Code: MCA24A103

St. Philomena's College (Autonomous), Mysore

I Semester – MCA – C2 Internal Assessment, April - 2025

Subject: COMPUTER NETWORKS

Time: 75 Minutes **Max. Marks: 30**

PART A

Answer the following **2 x 10 = 20**

1	a.	Explain how Stop and wait protocol is used to provide flow & error control in data transmission with suitable diagrams.	CO1	10
		OR		
2	a.	Explain the working principle of Client-server programming systems with suitable diagrams	CO1	10
3	a.	Discuss various types of Security attacks with suitable examples.	CO2	10
		OR		
4	a.	Explain Playfair cipher & Hill cipher encryption methods with examples.	CO2	10

PART B

Answer the following **2 x 5 = 10**

5		Write a note on Go-back-N protocol used in the transmission of data packets.	CO1	5
		OR		
6		Write a note on FTP.	CO1	5

PTO

7	Explain the operation of Caesar cipher. Derive the cipher text using the same for the plain text message "CRYPTOGRAPHY" with the key length K=5.	CO2	5

OR

8	ExplainDouble Transposition encryption method.Encrypt "attack postponed until two am" using the same for the key 4312567.	CO2	5

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Code: MCA24A202

ST. PHILOMENA'S COLLEGE (AUTONOMOUS), MYSORE

I Semester – MCA - C2 Internal Assessment, April - 2025

Subject: BUSINESS SYSTEMS

Time: 75 Minutes

Max. Marks: 30

PART A

Answer any two full questions — 2 x 10 = 20

1	a.	Define and explain the concept of Organizational Planning.	CO3	6
	b	Explain SWOT analysis in detail.	CO3	4
		OR		
2	a.	Discuss the case study of Bristow Helicopters, focusing on how technology is supported by SWOT analysis.	CO3	6
	b.	Illustrate the essential components of e-business models.	CO3	4
3	a.	Explain Cross-Functional Enterprise Applications in detail.	CO4	6
	b	Explain Enterprise Integration in detail.	CO4	4
		OR		
4	a.	Provide a detailed explanation of Transaction Processing Systems(TPS)	CO4	6
	b.	Discuss the integration challenges faced by Coty, Unilever, and iWay.	CO4	4

PART B

Answer the following — 2 x 5 = 10

5		Explain Business/IT Architecture Planning in detail.	CO3	5

PTO

OR

6	Describe the concept of Balanced Scorecard.	CO3	5
7	Explain Enterprise Collaboration System in detail.	CO4	5

OR

8	Discuss the role of Enterprise Architects in the case studies of Toyota Europe, Campbell Soup Company, Sony Pictures, and W.W. Grainger.	CO4	5

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Code: MCA24A202

ST. PHILOMENA'S COLLEGE (AUTONOMOUS), MYSORE

I / III Semester – MCA - C1 Internal Assessment, March - 2025

Subject: Business Systems

Time: 75 Minutes **Max. Marks: 30**

PART A

Answer the following **2 x 10 = 20**

1	a.	Explain the fundamental roles of Information Systems in business.	CO1	6
	b	Define an Information System and explain it with a suitable example.	CO1	4
		OR		
2	a.	Describe the key trends in Information Systems.	CO1	6
	b.	How have Information Technologies contributed to the business success of eCourier and Bryan Cave?	CO1	4
3	a.	Discuss the major challenges faced in IT careers.	CO2	6
	b	Explain the process involved in developing IS solutions.	CO2	4
		OR		
4	a.	Describe Information System Resources in detail.	CO2	6
	b.	What are the components of Information Systems? Explain with a suitable figure.	CO2	4

PART B

Answer the following **2 x 5 = 10**

5		Explain Conceptual Framework of Information Systems.	CO1	5
		OR		

6	Explain the classification of information systems with a suitable diagram. Also, provide an example of an Operations Support System (OSS)	CO1	5
7	Describe the concept of System in detail.	CO2	5
	OR		
8	Explain the Information Systems Activities.	CO2	5

			Code: MCA24A201	
ST. PHILOMENA'S COLLEGE (AUTONOMOUS), MYSORE				
I Semester – MCA – C2 Internal Assessment, April - 2025				
Subject: Mathematical Foundations for Computer Science				
Time: 75 Minutes			**Max. Marks: 30**	
PART A				
Answer the following			**2 x 10 = 20**	
1	a.	Define the following with suitable examples. (a) Vector space (b) Basis of a vector space (c) Orthogonal vectors	CO2	6
	b	Discuss the properties of determinants.	CO2	4
OR				
2	a.	If $x + y + z = 9$, $2x - 3y + 4z = 13$ and $3x + 4y + 5z = 40$. Find x, y and z by using Gauss – elimination method.	CO3	6
	b.	Using Gauss- Jordan method, find the inverse of $A = \begin{bmatrix} 2 & 2 & 3 \\ 2 & 1 & 1 \\ 1 & 3 & 5 \end{bmatrix}$.	CO3	4
3	a.	Solve the following tridiagonal system of linear algebraic equations using Thomas Algorithm. $3x_1 - x_2 = 5$ $2x_1 - 3x_2 + 2x_3 = 5$ $x_2 + 2x_3 + 5x_4 = 10$ $x_3 - x_4 = 1$	CO3	6
	b	Write a note on LU decomposition method.	CO3	4
OR				
4	a.	Solve the system of equations by Gauss- Jacobi's method $26x_1 + 2x_2 + 2x_3 = 12.6$ $3x_1 + 27x_2 + x_3 = -14.3$ $2x_1 + 3x_2 + 17x_3 = 6.0$	CO3	6

P.T.O

	b.	Explain Gauss- Seidel method with its convergence criteria.	CO3	4
PART B				
Answer the following			**2 x 5 = 10**	
5	Without expanding, prove that $\begin{vmatrix} a & a+b & a+b+c \\ 2a & 3a+2b & 4a+3b+2c \\ 3a & 6a+3b & 10a+6b+2c \end{vmatrix} = a^3.$		CO2	5
OR				
6	Define linearly dependent set with an example. Consider the vector space V= $\mathbf{R^3(R)}$. Is {(1,1,2), (1,2,0), (0,2,1)} linearly independent subset of V?		CO2	5
7	Explain Cramer's rule with an example.		CO3	5
OR				
8	Solve the following equations by Crout's method. $x_1 + x_2 = 2$ and $2x_1 + 3x_2 = 5$		CO3	5

Code:MCA24A104

St. Philomena's College (Autonomous), Mysore

I Semester – MCA – C2 Internal Assessment, April - 2025

Subject: COMPUTER ORGANISATION & ARCHITECTURE

Time: 75 Minutes **Max. Marks: 30**

PART A

Answer the following **2 x 10 = 20**

1	a.	What is Decoder ? Explain the operation of 3:8 decoder with a neat block diagram , circuit diagram and Truth table.	CO2	6
	b.	Implement Full adder using Appropriate decoder	CO2	4
		OR		
2	a.	What is MUX ? Explain the principle of operation of 4:1 MUX	CO2	4
	b.	Implement the following Boolean function using Appropriate MUX F = m2+m5+m6+ m8+m9+m11+m13+m14	CO2	6
3	a.	What are the differences between Sequential and combinational logic. Explain the operation of clocked JK FF with a neat circuit diagram and Timing diagram. Also Derive the characteristic table , characteristic equation (Assume the FF responds to +ve edge triggering)	CO3	10
		OR		
4	a.	What is Triggering? Why Edge Triggering is required?	CO3	2
	b.	What is Excitation function? Derive Excitation functions for RS , JK, D and T Flip Flops.	CO2	8

PTO

PART B

Answer the following **2 x 5 = 10**

5	Explain the Basic Operation of a Processor with a neat diagram.	CO3	5

OR

6	What is Bus ? Explain the different types Buses with examples. Explain multibus architecture with a neat diagram.	CO3	5
7	What are the parameters that decides the performance of the computer? Explain the techniques used to improve the performance.	CO3	5

OR

8	What do you mean by Previlege Exception. Explain the mechanism of operation.	CO3	5

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Code: MCA24A102

ST. PHILOMENA'S COLLEGE (AUTONOMOUS), MYSORE

I Semester – MCA - C2 Internal Assessment, April - 2025

Subject: Operating System

Time: 75 Minutes **Max. Marks: 30**

PART A

Answer the following **2 x 10 = 20**

1	a.	What is internal and external fragmentation?	CO3	4
	b	Explain in detail how deadlock can be prevented.	CO3	6

OR

2		Consider the following snapshot of a system. Answer the following using banker's algorithm. i) Is the system in safe state? If so, give the safe sequence. ii) If the process P2 request (0,1,1,3) resources can it be granted immediately?	CO3	10

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	2	0	0	1	4	2	1	2	3	3	2	1
P_1	3	1	2	1	5	2	5	2				
P_2	2	1	0	3	2	3	1	6				
P_3	1	3	1	2	1	4	2	4				
P_4	1	4	3	2	3	6	6	5				

3	a.	Discuss briefly about file attributes in a file system.	CO4	5
	b	Explain the various operations performed on a directory.	CO4	5

OR

4		"Given a disk queue with requests for I/O to blocks on cylinders in the following order: 98, 183, 37, 122, 14, 124, 65, 67 (starting from the current head position at cylinder 53), calculate the total head movement for FCFS, SSTF, and SCAN disk scheduling algorithms. Which algorithm results in the least head movement in this case?"	CO4	10

PTO

PART B

Answer the following **2 x 5 = 10**

5	What is a deadlock? What are the necessary conditions for the deadlock to occur?	CO3	5

OR

6	Explain resource allocation graph in detail.	CO3	5
7	Explain the various access methods of files.	CO4	5

OR

8	Explain tree structured directory structure.	CO4	5

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