(b) What is function overriding ? **3**

(c) What is Inheritance ? What are different types of inheritance in C++ ? Write down the syntax of each of them. **8**

**Unit IV**

**7.** (a) What is a virtual function ? Why is it required ? What is a pure virtual function ? **8**

(b) What is an exception ? What is the significance of catch and throw keywords ? **7**

**8.** (a) What is a template ? Write a template to create class STACK and implement different operations on it. **10**

(b) What are stream error states ? **5**



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# CC-681

## M.C.A. EXAMINATION, Dec. 2017

(Third Semester)

(B. Scheme) (Main & Re-appear)

MCA-501

OBJECT ORIENTED PROGRAMMING USING C++

*Time :* 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

**Note** : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

## Unit I

**1.** (a) Differentiate between the following :

(i) Procedural and Non-procedural Languages

(ii) Object oriented and Object based languages. **8**

(b) What is a reference to variable ? Differentiate between call by reference and call by pointer to a function in program. Give suitable example to illustrate your answer. **7**

**2.** (a) What is a preprocessor directive ? What are the uses of preprocessor directives ? **6**

(b) How can you control access to a class through different access modifiers ? **6**

(c) What is encapsulation ? **3**

## Unit II

**3.** (a) What is a friend function ? What are its properties ? **5**



(b) What is a THIS pointer ? What is the relevance of THIS pointer ? **5**

(c) What is the need of keywords NEW and DELETE ? **5**

**4.** (a) What is a constructor ? Write down the syntax of different constructors available in C++ ? **7**

(b) What are the properties of static data and static member function ? Illustrate with the help of program. **8**

## Unit III

**5.** (a) What is operator overloading ? Which operators can not be overloaded in C++ ? **5**

(b) Write a program to overload + and * operators for a class of complex numbers. **10**

**6.** (a) What is the order of invoking of constructors in different types of inheritance ? **4**

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# CC-682

## M.C.A. EXAMINATION, Dec. 2017

(Third Semester)

(B. Scheme) (Main & Re-appear)

MCA-503

DATABASE MANAGEMENT SYSTEMS

*Time :* 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

**Note** : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

### Unit I

**1.** Define a DBMS. Give its advantages. Also explain the concept of data independence. **15**

**2.** What is ER Model ? Explain specialization and generalization with suitable examples. **15**

## Unit II

**3.** What are Integrity constrints in a relational model ? How ER diagrams are reduced to relations ? Explain. **15**

**4.** Explain the following :

(a) Operations on Relational Algebra

(b) Domain Relational Calculus. **7½,7½**

## Unit III

**5.** What is Functional Dependency ? Explain its various forms. **15**

**6.** What is the specialization of SQL ? Explain different nested queries in it with suitable example. **15**



## Unit IV

**7.** What is the Concurrency Control ? Explain Locking Protocol. **15**

**8.** Explain different types of failures. Also explain "ARIES". **15**

No. of Printed Pages : 03 Roll No. .....

# CC-683

## M.C.A. EXAMINATION, Dec. 2017

(Third Semester)

(B. Scheme) (Main & Re-appear)

MCA-505

OPERATING SYSTEMS

*Time :* 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

**Note** : Attempt any *Five* questions from Sections A, B, C and D, selecting at least *one* question from each Section. All questions carry equal marks.

## Section A

**1.** (a) Differentiate between network and distributed operation system. **6**

(b) Define a virtual machine ? How does an operating system work as a VM manager ? **9**

**2.** What are the services offered by an operating system to its users ? Briefly discuss each. **15**

## Section B

**3.** Can a system detect that some of its processes are starving ? If your answer is yes, explain how it can ? If your answer is no, explain how the system can deal with starvation problem ? **15**

**4.** (a) Explain multilevel feedback queue scheduling with suitable example. **10**

(b) Differentiate between long term and short term scheduler. **5**



## Section C

**5.** Define Thrashing. What is the cause of it ? How does system detects it ? Once the system defects thrashing, what can it do to eliminate this problem ? Discuss with suitable example. **15**

**6.** What do you mean by memory segmentation ? Explain, why is it easier to share a re-entrant module using segmentation than it is to do so when pure paging is used ? **15**

## Section D

**7.** Why do some systems keep track of the type of the files, while others leave it to the users or simply do not implement multiple file types ? Which system is better and why ? **15**

**8.** What are the possible actions an algorithm may initiate after the discovery of the deadlock situation in a system ? Explain each option briefly. **15**

No. of Printed Pages : 03 Roll No. .....

# CC-684

## M.C.A. EXAMINATION, Dec. 2017

(Third Semester)

(B. Scheme) (Main & Re-appear)

MCA-507

ALGORITHM ANALYSIS & DESIGN

*Time :* 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

**Note** : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

### Unit I

**1.** (a) Explain the asymptotic notaton in detail. **8**

(b) Let $f(n)$ and $g(n)$ be asymptotically positive functions. Prove and disprove : **7**

(i) F($n$) = O($g$($n$)) implies $g$(n) = O($f$($n$))

(ii) F($n$) = O(($f$($n$))$^2$)

**2.** Explain Quick sort algorithms with their complexity in worst case and best case. **15**

## Unit II

**3.** What is 0/1 Knapsack Problem ? Solve the following 0/1 Knapsack problem using dynamic programming P = (11, 21, 31, 33), W = (2, 11, 22, 15), C = 40, $n$ = 4. **15**

**4.** (a) Write a greedy algorithm to the Job sequencing with deadlines. **8**

(b) Distinguish between greedy and dynamic Programming. **7**



## Unit III

**5.** Explain travelling salesperson problem using branch and bound. **15**

**6.** (a) Explain graph coloring problems and its applications. **5**

(b) Explain 8 queen's problem using back tracking. **10**

## Unit IV

**7.** Explain NP complete problems. **15**

**8.** Explain Cook's theorem. **15**

**2.** Explain and compare the merits and demerits of Waterfall model and prototyping model. **15**

## Unit II

**3.** What is problem partitioning in design ? Explain and compare functional versus objected oriented design approach. **15**

**4.** What is Information Hiding in Coding ? Explain various programming styles. **15**

## Unit III

**5.** What is Software testing ? Differentiate alpha and beta testing and white box and black box testing. **15**

**6.** Explain the following : **15**

(a) CMM

(b) Quality control and quality assurance.

## Unit IV

**7.** What is software metrics ? Explain metrics for testing. **15**

**8.** Explain the CASE tools and its scope. **15**



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# CC-685

## M.C.A. EXAMINATION, Dec. 2017

(Third Semester)

(B. Scheme) (Main & Re-appear)

MCA-509

SOFTWARE ENGINEERING

*Time :* 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

**Note** : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

## Unit I

**1.** What is Software Engineering ? Explain Software Characteristics. **15**