

M.C.A. DEGREE EXAMINATION, DECEMBER 2008.

First Year

Paper I — INFORMATION TECHNOLOGY

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. Define information. What are the types and properties of information?
2. Discuss the features of various generations of computers.
3. Define 'software'. Explain various types of software with examples for each.
4. Explain the topology and architecture of LAN.
5. Define hardware. Explain various output devices of a computer.

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. What are the various types of resistance to information flow?
7. What are the computer applications in production planning?
8. Define EDI. What are its benefits?
9. Write a short note on the applications of MS-Office.
10. Explain the asynchronous mode of data transmission.
11. Explain the characteristics of low-level languages.
12. Distinguish between internet and intranet.
13. What are the applications of computers in telecommunication?

SECTION C — (5 × 1 = 5 marks)

Answer ALL of the following.

14. (a) Mainframes
(b) Primary storage
(c) Communication protocols
(d) Assembler
(e) Multimedia.

First Year

Paper II — PROGRAMMING WITH C++

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. Define OOP. Explain how does it differ from POP.
2. Explain the concept of message passing in C++ with suitable examples.
3. Define string handling and explain various string handling functions in C++ with examples.
4. Define constructor. Illustrate different types of constructors.
5. What are templates? Explain how a normal function can be declared as a template function.

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. Define type casting. What are explicit and implicit type conversions?
7. What is a manipulator? Write a C++ program to display a given decimal number in hexadecimal and octal format.
8. Write a program in C++ to calculate the number of individual digits of an entered number.
9. What are inline functions? Enumerate its advantages and disadvantages.
10. Write a C++ program to display reverse string of the entered string.
11. Write a program in C++ to overload + binary operator.
12. Distinguish between operator overloading and function overloading.
13. Write a program to create a template to find the maximum value stored in an array.

SECTION C — (5 × 1 = 5 marks)

Answer ALL of the following.

14. (a) What is data abstraction?
(b) Define identifiers.
(c) What is 'this pointer'?
(d) What are classes?
(e) What is a vector?

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Paper III — COMPUTER ORGANIZATION

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. Describe in detail the history of computers.
2. Given an overview of computer memory system.
3. Explain different levels of a RAID scheme.
4. Explain Booth's algorithm for multiplication of signed binary numbers.
5. Explain the internal structure of CPU with a neat diagram.

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. Give a block diagram of a CPU and explain its parts.
7. Explain the structure of a system bus.
8. Write short notes on cache memory.
9. Compare and contrast a tape drive and disk drive.
10. Write a brief note on interrupt-driven I/O.
11. Explain the procedure of performing multiplication of unsigned binary integers.
12. Explain instruction cycle.
13. Write how a floating point can be represented in the memory.

SECTION C — (5 × 1 = 5 marks)

Answer ALL of the following.

14. Define computer organization.
 15. What is an interrupt?
 16. What is a magnetic disk?
 17. Define unsigned integers.
 18. Define MMX system.
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M.C.A. DEGREE EXAMINATION, DECEMBER 2008.**First Year****Paper IV — DATA STRUCTURES****Time : Three hours****Maximum : 75 marks****SECTION A — (3 × 15 = 45 marks)****Answer any THREE of the following.**

1. What is an algorithm? Explain the space and time complexity of an algorithm.
2. Define an array. Explain the implementation of one-dimensional array.
3. Implement the linked representation of a linear list by performing insert and delete operations.
4. Define a binary tree and explain various ways of representing binary trees.
5. Define quick sort. Write an algorithm to implement quick sort and discuss its complexity.

SECTION B — (5 × 5 = 25 marks)**Answer any FIVE of the following.**

6. Distinguish between primitive and non-primitive data structures.
7. Explain multi-dimensional arrays.
8. What is a manipulation function? Write any two string manipulation functions.
9. Write an algorithm to evaluate post-fix expression using stacks.
10. Write short notes on pointers and their implementation.
11. What is a threaded binary tree? Explain.
12. Write an algorithm for bubble sort.
13. Explain the procedure for binary search technique.

SECTION C — (5 × 1 = 5 marks)**Answer ALL of the following.**

14. (a) What is a data type?
(b) What are queues?
(c) Define stack.
(d) What is QINSERT?
(e) Define procedure.

Paper V — OPERATING SYSTEMS

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. Define an OS. Explain various types of OS.
2. Explain any two CPU scheduling algorithms.
3. What is demand paging? Explain the procedure for handling a page fault.
4. Write short notes on:
 - (a) Program threats
 - (b) System threats.
5. Discuss disk scheduling algorithms.

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. What is a process? Explain state diagram of a process.
7. Define co-operating processes. What is the need for it in a multiprocessing system?
8. Explain the semaphore synchronization tool.
9. What is spooling? Explain.
10. What are sequential and random file accessing methods?
11. Distinguish between synchronous and asynchronous I/O.
12. Define encryption. How does it work?
13. Explain Hydra capability-based protection system.

SECTION C — (5 × 1 = 5 marks)

Answer ALL of the following,

14. What is a scheduler?
15. What is an interrupt?
16. Define page fault.
17. Define polling.
18. What is security?

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. Describe various types of association between files with examples.
2. Define a pointer. Explain various types of it.
3. Discuss the guidelines for mapping a conceptual data model into a relational data model.
4. Explain different DML retrieval commands of IDMS.
5. Discuss different database recovery procedures.

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. Define a database system. Discuss its advantages.
7. Define meta data with an example.
8. What is an E_R model? Explain with an example.
9. Illustrate queue data structure with an example.
10. Explain the steps involved in the implementation design.
11. Give brief note on BCNF with an example.
12. Write a brief note on special relational set operators.
13. Distinguish between relational algebra and relational calculus.

SECTION C — (5 × 1 = 5 marks)

Answer ALL of the following.

14. (a) What is one-to-association?
(b) Define data structure.
(c) Define normalization.
(d) What is an address pointer?
(e) What is a lock?

First Year

Paper VII — ACCOUNTS AND FINANCE

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. Classify costs with suitable examples.
2. Explain financial analysis that may be used to interpret financial statements.
3. What are the objects and uses of subsidiary books?
4. How do you prepare final accounts of company?
5. What are the issues in the management of working capital?

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. Matching concept.
7. Journal proper.
8. Suspense account.
9. Budgetary control techniques.
10. Finance function.
11. Uses of funds flow statement.
12. Techniques of cost accounting.
13. Journalise the following transactions, post them in the ledger and balance the accounts as on 31st December, 1998 :

December

- 1 Rajini started business with a capital of Rs. 50,000
- 2 He purchased furniture for Rs. 5,000
- 3 He bought goods on credit from Vinod for Rs. 8,000
- 14 He sold goods to Suresh for Rs. 5,000
- 15 He received cash from Suresh Rs. 3,000
- 18 He purchased goods for cash Rs. 12,000
- 27 He sold goods for cash Rs. 8,000
- 28 He paid rent Rs. 1,200
- 31 He paid Vinod Rs. 3,000 on account

SECTION C — (5 × 1 = 5 marks)

Answer ALL of the following.

14. Accounting cycle.
15. Closing entry.
16. Ratio.
17. Fund.
18. Financial decision making.

(DMCA 108)

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Paper VIII — DISCRETE MATHEMATICS

Time : Three hours

Maximum : 75 marks

SECTION A — (3 × 15 = 45 marks)

Answer any THREE of the following.

1. Obtain the DNF and CNF for the following formula
 $(P \rightarrow (Q \wedge R)) \wedge (\sim P \rightarrow (\sim Q \wedge \sim R)).$
2. Let $X = Y = Z = R$ and let $f : x \rightarrow y$ and $g : y \rightarrow z$ are defined by $f(x) = x + 1$ and $g(y) = y^2 + 2$. Find $(g \circ f)$, $(f \circ f)$, $(g \circ g)$ and $(f \circ g)$.
3. Solve the recurrence relation corresponding to the Fibonacci sequence, $a_r = a_{r-1} + a_{r-2}$, $r \geq 2$ with $a_0 = 1$, $a_1 = 1$.
4. State and prove Lagrange's theorem.
5. Minimize the following expression and represent in k -map :
 - (a) $w' \oplus y^* (x' \oplus z')$
 - (b) $x' y' zw \oplus yz w' \oplus y' z' \oplus y' w'$.

SECTION B — (5 × 5 = 25 marks)

Answer any FIVE of the following.

6. Construct the truth table for $(P \wedge Q) \iff (\sim P \vee \sim Q)$.
7. Prove by induction,

$$1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}.$$

8. Let $A = \{1, 2, 3, 4, 5, 6\}$. Compute the product of $(2 \ 1 \ 3 \ 5)0(1 \ 6 \ 2)$.
9. Find the number of ways in which 5 boys and 5 girls can be seated in a row if the boys and girls are to have alternative seats.
10. Find the number of ways to seat 5 boys in a row of 12 chairs.
11. Show that every cyclic group of order n is isomorphic to $(\mathbb{Z}_n, +)$.
12. Show that there is a semi group homomorphism between $(\mathbb{N}, +)$ and $(\mathbb{Z}_m, +)$.
13. Design the logic diagram for the expression.

$$f(x \wedge y \wedge z) \vee (x \wedge y' \vee z) \vee (x' \wedge y)$$

SECTION C — (5 × 1 = 5 marks)

Answer ALL the following.

14. What is a symmetric matrix?
 15. Define recursion.
 16. Define recurrence relations.
 17. Define a semi group.
 18. What is a Karnaugh map?
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