries *fifteen* marks.

29. Solve by using simplex method.
    Maximize $z = 5x_1 + 3x_2$ subject to
    $$x_1 + x_2 \leq 2$$
    $$5x_1 + 3x_2 \leq 10$$
    $$3x_1 + 8x_2 \leq 12 \quad \text{and } x_1 \geq 0 \text{ and } x_2 \geq 0$$

30. Solve the given system of linear equations by using inverse of matrices
    $$x + y + z = 3$$
    $$3x + 2y + 2z = 4$$
    $$x + y + 3z = 5$$

31. The Fahrenheit temperature F and absolute temperature K satisfies a linear equation. Given that K = 273 when F = 32 and that K = 373 when F = 212. Express K in terms of F and find the value of F when K = 0.

(2 × 15 = 30 Marks)