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D1BAM2403

Name: .....

Reg. No.: .....

FIRST SEMESTER FYUGP EXAMINATION NOVEMBER 2024

APPLIED MATHEMATICS

MULTI DISCIPLINARY COURSE

AMA1FM105(1): MATRICES AND BASICS OF PROBABILITY THEORY

Time : 1 ½ Hrs. **Maximum Marks: 50**

M – Mark BL - Bloom's Taxonomy Level (1 to 6) CO - Course Outcome

Section A: Answer all questions. Each carries 2 marks.
Ceiling: 16 Marks

No.	Question	M	BL	CO
1.	Let A= $\begin{vmatrix} 2 & 7 & -5 \\ -2 & 1 & 0 \\ 6 & 3 & 4 \end{vmatrix}$. Evaluate the minors of elements 2 and 3 in A.	2	2	CO1
2.	If $\begin{vmatrix} 2 & 3 \\ 9 & 6 \end{vmatrix} + \begin{vmatrix} -1 & -2 \\ 7 & 0 \end{vmatrix} = \begin{vmatrix} 1 & x \\ 16 & y \end{vmatrix}$ find x and y.	2	3	CO1
3.	Write the formula for finding x, y and z using matrix method in solving a system of equations in three variables *x, y* and *z*.	2	1	CO2
4.	Express the following sets of simultaneous equations in matrix form: a) x+y+z = 4 ; 2x-3y+4z = 33 ; 3x-2y-2z = 2 b) 2x+3y-4z = 26; x-5y-3z = -87; -7x+2y+6z = 12	2	1	CO2
5.	Solve the system of equations using Cramer's Rule. 3x+2y=7 2x+y=4	2	2	CO2
6.	Solve 2x+3y=6 2x-2y=1 by Gauss elimination method.	2	3	CO2
7.	Solve the system of equations -x+y=-5 2x-5y =1	2	5	CO2
8.	At a political debate, a sample of audience members were asked to name the political party to which they belonged. Their responses are shown in the table. What is the mode of responses?	2	2	CO3

Political Party	**Frequency f**
Democrat	46
Republican	34
Independent	39
Other	5

(PTO)

9.	Define Classical Probability.	2	1	CO3
10.	Evaluate 4! and 6!/5!	2	2	CO3

Section B: Answer all questions. Each carries 6 marks.
Ceiling: 24 Marks

No.	Question	M	BL	CO
11.	Evaluate the matrix product AB and BA $A=\begin{bmatrix}3 & 2 & 1\\ 9 & 1 & 3\end{bmatrix}$ $B=\begin{bmatrix}2 & 9\\ 1 & 3\\ 2 & 4\end{bmatrix}$	6	5	CO1
12.	Solve the simultaneous equations 2x+4y=2, -3x+y=11 using determinant method.	6	5	CO2
13.	In a study of high school football players that suffered concussions, researchers placed the players in two groups. Players that recovered from their concussions in 14 days or less were placed in Group 1. Those that took more than 14 days were placed in Group 2. The recovery times (in days) for group 1 are listed below. Find the range, sample variance and standard deviation of the recovery times. 4 7 6 7 9 5 8 10 9 8 7 10	6	3	CO3
14.	A card is selected from a standard deck of playing cards. Find the probability of each event. 1. Event D: Selecting the nine of clubs 2. Event E: Selecting a heart 3. Event F: Selecting a diamond, heart, club or spade	6	2	CO3
15.	Determine whether the events are mutually exclusive. Explain your reasoning 1. Event A: Roll a 3 on a dice. Event B: Roll a 4 on a dice. 2. Event A: Randomly select a male student. Event B : Randomly select a nursing major. 3. Event A : Randomly select a blood donor with type O blood. Event B: Randomly select a female blood donor.	6	2	CO3

Section C: Answer any one question. Each carries 10 marks. (1 x 10 = 10 Marks)

No.	Question	M	BL	CO
16.	Determine the adjoint matrix of $\begin{bmatrix}3 & 6 & 2\\ -2 & 5 & 7\\ -1 & 0 & 3\end{bmatrix}$	10	3	CO1

17.	Construct a frequency distribution for the data set using the indicated number of classes. In the table, include the midpoints, relative frequencies and cumulative frequencies. Which class has the greatest frequency and which has the least frequency? Data: Book Spending Number of classes :6 Data set: Amounts (in dollars) spent on books for a semester 91 472 279 249 530 188 341 266 199 142 273 189 130 489 266 248 101 375 486 190 398 188 269 43 30 127 354 84	10	5	CO3