

**M.C.A. DEGREE EXAMINATION —
DECEMBER, 2019.**

Second Year

COMPUTER GRAPHICS

(Including Lateral Entry Candidates)

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. What are applications of computer graphics?
2. Explain line drawing algorithms.
3. What are the principles of transformation?
4. Explain aspect ratio.
5. What is the viewing process?
6. Describe Z-buffer algorithm.
7. Write short notes on command languages.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain in detail line drawing algorithms.
9. Describe in detail video display generation.
10. Discuss 2D transformations.
11. Bring out matrix representation and composite transformation.
12. Summarize Cohen Sutherland algorithm.
13. Explain in detail hidden surface algorithm.
14. Present a tutorial on User Interface Design.

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MCA-12

**M.C.A. DEGREE EXAMINATION —
DECEMBER, 2019.**

Second Year

DESIGN AND ANALYSIS OF ALGORITHMS

Time : 3 hours

Maximum marks : 75

SECTION A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Define Isomorphism with suitable examples.
2. How do you represent a graph in adjacency list?
3. What are the types of problem solving methods?
4. What is depth and height of a tree?
5. How does quick sort work?
6. What is the complexity of binary search?
7. What is the use of Ackermann's function and explain it?

SECTION B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain about the program testing and documentation in detail.
9. Write an algorithm for travelling salesman problem. What are the applications of travelling salesman problem?
10. Which sorting technique is best? Explain it in detail.
11. What is linked list and list its types?
12. Write the recursive algorithm for computing Fibonacci numbers and solve its recurrence relation.
13. Write Binary search and linear search algorithm.
14. Which is the best sorting technique when the list is already sorted?

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MCA-13

**M.C.A. DEGREE EXAMINATION –
DECEMBER, 2019.**

Second Year

ACCOUNTING AND FINANCE ON COMPUTER

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. What are the objectives of Financial Accounting?
2. Explain the tools and Techniques of Financial Statement.
3. Define cost Accounting. Explain the Element of Cost.
4. Explain the Factors affecting Working Capital Management.

5. From the following particulars prepare a Balance Sheet of Mr. X, for the year ended 31st March, 2019.

Capital Rs.2,00,000 ; Drawings Rs.40,000 Cash In Hand Rs.20,000 ; Loan from Bank Rs.40,000; Sundry Creditors Rs.40,000; Bills Payable : Rs.20,000; Bank Overdraft Rs.20,000; Goodwill Rs.60,000; Sundry Debtors Rs.80,000; Land and Building Rs.50,000; Plant and Machinery: Rs.80,000; Investment: Rs.20,000; Bills Receivable: Rs.10,000.

6. From the following Balance Sheet, prepare Comparative Balance Sheet of Sun Ltd.:

Particulars	Note No.	31st March, 2019 (Rs)	31st March, 2018 (Rs)
I. EQUITY AND LIABILITIES			
1. Shareholder's Funds			
(a) Share Capital		3,50,000	3,00,000
2. Non-Current Liabilities			
Long-term Borrowings		1,00,000	2,00,000
3. Current Liabilities:			
Trade Payables		1,50,000	1,00,000
Total		6,00,000	6,00,000
II. ASSETS			
1. Non-Current Assets			
Fixed Assets (Tangible)		4,00,000	3,00,000
2. Current Assets			
Trade Receivables		2,00,000	3,00,000
Total		6,00,000	6,00,000

7. A Manufacturing company shows the trading result for two periods

Particular	Sales	Profit
2018	20,000	1,000
2019	18,000	400

Calculate

- (a) P/V Ratio
- (b) Fixed Cost
- (c) Break Even Points.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

- 8. Explain the Nature and Scope of Financial Accounting.
- 9. Explain the Zero base Budgeting.
- 10. Prepare Trading and Profit and Loss account for the year ended 31st March 2017 and a Balance sheet as on that date from the following Balance of Mr. Akilan

Particular	Rs
Drawings	45,000
Building	60,000
Bill Receivable	6,000
Purchases	51,000
Carriage Inwards	1,000
Salaries	35,000
Discount (Dr)	1,100
Bank	25,000
Debtors	45,000
Sales Return	2,000
Bill Payable	35,000
Sales	2,18,000
Capital	1,60,000
Goodwill	90,000
Machinery	40,000
Opening Stock	40,000
Wages	26,000
Carriage Outwards	500
Rent	3,000
Repairs	2,300
Cash	1,600
Bad Debts	1,200
Furniture	6,000
Advertisements	3950
Creditors	70,000
Purchase Return	2,650

Adjustment:

- (a) Closing stock Rs.35,000
- (b) Depreciate Machinery and Furniture by 10%
- (c) Outstanding Wages Rs.1,500
- (d) Prepare Advertisements Rs.500
- (e) Create 5% on Debtors for bad debts and as provision.

11. Prepare a Cash Flow Statement on the basis of the information given in the Balance Sheet of Libra Ltd. as at 31st March, 2013 and 31st March 2012:

Particulars	Note No.	31st March, 2018 (Rs)	31st March, 2018 (Rs)
I. EQUITY AND LIABILITIES			
1. Shareholders' Funds			
(a) Share Capital		8,00,000	6,00,000
(b) Reserves and Surplus		4,00,000	3,00,000
2. Non-Current Liabilities			
Long-term Borrowings		1,00,000	1,50,000
3. Current Liabilities			
(a) Trade Payables		40,000	48,000
Total		13,40,000	10,98,000

Particulars	Note No.	31st March, 2018 (Rs)	31st March, 2018 (Rs)
II. ASSETS			
1. Non-Current Assets			
(a) Fixed Assets:			
Tangible Assets		8,50,000	5,60,000
(b) Non-Current Investments		2.32,000	1,60,000
2. Current Assets			
(a) Current Investments		50,000	1,34,000
(b) Inventories		76,000	82,000
(c) Trade Receivables		38,000	92,000
(4) Cash and Cash Equivalentents		94,000	70,000
Total		13,40,000	10,98,000

12. Draw up flexible budget for overhead expenses on the basis of the following data and determine the over head rates at 70%, 80% and 90% plant capacity

Particular	At 70% Capacity	At 80% Capacity	At 90% Capacity
Variable Overheads			
Indirect labour		12,000	
Stores		4,000	
Semi Variable Over Heads		30,000	
Power (30% Fixed)		4,000	
Repairs (60% Fixed)			

Particular	At 70% Capacity	At 80% Capacity	At 90% Capacity
Fixed Overheads		11,000	
Depreciation		4,000	
Insurance		10,000	
Salary			
Total		75,000	

13. From the particulars given below write up the stores ledger card:

Date	Purchased	Issues	
	Qty. (Units)	(Rs.)	Per Unit
2019 January 1 (opening stock)	4,000 units	4	--
January 5	2,000 units	6	--
January 7	--	--	3,000 units
January 10	6,000 units	8	--
January 12	--	--	4,400 units
January 15	4,000 units	10	—
January 17	--	--	2,000 units
January 18	--	--	1,200 units
January 25	6,000 units	10	--
January 29	--	--	6,000 units

Adopt the LIFO method of issue and ascertain the value of the closing stock.

14. From the following Information, Prepare a Summarized Balance Sheet as on 31.3.2017.

- (a) Working Capital - Rs.1,20,000
 - (b) Reserves and Surplus - Rs.80,000
 - (c) Bank Overdraft - Rs.20,000
 - (d) Fixed Asset to proprietary Ratio - 0.75 : 1
 - (e) Current Ratio - 25 : 1
 - (f) Liquid Ratio - 1.5:1
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MCA-14

**M.C.A. DEGREE EXAMINATION –
DECEMBER, 2019.**

Second Year

COMMUNICATION SKILLS

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. What are the objectives of communication?
2. Write short notes on report writing.
3. What are the advantages of brain storming?
4. How must you behave in a group discussion?
5. Describe mock interview.
6. What are the tools for personality identification?
7. Explain mock meetings and seminars.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Point out some strategies to improve your listening skill.
 9. What is downward communication? How would you arrest effectively the information loss in the process?
 10. Explain in detail reading and writing styles. How can improve your English language writing?
 11. What are different types of interviews? Explain in detail.
 12. What is the use of graphs and charts? Explain in detail different types of writing techniques.
 13. Give some examples of nonverbal behavior and its body language.
 14. Explain in detail body language as powerful communication.
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MCA-15

**M.C.A. DEGREE EXAMINATION –
DECEMBER, 2019.**

Second Year

COMPUTER NETWORKS

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Describe the uses of computer networks.
2. Brief about elementary data link protocols.
3. Highlight the features of Point-to-Point protocol (PPP).
4. Describe the network layer design issues.
5. What is Subnet? Explain its uses.
6. Tabulate the primitives for the simple transport service.
7. Brief about Domain Name System (DNS).

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Discuss the three main categories of wireless networks.
9. Elaborate on guided transmission media.
10. Explain the function-of Petri Net Model with an example.
11. Outline the concept of Carrier Sense Multiple Access (CSMA) protocols.
12. Explain the operation of distance vector routing algorithm with an example.
13. Summarize the elements of transport protocols.
14. Give a note on functions provided by email system.

M.C.A. DEGREE EXAMINATION —
DECEMBER, 2019.

Second Year

OPERATIONS RESEARCH

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Write down the Limitations of Linear Programming.
2. Solve the following LPP by using graphical method

$$\text{Maximize } z = 3x_1 + 4x_2$$

Subject to

$$4x_1 + 2x_2 \leq 80$$

$$2x_1 + 5x_2 \leq 180$$

$$x_1, x_2 \geq 0$$

3. A firm produces two products A and B. Each product must be processed through two departments namely 1 and 2. Department 1 has 30 hours of production capacity per day, and department 2 has 60 hours. Each unit of product A requires 2 hours in department 1 and 6 hours in department 2. Each unit of product B requires 3 hours in department 1 and 4 hours in department 2. Managements has rank ordered the following goals it would like to achieve in determining the daily product mix:

P_1 : Minimize the underachievement of joint total production of 10 units.

P_2 : Minimize the underachievement of producing 7 units of product B.

P_3 : Minimize the underachievement of producing 8 units of product A. Formulate this problem as a Goal Programming model.

4. Write down the general algorithm for solving Dynamic Programming Problem.
5. The production department of company requires 3,600 kg of raw material for manufacturing a particular item per year. It has been estimated that the cost of placing an order is Rs 36 and the cost of carrying inventory is 25 percent of the investment in the inventories. The price is Rs 10 per kg. Help the purchase manager to determine an ordering policy for raw material.

6. In a railway marshalling yard, goods trains arrive at a rate of 30 trains per day. Assuming that the inter-arrival time follows an exponential distribution and the service time (the time taken to hump a train) distribution is also exponential with an average of 36 minutes.. Find (a) expected queue size and (b) probability that the queue size exceeds 10.
7. Find the range of values of p and q that will render the entry $(2, 2)$ a saddle point for the game:

		Player B		
	Player A	B ₁	B ₂	B ₃
A ₁		2	4	5
A ₂		10	7	q
A ₃		4	p	6

PART B — ($5 \times 10 = 50$ marks)

Answer any FIVE questions.

8. Use simplex method to solve the LPP

$$\text{Maximize } Z = 4x_1 + 10x_2$$

Subject to

$$2x_1 + x_2 \leq 50$$

$$2x_1 + 5x_2 \leq 100$$

$$2x_1 + 3x_2 \leq 90$$

$$x_1, x_2 \geq 0.$$

9. Solve the following transportation problem:

	I	II	III	IV	Supply
A	21	16	25	13	11
B	17	18	14	23	13
C	32	27	18	41	19
Demand	6	10	12	15	43

10. Find the optimum integer solution to the following all-IPP :

$$\text{Maximize } z = x_1 + 2x_2$$

Subject to

$$x_1 + x_2 \leq 7$$

$$2x_1 \leq 11$$

$$2x_2 \leq 7$$

$x_1, x_2 \geq 0$ and are integers.

11. A super market has two sales girls at the sales counters. If the service time for each customer is exponential with a mean of 4 minutes, and if the people arrive in a Poisson fashion at the rate of 10 an hour, then calculate the (a) probability that a customer has to wait for being served? (b) expected percentage of idle time for each sales girl? (c) if a customer has to wait, what is the expected length of his waiting time?

12. A shop owner daily places orders for goods that will be delivered 7 days later (i.e. the reorder lead time is 7 days). On a certain day, the owner has 10 items in stock. Furthermore, on 6 previous days, he has already placed orders for the delivery of 2, 4, 1, 10, 11 and 5 items in that order, over each of the next 6 days. To facilitate computation, we shall assume $C_h = \text{Re } 0.15$ and $C_s = \text{Re } 0.95$ and the distribution requirement over a 7-day period (x') is: $f(x') = 0.02 - 0.0002x'$. How many items should be ordered for the 7th day hence?
13. A company is currently involved in negotiations with its union on the upcoming wage contract. Positive signs in table represent wage increase while negative signs represent wage reduction. What are the optimal strategies for the company as well as the union? What is the game value?

Conditional costs to the company (Rs in lakhs)

		Union Strategies			
		U ₁	U ₂	U ₃	U ₄
Company Strategies	C ₁	0.25	0.27	0.35	-0.02
	C ₂	0.20	0.16	0.08	0.08
	C ₃	0.14	0.12	0.15	0.13
	C ₄	0.30	0.14	0.19	0.00

14. Customers arrive at a milk booth for the required service. Assume that inter-arrival and service times are constant and given by 1.8 and 4 time units respectively. Simulate the system by hand computations for 14 time units. What is the average waiting time per customer? What is the percentage idle time of the facility? (Assume that the system starts at $t = 0$).

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MCA-17

**M.Sc. DEGREE EXAMINATION –
DECEMBER 2019.**

Second Year

OPERATING SYSTEMS

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Explain in details about the system calls that are provided by operating systems.
2. Write short note on process termination.
3. Discuss with example about round robin scheduling.
4. Explain the resources in deadlock.
5. Briefly explain not recently used page replacement algorithm.
6. Explain in detail about paging with neat diagram.
7. Write about directory operations.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Briefly explain the history of Operating Systems.
 9. Examine the various proposals for achieving mutual exclusion.
 10. Explain the basic concepts of scheduling.
 11. Discuss in details about Device Independent I/O Software.
 12. Explain memory management with linked list neat diagram.
 13. Briefly explain segmentation.
 14. Explain the properties of files.
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MCA-18

**M.C.A. DEGREE EXAMINATION –
DECEMBER, 2019.**

Second Year

OBJECT ORIENTED ANALYSIS AND DESIGN

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Explain the evolution of the Object Model briefly.
2. What are the measures in building quality classes?
3. Describe about CRC cards.
4. Explain in brief about the key abstraction mechanisms.
5. Elucidate the micro development process.
6. Elaborate the concept of Refactoring.
7. Write about Use Cases with a diagram.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain in detail The elements of the Object Model.
 9. Detail out the relationships about classes with appropriate diagrams.
 10. Elaborate in detail about the Object Oriented Analysis.
 11. Write about State Diagram and Interaction Diagram in detail with suitable examples.
 12. Elucidate the macro development process in detail.
 13. Write down the detail explanation on Pragmatics.
 14. Explain with an example on Class Diagram.
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**M.C.A. DEGREE EXAMINATION —
DECEMBER, 2019.**

Second Year

INTERNET PROGRAMMING

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Brief on the history of internet.
2. Write short notes on LAN topologies.
3. List and explain the basic tags used for designing a html page with an example.
4. Discuss the benefits of Java
5. What is an Event and Method in VB Script. Give Example?
6. Explain the steps required to add multiple movies to shockwave
7. What is VDO live technology?

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Discuss accessing of data in Internet for large organizations
 9. Brief on Document Type Definition in SGML
 10. Brief on Java Development environment and JVM
 11. Explain the advantages and creation of Active X controls
 12. Discuss the protocols used in mail function
 13. Brief on Design issues in Web
 14. Brief on formatting using CSS.
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**M.C.A. DEGREE EXAMINATION —
DECEMBER, 2019.**

Second Year

VISUAL PROGRAMMING

Time : 3 hours

Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. What are the VC++ components?
2. What are the types of Splitter Window?
3. Explain the types of DLLS.
4. Write the difference between Ordinary control and ActiveX control.
5. What is multi document interface?
6. Explain some types of Resources.
7. Write a VC++ program for chat application.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Explain in detail about the architectural overview of windows programming.
 9. Explain the two methods used for getting Device Context Handle.
 10. Explain GDI function and GDI primitives.
 11. Define Serialization. Explain it briefly.
 12. Explain MFC library in detail.
 13. Explain data access through ODBC with example.
 14. Discuss on various tools in a Tool box.
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