

(DMCA101)

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M.C.A DEGREE EXAMINATION, DECEMBER – 2018

First Year

INFORMATION TECHNOLOGY

Time : 3 Hours

Maximum Marks : 70

SECTION – A

(3 × 15 = 45)

Answer any THREE questions

- Q1)** What is computer based information systems (CBIS)? Discuss evaluation of CBIS.
- Q2)** Discuss various components and their functioning of the central processing unit.
- Q3)** Explain about different output devices and mention their working principle with neat sketches.
- Q4)** What is the Internet? How it works and discuss different ways to connect internet by the user?
- Q5)** Discuss about network media and network topologies.

SECTION – B

(5 × 4 = 20)

Answer any Five questions.

- Q6)** What are the basic components of information systems?
- Q7)** Describe Classification of Information Systems.
- Q8)** Write about CD – ROM and RAM.
- Q9)** Differentiate system software and application software.
- Q10)** Write about E – R model for database design.
- Q11)** Briefly explain about LAN and WAN.

Q12) Describe various elements of e – mail.

Q13) Explain about any two network topologies with diagrams.

SECTION – C

(5 × 1 = 5)

Answer all questions

Q14) Define the term market pressure.

Q15) What are the text processing soft wares?

Q16) What is IP address?

Q17) Define operating system.

Q18) What is data warehouse?



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M.C.A. DEGREE EXAMINATION, DECEMBER – 2018

First Year

PROGRAMMING with C++

Time : 3 Hours

Maximum Marks

:70

SECTION - A

Answer any THREE questions.

(3 × 15 = 45)

- Q1)** Explain about object oriented features in C++.
- Q2)** Discuss about different control and looping structures in C++.
- Q3)** Explain about various types of constructors and its characteristics.
- Q4)** Illustrate operator overloading with suitable example.
- Q5)** Discuss about function templates and class templates with example.

SECTION - B

Answer any FIVE questions from the following.

(5 × 4 = 20)

- Q6)** Differentiate classes and structures.
- Q7)** Explain about inline functions with suitable example.
- Q8)** Give any four string handling functions.
- Q9)** Illustrate multiple inheritance with example.
- Q10)** Explain virtual base class with proper example.
- Q11)** How to implement polymorphism in C++.
- Q12)** Describe various access specifiers in C++.

Q13) Briefly explain about container classes.

SECTION - C
Answer all questions.

(5 × 1 = 5)

Q14) What is purpose of scope resolution operator?

Q15) What is new and delete operators?

Q16) Define destructor.

Q17) Define arrays.

Q18) Define early binding.



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M.C.A. DEGREE EXAMINATION, DEC. – 2018

First Year

COMPUTER ORGANIZATION

Time : 3 Hours

Maximum Marks : 70

SECTION – A

(3 × 15 = 45)

Answer any THREE questions

- Q1)** What is the key distinguishing feature of a microprocessor?
- Q2)** List and briefly define the possible states that define an instruction execution.
- Q3)** a) How are data written onto to Magnetic disks?
b) How are data read from a Magnetic disks?
- Q4)** Explain briefly regarding Integer Representation.
- Q5)** Discuss about Register Organization.

SECTION – B

(5 × 4 = 20)

Answer any Five questions

- Q6)** Explain Moore's Law.
- Q7)** What is a stored program computer?
- Q8)** Draw and explain a timing diagram for a PCI write operations.
- Q9)** Define the terms seek time, rotational delay, access time and transfer time.
- Q10)** Explain serpentine recording.
- Q11)** Explain converting between different bit lengths.

Q12) Give some advantages and disadvantages of Condition codes.

Q13) Explain Multiple Bus Hierarchies.

SECTION – C

(5 × 1 = 5)

Answer all questions

Q14) What is the importance of Instruction Formats?

Q15) Define Integer Arithmetic.

Q16) What is magnetic tapes.

Q17) What is Integrated circuits (IC)?

Q18) What is Power PC?



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M.C.A. DEGREE EXAMINATION, DEC. – 2018

First Year

DATA STRUCTURES

Time : 3 Hours

Maximum Marks : 70

SECTION – A

(3 × 15 = 45)

Answer any THREE questions from the following

- Q1)** Discuss about algorithm development steps and control structures with flow diagrams.
- Q2)** Explain about how to represent linear arrays, pointer arrays and records in computer memory.
- Q3)** Write a pseudo code to different stack operations and explain various applications of stacks with example.
- Q4)** Explain about insertion and deletion operations in binary tree and also describe tree traversing techniques.
- Q5)** Explain about shell sort and Radix sort with suitable example.

SECTION – B

(5 × 4 = 20)

Answer any Five questions from the following

- Q6)** Describe different data structure operations.
- Q7)** Write an algorithm to find maximum element of given set of data elements.
- Q8)** Write a procedure match string using transition table and transition graph.
- Q9)** Write a pseudo code to insert and delete operation of double linked list.
- Q10)** Explain about circular queue with example.
- Q11)** Construct a binary tree from the traversals given below :

In - order : 1 3 4 6 7 8 10 13 14
Pre - order : 8 3 1 6 4 7 10 14 13

Q12) Write short notes on Red – Black trees.

Q13) Explain about insertion sort algorithm.

SECTION – C

(5 × 1 = 5)

Answer all questions

Q14) Give any two string handling functions?

Q15) What is record?

Q16) Define dequeue.

Q17) What is AVL tree?

Q18) Define open hashing.



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M.C.A. DEGREE EXAMINATION, DECEMBER – 2018

First Year

OPERATING SYSTEMS

Time : 3 Hours

Maximum Marks : 70

SECTION – A

(3 × 15 = 45)

Answer any THREE questions from the following

- Q1)** Discuss different services provided by operating systems.
- Q2)** Explain about inter process communication.
- Q3)** a) Explain what semaphores are, their usage, implementation given to avoid busy waiting and binary semaphores.
b) Discuss the critical section problem. State the basic requirements of critical section problem solution.
- Q4)** Consider the following page reference string : 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. How many page faults would occur for the following replacement algorithms, assuming three frames that all frames are initially empty.
- Q5)** Explain the indexed and linked file allocation methods. Discuss the advantages and disadvantages in those methods.

SECTION – B

(5 × 4 = 20)

Answer any FIVE questions from the following.

- Q6)** Explain about desktop and mainframe operating systems.
- Q7)** Compare paging and segmentation.
- Q8)** State and explain the necessary conditions for deadlock.
- Q9)** Explain Round Robin scheduling algorithm with example.

Q10) Differentiate between Logical versus Physical Address space.

Q11) How can the index blocks be implemented in the indexed allocation scheme?

Q12) Write about different RAID levels.

Q13) Describe different threat categories.

SECTION – C

(5 × 1 = 5)

Answer all questions

Q14) Define context switching.

Q15) Define scheduler.

Q16) Define demand paging.

Q17) What is virtual memory?

Q18) Define worm and virus.



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M.C.A. DEGREE EXAMINATION, DECEMBER – 2018

First Year

DATA BASE MANAGEMENT SYSTEMS

Time : 3 Hours

Maximum Marks : 70

SECTION – A

(3 × 15 = 45)

Answer any Three questions

- Q1)** Illustrate the flow of file processing in conventional file processing systems and give its drawbacks.
- Q2)** Discuss about various data structures used to store the data.
- Q3)** What is need of normalization in data base design? Explain about different normal forms with suitable example.
- Q4)** Explain the guidelines to mapping from conceptual data model into relational and hierarchical data models.
- Q5)** Discuss about different interactive SQL commands with proper syntax.

SECTION – B

(5 × 4 = 20)

Answer any Five questions from the following

- Q6)** Write about Decision support systems and expert systems.
- Q7)** Explain about one – to – many and one – to – one conditional association between record types.
- Q8)** State and describe various database operations.
- Q9)** Describe the classification of data models based on their level of usage data.
- Q10)** Explain Entity – relational model with example.

Q11) Describe various symbols used database action diagram.

Q12) Explain about time stamp protocol in brief.

Q13) What are the types of database failure? Explain in brief.

SECTION – C

(5 × 1 = 5)

Answer all questions

Q14) What is database locking?

Q15) Define metadata.

Q16) What is use of commit and rollback commands?

Q17) Define schema.

Q18) Define normalization.



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M.C.A. DEGREE EXAMINATION, DEC. – 2018

First Year

ACCOUNTS & FINANCE

Time : 3 Hours

Maximum Marks : 70

SECTION – A

(3 × 15 = 45)

Answer any three of the following

- Q1)** What are the advantages of double entry system of Accounting?
- Q2)** Prepare a model of Trial balance of your choice.
- Q3)** What is the difference between cost accounting and financial accounting?
- Q4)** Define cash book. Explain the difference between cash account and cash book.
- Q5)** What are the determinants of working capital?

SECTION – B

(5 × 4 = 20)

Answer any five of the following

- Q6)** Accounting concepts.
- Q7)** Acid – test ratio
- Q8)** What do you understand by Ledger?
- Q9)** What is BRS?
- Q10)** What is a Budgetary control?
- Q11)** What is a Marginal cost?

Q12) Profitability group.

Q13) Three column cash book.

SECTION – C

(5 × 1 = 5)

Answer all questions

Q14) Quick ratio.

Q15) Bank overdraft.

Q16) Journal proper

Q17) Purchases book

Q18) Cash book.



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M.C.A. DEGREE EXAMINATION, DECEMBER – 2018

First Year

DISCRETE MATHEMATICS

Time : 3 Hours

Maximum Marks : 70

SECTION – A

(3 × 15 = 45)

Answer any three from the following

- Q1)** a) Quantify the following arguments into predicate form :
- Some integers are divisible by 5
 - All real numbers are complex numbers.
 - Every living thing is a plant or an animal.
 - Every body likes somebody.
- b) Prove that the logical equivalence of $\{p \wedge (p \rightarrow q) \wedge r\} \equiv [(p \vee q) \rightarrow r]$.
- Q2)** a) The functions $f: R \rightarrow R$ and $g: R \rightarrow R$ are defined by $f(x) = 3x + 7$ for all $x \in R$ and $g(x) = x(x^3 - 1)$ for all $x \in R$ verify that f is one – to – one but g is not.
- b) 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.
- Q3)** a) How many integral solutions are there to $x_1 + x_2 + x_3 + x_4 + x_5 = 20$ where each $x_i \geq 2$?
- b) Solve the following recurrence relation $a_{n+1} - a_n = 3n^2 - n$, for $n \geq 0$, $a_0 = 3$.
- Q4)** a) Show that a group G is abelian if and only if $(ab)^2 = a^2b^2$ for all a, b in G.
- b) Let (G, *) be the set of all non – Zero real numbers and $a * b = \frac{1}{2}ab$. Show that (G, *) is an Abelian group.
- Q5)** Let L be a lattice then, prove that
- $a \vee (b \vee c) = (a \vee b) \vee c$
 - $a \wedge (b \wedge c) = (a \wedge b) \wedge c$
 - $a \vee b = b$ if and only if $a \leq b$
 - $a \wedge b = a$ if and only if $a \leq b$

SECTION – B

(5 × 4 = 20)

Answer any Five questions

- Q6)** Obtain the principle of conjunctive normal form of $(\neg p \rightarrow q) \wedge (q \leftrightarrow p)$.
- Q7)** Show that $(p \rightarrow r) \wedge (q \rightarrow r)$ and $(p \vee q) \rightarrow r$ are logically equivalent.
- Q8)** Let $A = \{1, 2, 3, 4\}$ and R is relation on A denoted by $R = \{(1, 2), (1, 3), (2, 4), (3, 2), (3, 3), (3, 4)\}$. Find R^2 and R^3 .
- Q9)** Let $A = \{1, 2, 3, 4, 12\}$. Consider the partial order of divisibility on A . then draw the Hasse diagram of the poset (A, \leq)
- Q10)** Solve the following recurrence relation :
 $a_{n+1} = a_n + (2n + 3)$, $n \geq 0$ and give that $a_0 = 1$.
- Q11)** Find the recurrence relation and initial condition for the following sequence.
0, 2, 6, 12, 20, 30, 42.
- Q12)** $A = \{a, b, c\}$, $R = \{(a, a), (a, b), (b, c), (c, c)\}$, Find reflexive closure, symmetric closure and transitive closure.
- Q13)** A bowl contains 10 red balls and 10 blue balls. A woman selects balls at random without looking at them
- How many balls must she select to be sure of having at least three balls of the same color?
 - How many balls must she select to be sure of having at least three blue balls?

SECTION – C

(5 × 1 = 5)

Answer all questions

- Q14)** Define group and sub group.
- Q15)** Define equivalence relation.
- Q16)** What is poset?
- Q17)** Define tautology.
- Q18)** Refine recurrence relation.

