

**(DMCA101)**

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**M.C.A.DEGREE EXAMINATION, DEC- 2016**

**(First Year)**

**INFORMATION TECHNOLOGY**

**Time : 3 Hours**

**Maximum Marks : 70**

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**SECTION– A**

**(3x 15 = 45)**

**Answer any3 questions**

- Q1)** Discuss about the contribution of IT industry to our economy.
- Q2)** Define OS. State its types and functions.
- Q3)** a) What is a translator? Describe various types of translators.  
b) Explain different types of printers.
- Q4)** Explain Decision Support System and its characteristics.
- Q5)** Explain the role of MIS in an organization.

**SECTION–B**

**(5 x4 = 20)**

**Answer any 5 questions**

- Q6)** Explain about modem and Router.
- Q7)** Differentiate between LAN and WAN.
- Q8)** What is Text mining?
- Q9)** What is EDP? Explain.

**Q10)** Write a few words about email.

**Q11)** Briefly describe different types of computers.

**Q12)** Differentiate between compiler and interpreter.

**Q13)** Briefly describe about extranet.

**SECTION-C**

**(5 x 1 = 5)**

**Answer all questions**

**Q14)** Define FTP.

**Q15)** What is a knowledge base?

**Q16)** Define a web server.

**Q17)** What is http?

**Q18)** What is an assembler?



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**M.C.A. DEGREE EXAMINATION, DEC - 2016**

**(First Year)**

**PROGRAMMING WITH C++**

**Time : 3 Hours**

**Maximum Marks : 70**

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**SECTION- A**

**(3 x 15 = 45)**

**Answer any 3 questions**

- Q1)** Explain control structures in detail.
- Q2)** Explain any 5 string functions with suitable examples for each.
- Q3)** Define constructor. Write a program to implement a dynamic constructor.
- Q4)** Explain virtual functions in detail.
- Q5)** Define a template. Explain function and class templates.

**SECTION-B**

**(5 x 4 = 20)**

**Answer any 5 questions**

- Q6)** Explain container class.
- Q7)** Write a note on *static data members* of a class.
- Q8)** Differentiate between overloading and overriding.
- Q9)** Elaborate any 3 string functions.

**Q10)** Explain the concept of constructor overloading.

**Q11)** Explain inline functions.

**Q12)** Explain different forms of catch()

**Q13)** Explain the access specifiers of a class.

**SECTION-C**

**(5 x 1 = 5)**

**Answer all questions**

**Q14)** Define a constructor.

**Q15)** What is a virtual destructor?

**Q16)** Define scope resolution operator.

**Q17)** What is a reference variable?

**Q18)** What is a friend function?



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**M.C.A. DEGREE EXAMINATION, DEC - 2016**

**(First Year)**

**(Paper - III) : COMPUTER ORGANIZATION**

**Time : 3 Hours**

**Maximum Marks : 70**

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**SECTION- A**

**(3 x 15 = 45)**

**Answer any Three of the following**

- Q1)** Explain Booth multiplication algorithm in detail.
- Q2)** Explain about cache design parameters.
- Q3)** Explain the operational component of a computer.
- Q4)** Explain in detail different secondary storage device organizations.
- Q5)** Discuss IEEE standard for binary floating point arithmetic.

**SECTION-B**

**(5 x 4 = 20)**

**Answer any Five of the following**

- Q6)** Write a note on addressing modes.
- Q7)** Explain logic gates.
- Q8)** What are the functions of CPU?
- Q9)** Write about interrupt service routine.

**Q10)** What are the basic elements of floating-point addition and subtraction?

**Q11)** Write about centralized and distributed arbitration.

**Q12)** Differentiate between RISC and CISC.

**Q13)** Write about the basic rules of Boolean Algebra.

**SECTION–C**

**(5 x 1 = 5)**

**Answer all questions**

**Q14)** What is Buffer Gate?

**Q15)** What is DMA?

**Q16)** What is processor?

**Q17)** What is upward compatible?

**Q18)** What is status register?



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**M.C.A. DEGREE EXAMINATION, DEC - 2016**

**(First Year)**

**DATA STRUCTURES**

**Time : 3 Hours**

**Maximum Marks : 70**

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**SECTION– A**

**(3 x 15 = 45)**

**Answer any 3 questions**

- Q1)** Explain Merge sort and Radix sort techniques using the following data : 5,3,25,6,10,17,1,2,18,8.
- Q2)** Construct a binary search tree using the following data : 48,43,23,38,30,21,43,66 and perform the operations delete 25, insert 6, delete 5 on the constructed tree.
- Q3)** Define a Queue. Explain DUEUE and its operations with a pseudocode.
- Q4)** Write a program to implement stack using SLL.
- Q5)** Write an algorithm to demonstrate the operations performed on a CLL.

**SECTION–B**

**(5 x 4 = 20)**

**Answer any 5 questions**

- Q6)** Explain loop control structures.
- Q7)** State the advantages of linked lists over arrays.
- Q8)** Write a program to find the factorial of a given number using recursion.

**Q9)** Convert the expression  $ac+d/e^f*g$  into post-fix expression with the help of a stack.

**Q10)** Explain Bubble sort with the help of the following values : 38,81,22,48,69,13,93,58.

**Q11)** Explain insert and delete operations on a priority queue.

**Q12)** Explain Binary search and write an algorithm for implementing it.

**Q13)** Explain operations on a DLL.

**SECTION-C**

**(5 x 1 = 5)**

**Answer all questions**

**Q14)** Define pointer dereferencing.

**Q15)** State any 2 uses on a pointer.

**Q16)** Define node in Linked list.

**Q17)** Define sparse matrix.

**Q18)** Define an Almost complete binary tree.





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**M.C.A. DEGREE EXAMINATION, DEC - 2016**

**(First Year)**

**OPERATING SYSTEMS**

**Time : 3 Hours**

**Maximum Marks : 70**

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**SECTION- A**

**(3 x 15 = 45)**

**Answer any 3 questions**

- Q1)** What are the components of OS? State its services.
- Q2)** Explain any 2 page replacement algorithms.
- Q3)** Explain the concept of demand paging.
- Q4)** Explain Dining Philosophers problem. State a solution to it using semaphores.
- Q5)** Discuss the issues in real-time and multiprocessor scheduling.

**SECTION-B**

**(5 x 4 = 20)**

**Answer any 5 questions**

- Q6)** What is Fragmentation? Explain Internal and External Fragmentation.
- Q7)** Explain Dekker's algorithm.
- Q8)** Explain the entries in process control block.
- Q9)** What are the necessary conditions for a deadlock to occur?

**Q10)** Explain about memory mapped I/O.

**Q11)** What is a Monitor? Explain.

**Q12)** Write about partition selection algorithms.

**Q13)** Describe the layered structure of file system.

**SECTION-C**

**(5 x 1 = 5)**

**Answer all questions**

**Q14)** Define Thread.

**Q15)** What is swap space?

**Q16)** Define relocation.

**Q17)** What is thrashing?

**Q18)** What is a worm?



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**M.C.A. DEGREE EXAMINATION, DEC - 2016**

**(First Year)**

**DATA BASE MANAGEMENT SYSTEMS**

**Time : 3 Hours**

**Maximum Marks : 70**

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**SECTION- A**

**(3 x 15 = 45)**

**Answer any 3 questions**

- Q1)** Define DBMS. State its structure.
- Q2)** Elaborate different data models.
- Q3)** Explain various steps involved in database design.
- Q4)** Write an algorithm to construct a b-tree with degree 3 and 2 levels using the following data 300,110,130,250,120,105,150,118,145,135,115,200,140,125.
- Q5)** State the importance of database recovery and discuss about various database recovery procedures.

**SECTION-B**

**(5 x 4 = 20)**

**Answer any 5 questions**

- Q6)** What is a Transaction? Explain its properties.
- Q7)** What is concurrency? How is it achieved in DBMS?
- Q8)** State the applications of hierarchical model.

**Q9)** State how a conceptual model is mapped into a relational model.

**Q10)** Differentiate between 3NF and BCNF.

**Q11)** Illustrate Functional dependency with a suitable example.

**Q12)** Write a short note on the following keys : primary, super, candidate, secondary and super keys.

**Q13)** How is Relational Database model advantageous than other models.

**SECTION-C**

**(5 x 1 = 5)**

**Answer all questions**

**Q14)** What is an Integrity constraint?

**Q15)** What is a Schema?

**Q16)** What are spurious tuples?

**Q17)** What is a weak entity?

**Q18)** Define a composite attribute.



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**M.C.A. DEGREE EXAMINATION, DEC - 2016**

**(First Year)**

**ACCOUNTS & FINANCE**

**Time : 3 Hours**

**Maximum Marks : 70**

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**SECTION- A**

**(3 x 15 = 45)**

**Answer any three of the following**

- Q1)** Define cash book. Explain the difference between cash account and cash book.
- Q2)** What are final accounts? What adjusting entries would you record for the following:
- a) Depreciation,
  - b) Discount allowed,
  - c) Manager's commission,
  - d) Outstanding salary.
- Q3)** What is the difference between cost accounting and financial accounting?
- Q4)** Briefly explain about various financial ratio's. State the limitations of financial ratio's.
- Q5)** Explain briefly the essentials of sound working capital management.

**SECTION-B**

**(5 x 4 = 20)**

**Answer any five of the following**

- Q6)** Accounting concepts.
- Q7)** Advantages of subsidiary books.

**Q8)** Three column cash book.

**Q9)** Funds flow statement.

**Q10)** Financial management.

**Q11)** What do you mean by ABC analysis? Describe its advantages.

**Q12)** Profitability group.

**Q13)** Acid-test ratio.

**SECTION-C**

**(5 x 1 = 5)**

**Answer all the questions**

**Q14)** Cash book.

**Q15)** Purchases book.

**Q16)** Journal proper.

**Q17)** Bank over draft.

**Q18)** Quick ratio.



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**M.C.A. DEGREE EXAMINATION, DEC - 2016**

**(First Year)**

**DISCRETE MATHEMATICS**

**Time : 3 Hours**

**Maximum Marks : 70**

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**SECTION- A**

**(3 × 15 = 45)**

**Answer any three of the following questions**

- Q1)** a) Construct the truth table for,  
 $[(p \rightarrow q) \wedge (q \rightarrow r)] \rightarrow [p \vee q] \rightarrow r$ .
- b) Verify the validity of the following argument using rules of inferences.  
If a baby is hungry, then the baby cries.  
If the baby is not mad, she does not cry.  
If the baby is mad, then she has a red face.  
Therefore, if a baby is hungry then she has a red face.
- Q2)** a) State various properties defined on a relation with example.  
b) Solve the recurrence relation  $a_n - 8a_{n-1} + 21a_{n-2} - 18a_{n-3} = 0$ .
- Q3)** a) Find the number of non-negative integer solutions to the equation  
 $x_1 + x_2 + x_3 = 25$ .  
b) Show that ,  $f(x, y) = x + y$  is a primitive recursive function.
- Q4)** a) Simplify the Boolean expression  $(a + b)' + (a' + b')$ .  
b) Prove that in any non-directed graph, sum of the degrees of the vertices is even.

- Q5)** a) State and Prove Euler's theorem in a plane graph.  
b) Find the Transitive Closure of a relation  $R = \{(a, b), (b, c), (c, d), (d, e)\}$ .

**SECTION-B**

**(5 x 4 = 20)**

**Answer any five of the following questions**

- Q6)** Define isomorphism between two graphs and give an example.
- Q7)** Define Hasse Diagram and give an example.
- Q8)** State all the rules of inferences.
- Q9)** Define Chromatic number of a graph and give an example.
- Q10)** Let  $f(x) = x + 2, g(x) = x^2, h(x) = 10x + 1$ . Then find  $(fog)(x), (goh)(x), (fogoh)(x)$ .
- Q11)** Define Recurrence relation.
- Q12)** Define Tautology, Contradiction and give examples.
- Q13)** Define regular function and give an example.

**SECTION-C**

**(5 x 1 = 5)**

**Answer all questions**

- Q14)** Define Recursive function.
- Q15)** Define POSET.
- Q16)** Define Lattice.
- Q17)** Define Complete graph.
- Q18)** Define Hamiltonian graph.

