

(DMCA101)

Total No. of Questions :18]

[Total No. of Pages : 02

M.C.A.DEGREE EXAMINATION, MAY– 2018

First Year

INFORMATION TECHNOLOGY

Time :3 Hours

Maximum Marks :70

---

---

**SECTION - A**

**Answer any three of the following questions.**

**(3 x 15 = 45)**

- Q1)** Write about capabilities expected of information systems in modern organizations.
- Q2)** Discuss various primary and secondary storage devices.
- Q3)** Explain how a database approach overcomes the problems associated with the traditional file environment and also describe different data models.
- Q4)** Discuss different categories of programming languages and their characteristics.
- Q5)** Explain about evaluation of internet and describe various services of internet.

**SECTION - B**

**Answer any five of the following questions.**

**(5 x 4 = 20)**

- Q6)** Describe the components of computer-based information systems.
- Q7)** Write about Porter's five forces Model.
- Q8)** Describe about different system software's.
- Q9)** Write about star and ring network topologies.
- Q10)** Write about different types of data transmission.
- Q11)** Briefly explain about client/server computing and peer-to-peer computing.
- Q12)** Differentiate internet and intranet.
- Q13)** Write about services of operating system.

**SECTION - C**

**Answer all of the following questions. (5 x 1 = 5)**

***Q14)*** What is meant by business pressure?

***Q15)*** Define software package.

***Q16)*** Define network protocol.

***Q17)*** Define flash memory.

***Q18)*** What is web browser?



(DMCA102)

Total No. of Questions : 18]

[Total No. of Pages : 02

M.C.A. DEGREE EXAMINATION, MAY – 2018

First Year

PROGRAMMING WITH C++

Time : 3 Hours

Maximum Marks :70

---

---

**SECTION - A**

**Answer any three questions. (3 x 15 = 45)**

- Q1)** Discuss different classification of Operators in C++.
- Q2)** Illustrate function overloading and parameter passing mechanism in C++.
- Q3)** How to declare and initialize the strings in C++? Explain about different string handling functions with example.
- Q4)** What is inheritance? Discuss different types inheritance with proper examples.
- Q5)** Explain about function templates and class templates with suitable example.

**SECTION - B**

**Answer any five questions. (5 x 4 = 20)**

- Q6)** Write about constants and variables in C++.
- Q7)** Write about while and do – while loops in C++.
- Q8)** Explain about friend function with suitable example.
- Q9)** Write about parameter constructor and copy constructor in C++.
- Q10)** Write about dynamic binding and late binding in C++.
- Q11)** Explain about nested classes with example.
- Q12)** What is operator overloading? Give the restrictions.
- Q13)** Write short notes on vectors.

**SECTION - C**

**Answer all questions.** (5 x 1 = 5)

**Q14)** What is enumerated data type?

**Q15)** Define virtual function.

**Q16)** What is use of this pointer?

**Q17)** Define encapsulation.

**Q18)** Define template.



(DMCA103)

Total No. of Questions : 18]

[Total No. of Pages : 02

M.C.A. DEGREE EXAMINATION, MAY – 2018

First Year

COMPUTER ORGANIZATION

Time : 3 Hours

Maximum Marks :70

---

---

**SECTION - A**

**Answer any three questions. (3 x 15 = 45)**

- Q1)** List and briefly define the main structural components of a computer.
- Q2)** What type of transfers must a computer's interconnection structure (e.g., bus) support.
- Q3)** What common characteristics are shared by all RAID levels?
- Q4)** Explain briefly regarding Floating Point Arithmetic.
- Q5)** Discuss about Instruction Pipelining.

**SECTION - B**

**Answer any five questions.**

**(5 x 4 = 20)**

- Q6)** What, in general term, is the distinction between computer structure and computer function.
- Q7)** List and briefly define the functional groups of signal lines for PCI.
- Q8)** Briefly define seven RAID levels.
- Q9)** Define the terms track, cylinder and sector with a neat diagram.
- Q10)** Discuss IEEE standard for Binary Floating Point Representation.
- Q11)** Write about Two's Complement Representation.
- Q12)** How do we determine Pipeline Performance?
- Q13)** Explain Timing of Synchronous Bus Operations.

**SECTION - C**

**Answer all questions.**

**(5 x 1 = 5)**

**Q14)** What is the importance of Addressing Modes?

**Q15)** Discuss about ALU.

**Q16)** Explain Optical Memory.

**Q17)** What is Vacuum tubes?

**Q18)** What is computer top level structures?



(DMCA104)

Total No. of Questions : 18]

[Total No. of Pages : 02

M.C.A. DEGREE EXAMINATION, MAY – 2018

First Year

Data Structures

Time : 3 Hours

Maximum Marks :70

---

---

**SECTION - A**

**Answer any three questions. (3 x 15 = 45)**

- Q1)** Explain about abstract data model and various data structure operations.
- Q2)** Illustrate different pattern matching algorithms with suitable example.
- Q3)** How to represent linked list in computer memory? Write a procedure to insert an element into and delete an element from single linked list with suitable example.
- Q4)** Explain about threaded binary tree and binary search tree operations with example.
- Q5)** The following values are to be stored in hash table: 25, 42, 96, 101, 102, 162, 197. Describe how the values are hashed by using division method of hashing with table size of 7.

**SECTION - B**

**Answer any five questions. (5 x 4 = 20)**

- Q6)** Briefly explain about big O notation and Omega  $\Omega$  notations of algorithm.
- Q7)** What is record? Describe the record storage in compute memory.
- Q8)** Explain any four string handling functions with proper example.
- Q9)** What is recursion? How the recursion is implemented through stack?
- Q10)** Write pseudo code to implement queue operations.
- Q11)** What is AVL tree? Explain L-L and R-L, rotations in AVL trees with example.
- Q12)** Explain about deletion and insertion operations in B – trees.
- Q13)** Explain about insertion sort algorithm with example.

**SECTION - C**

**Answer all of the following questions. (5 x 1 = 5)**

**Q14)** Define time complexity.

**Q15)** What is pointer?

**Q16)** Define circular queue.

**Q17)** Define heap condition.

**Q18)** Define hashing.





(DMCA105)

Total No. of Questions : 18]

[Total No. of Pages : 02

M.C.A. DEGREE EXAMINATION, MAY – 2018

First Year

OPERATING SYSTEMS

Time : 3 Hours

Maximum Marks :70

---

---

**SECTION - A**

**Answer any three of the following questions.**

**(3 x 15 = 45)**

- Q1)** Explain the various types of operating systems.
- Q2)** Explain implementation of producer's/Consumers problem using monitor.
- Q3)** What is paging? Discuss the various page replacement strategies.
- Q4)** Write about the following in detail:  
i) Disk structure  
ii) Indexed allocation  
iii) Shortest-Seek-Time-First (SSTF) scheduling.
- Q5)** Discuss about various threats are detecting prevented by the operating system.

**SECTION - B**

**Answer any five of the following questions.**

**(5 x 4 = 20)**

- Q6)** Describe different process states with neat diagram.
- Q7)** Explain about shortest job first scheduling algorithm with example.
- Q8)** Write about internal and external fragmentation.
- Q9)** Explain about overlays.
- Q10)** Explain the page fault handling routine with diagram.
- Q11)** Write short notes on kernel I/O subsystem.
- Q12)** State the various attributes of file and their purpose.
- Q13)** Explain the terms worm and viruses with example.

**SECTION - C**

**Answer all of the following questions. (5 x 1 = 5)**

***Q14)*** What is turnaround time of process scheduling?

***Q15)*** Define segmentation.

***Q16)*** Define critical section.

***Q17)*** Define demand paging.

***Q18)*** Define deadlock.



(DMCA106)

Total No. of Questions : 18]

[Total No. of Pages : 02

M.C.A. DEGREE EXAMINATION, MAY – 2018

First Year

DATABASE MANAGEMENT SYSTEMS

Time : 3 Hours

Maximum Marks :70

---

---

**SECTION - A**

***Answer any three questions. (3 x 15 = 45)***

- Q1)** What is information system? Discuss components of information.
- Q2)** Explain about Sequential and Indexed file organizations with suitable example.
- Q3)** Discuss different classification of data models based on their physical storage.
- Q4)** Explain about information management description and data manipulation in hierarchical database management systems.
- Q5)** Explain about database recovery mechanism.

**SECTION - B**

***Answer any five questions.***

**(5 x 4 = 20)**

- Q6)** Describe the different associations between field.
- Q7)** Write about physical address pointer and relative address pointer.
- Q8)** Explain about multi list data structure with example.
- Q9)** Write about first and second normal forms with suitable example.
- Q10)** Explain about data volume and usage analysis.
- Q11)** Describe any four DML commands of IDMS.
- Q12)** Write about different relational algebra operations.
- Q13)** Give the responsibilities of DBA.

**SECTION - C**

**Answer all questions.** (5 × 1 = 5)

**Q14)** Define field.

**Q15)** What is meant by metadata?

**Q16)** What is PC – FOCUS?

**Q17)** What is E – R model?

**Q18)** What is concurrency?



(DMCA107)

Total No. of Questions : 18]

[Total No. of Pages : 02

M.C.A. DEGREE EXAMINATION, MAY – 2018

First Year

ACCOUNTS & FINANCE

Time : 3 Hours

Maximum Marks :70

---

---

**SECTION - A**

**Answer any three questions. (3 x 15 = 45)**

- Q1)** Briefly explain about different types of subsidiary books.
- Q2)** Write about errors disclosed and not disclosed by trail balance.
- Q3)** Discuss about elements considered in financial decision making.
- Q4)** Give an overview on accounting ratios and financial ratios.
- Q5)** What is double entry system? How can it be superior to single entry system? Explain.

**SECTION - B**

**Answer any five questions.**

**(5 x 4 = 20)**

- Q6)** Accounting concepts.
- Q7)** Nature of cost accounting.
- Q8)** Need for cash flow statement.
- Q9)** Benefits of Ratio analysis.
- Q10)** Master budget.
- Q11)** Preparation of B.R.S.
- Q12)** Making of journal entries.
- Q13)** Concept of cost analysis.

**SECTION - C**

**Answer all questions.** (5 x 1 = 5)

**Q14)** Working capital.

**Q15)** Cash book.

**Q16)** Adjustments.

**Q17)** Funds flow statement.

**Q18)** Quick ratio.



**SECTION - A**

**Answer any three of the following questions.**

**(3 x 15 = 45)**

- Q1)** a) Prove that, for any three propositions  $p, q, r$ , the compound proposition  $[(p \rightarrow q) \wedge (q \rightarrow r)] \rightarrow (p \rightarrow r)$  is tautology.  
 b) Obtain principle disjunctive normal form of the following.  
 $P \rightarrow \{(p \rightarrow q) \wedge \neg(\neg q \vee \neg q)\}$
- Q2)** a) Prove that  $f^{-1} \circ g^{-1} = (g \circ f)^{-1}$ , where  $f : Q \rightarrow Q$  such that  $f(x) = 2x$  and  $g : Q \rightarrow Q$  such that  $g(x) = x+2$  are two functions.  
 b) On the set of integers, the relation R is defined by “ $aRb$ ” if and only if “ $(a - b)$  is even integer”. Show that R is an equivalence relation.
- Q3)** Solve the following recurrence relations:  
 i)  $a_{n+1} - 2a_n = 2^n, n \geq 0, a_0 = 1$   
 ii)  $a_n = 3a_{n-1} - 2a_{n-2}$  for  $n \geq 2$
- Q4)** a) A non-empty subset S of G is a sub group of  $(G, *)$  iff for any pair of elements  $a, b \in S$ .  
 b) Let G be the set of all nonzero real numbers, for  $a*b = ab/2$ , show that  $(G, *)$  is Abelian group.
- Q5)** What is partial order and partial order set? Draw Hasse diagram for poset  $(P(A), \subset)$  where  $A = \{1, 2, 3, 4\}$  is the power set of A.

**SECTION - B**

**Answer any five of the following questions.**

**(5 x 4 = 20)**

- Q6)** Prove that the logical equivalence of  $[p \wedge (p \rightarrow q) \wedge r] \equiv [(p \vee q) \rightarrow r]$ .
- Q7)** Show that  $\forall x(P(x) \vee Q(x)) \equiv \forall xP(x) \wedge \forall xQ(x)$ .
- Q8)** In how many ways can 4 mathematics books, 3 history books, 3 chemistry books and 2 sociology books be arranged on the shelf so that all books of the same subject are together?

**Q9)** What are the reflexive, symmetric and transitive relations?

**Q10)** Let  $f(x) = x+2$ ,  $g(x) = x-2$ ,  $h(x) = 3x$  for  $x \in \mathbb{R}$  where  $\mathbb{R}$  is set of real numbers.  
Find  $\text{gof}$ ,  $\text{hof}$ .

**Q11)** Show that the semi group  $(\mathbb{Z}, +)$  and  $(E, -)$  where  $E$  is the set of even integers are isomorphic.

**Q12)** Solve the linear recurrence relation:  $a_0 = 4a_{n-1} + 5a_{n-2}$  with  $a_1 = 2$ ,  $a_2 = 6$ .

**Q13)** Let  $G$  be group and let  $a, b, c \in G$ , then show that:

i)  $ab=bc \Rightarrow b=c$

ii)  $(ab)^{-1} = b^{-1}a^{-1}$

### **SECTION - C**

**Answer all of the following questions. (5 x 1 = 5)**

**Q14)** Define monoid.

**Q15)** Define Lattice.

**Q16)** Define binary relation.

**Q17)** Define disjunctive normal form.

**Q18)** What is generating function.

