**P1857**

### [4775]-101

## MCA. (Management Faculty) (Semester - I)
## IT - 11: COMPUTER ORGNIZATION
## (2012 and 2013 Pattern)

*Time : 3 Hours]*                                               *[Max. Marks : 70*

*Instructions to the candidates:*
  *1)   Question No. 1 and 7 are compulsory.*
  *2)   Answer any four from Q.No. 2 to 6.*
  *3)   Figures to the right indicate full marks.*
  *4)   Draw Neat diagram wherever necessary.*

*Q1)* a)   Discuss 64-bit pentium Dual core processor architecture with neat diagram. **[10]**

   b)   Explain Instruction and Execution Cycle. **[5]**

*Q2)* a)   Construct $1 \times 8$ De-multiplexer and explain it with truth table. **[5]**

   b)   Construct D-flip flop and describe its functions. **[5]**

*Q3)* a)   Convert the following: **[5]**

   i)   $(127.6)_8 = (?)_{16}$

   ii)   $(AFED.15)_{16} = (?)_{10}$

   b)   Solve F $(A,B,C,D) = \sum$ $(1,3,5,9,13,15)$ using karnaugh's map. **[5]**

*Q4)* What is DMA? Draw the block diagram of DMA transfer operation. **[10]**

*Q5)* Explain various types of interrupts. **[10]**

*Q6)* a) Compare RISC Vs. CISC architecture. **[5]**

b) What is pipelining? Discuss arithmetic pipelining with flow diagram.**[5]**


*Q7)* Write short notes on any three. **[3 × 5 = 15]**

a) Universal Gates

b) Assembler

c) Types of registers in Microprocessors

d) Micro Programmed Control Memory

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**[4775]-102**

## M.C.A. (Management Faculty) (Semester - I)

## IT - 12 : C PROGRAMMING

## (2012 & 2013 Pattern)

*Time : 3 Hours]*             *[Max. Marks : 70*

*Instructions to the candidates:*

    *1)*     *Question 1 compulsory.*

    *2)*     *Solve any five questions from question number 2 to 7.*

    *3)*     *Assume suitable data whenever necessary.*

    *4)*     *Figure at right hand indicates full marks.*

*Q1)* Answer the following questions. (any four)       **[4 × 5 = 20]**

    a)     What are command line arguments? Explain

    b)     What is the benefit of using an enum rather than #define constant?

    c)     Discuss the precedence of operator in C.

    d)     What are macros?

    e)     List all Dynamic Memory allocation functions.

*Q2)* a)     Find LCM of a number using recursion in C program.      **[5]**

    b)     Write a C program to find the sum of following series.      **[5]**

$$\cos(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots \frac{x^n}{n!}$$

*Q3)* a)     Write a C program that find the sum of lower triangular elements of matrix.      **[5]**

    b)     Write a function to concatenate the two strings without using library function.      **[5]**

*Q4)* a) Find the n<sup>th</sup> bit of a number is one or zero using bit- wise operators.**[5]**

   b) What is ternary operator? Explain with example. **[5]**

*Q5)* Write a graphics C program that accept 'n' points from user and draw a polygon and fill it with cross line pattern. **[10]**

*Q6)* Write a C program to calculate difference between two dates. (use structure variable to store date) **[10]**

*Q7)* Write a C program to read a text file and find out the frequency of each character. **[10]**

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**[4775]-103**

# M.C.A. (Management Faculty) (Semester - I)
## IT - 13 : SOFTWARE ENGINEERING
## (2012 & 2013 Pattern)

*Time : 3 Hours]*                                                                                    *[Max. Marks : 70*

*Instructions to the candidates:*

    *1)    Question No. 1 & 7 is compulsory.*

    *2)    Attempt any three from the remaining.*

    *3)    Figures to the right indicate full marks.*

    *4)    Write assumptions wherever necessary.*

*Q1)* Following activities describe a simplified process model of Loan Accounting System of a Bank. Reserve Bank of India sends parameters such as Loan Limits, Interest Rates for different type of loans. Customers approach bank for loans and furnish all details. Bank scrutinizes the applications and either approves or disapproves the proposals. For approved proposals the new loan account is created and loan amount is debited on that loan account. Customer pays loan installments every month and upon such payments the account is credited and the transaction is recorded. The interest is computed every month by scanning all transactions (credits) during that month. Whenever the customer demands, Statement of Account is given. Interest Statement is given to General Manager from the Interest Register. New Loan Sanctioned Statement is generated every year and is submitted to RBI.

Prepare SRS (Scope, objective, function requirements, system specification) for the above system.                                                                                    **[20]**

*Q2)* Draw Decision Tree and Decision Table for the following case :        **[10]**

All the states in country have arranged to implement Value Added Tax (VAT) on the various commodities sold in their respective states. The VAT rules are as follows:

1.    If the commodity is product within the state 4% VAT is applicable.

2.    If commodity falls in Specified List. Non-listed Commodities will be charged 8% VAT.

3.    If the commodity is from outside state, 8% VAT is applicable for all.

*P.T.O.*

4. If the commodity is imported, then 12% VAT is applicable for all.

5. If it is second sale, the 4% VAT is applicable for all Commodities.

*Q3)* A RTO has laid down following procedure for obtaining Permanent Driving License for various noncommercial vehicles. A candidate for valid Learning License can submit his form and License test fees of his own or through Motor Driving School. The data on form is entered and exact date and time of driving test will be allocated to the candidate. The available Inspector will conduct Test and ask question related to traffic sine to the candidate. On the basis of test and answer, the concerned Inspector puts his remarks on the form and makes signature along with his name and designation. If the remark is PASSING, the candidate has to pay License Fees at a cash counter and a cash receipt will be given to candidate. Candidate can collect License after 3 days. The clerk at cash counter adds the test data, Fees data details to the form record. The form test data then is compiled by EDP officer, generates license and hands it over to counter clerk. A License will be given to candidate after the cash receipt.

A) Draw E-R Diagram [5]

B) Draw context DFD [5]

*Q4)* Compare Spiral Model and RAD Model. [10]

*Q5)* Explain the features of a modern GUI form with a suitable example. [10]

*Q6)* Explain method of estimating software maintenance cost. Give various components of legacy systems. [10]

*Q7)* Write short notes on (any 4) : [20]

a) Agile process.

b) Code Design.

c) Reverse engineering.

d) Prototype Model.

e) Case Tools.

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**[4775]-104**

## M.C.A. (Management Faculty) (Semester - I)
## BM - 11 - 104 : PRINCIPLES AND PRACTICES OF MANAGEMENT AND ORGANIZATIONAL BEHAVIOR
## (2012 & 2013 Pattern)

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*
1) *Question No. 1 is compulsory.*
2) *Attempt any 3 from the remaining.*
3) *Figures to the right indicate full marks.*

*Q1)* a) Define OB. Explain the different challenges in OB with reference to globalization & its impact on people management. **[15]**

   b) Describe the various decision making environment with example. **[10]**

*Q2)* What are the different ego states? Explain use of transactional analysis for conflict management. **[15**

*Q3)* Define Leadership & State its importance along with its styles. **[15]**

*Q4)* Discuss the contribution of 'Henry Fayol' for the field of management. **[15]**

*Q5)* Define 'Organization'. Also write in detail on Organization structures. **[15]**

*Q6)* Write short note (any 3) :                                          **[15]**

   a)   Principles of Bounded Rationality

   b)   Theory of X Vs Theory of Y.

   c)   Team building.

   d)   Planning.

   e)   JOHARI window.

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## [4775]-105

## M.C.A. (Management Faculty) (Semester - I)
## MT-11:150 DISCRETE MATHEMATICS
## (2012 & 2013 Pattern)

*Time : 3 Hours]*                                                                                          *[Max. Marks : 70*

*Instructions to the candidates:*
   *1)   Question No. 1 is compulsory.*
   *2)   Solve any two from Question number 2, 3 & 4.*
   *3)   Use of statistical table and non programmable calculator is allowed.*
   *4)   Figures to the right indicate full marks.*

*Q1)* Attempt the following :

   a)   Test the validity of the following argument :                                                    **[5]**

        $P_1 : \neg (A \wedge \neg B)$, $P_2 : \neg B \vee D$, $P_3 : \neg D$, $C: \neg A$

   b)   Let A = {1, 2, 3, 4} and R = {(1, 2,), (2, 1), (2, 3), (3, 4)}. Find R +
        (Transitive closure) by using Warshall's algorithm.                                              **[5]**

   c)   How many words, with or without meaning, can be formed out of the
        letters of the word 'CORRESPONDENCE'? How many if two R's should
        be together?                                                                                     **[5]**

   d)   Find the number of integer valued solutions of the following equation.**[5]**

        $x_1 + x_2 + x_3 = 33$            $x_1 > 4, x_2 \geq 6, x_3 > 4$

   e)   State and prove formula Derangement.                                                             **[5]**

   f)   Show that $(Z_7^*, \times_7)$ is an abelian group. Where $Z_7^*$ a set of all prime
        residue classes modulo 7 and $\times_7$ is multiplication modulo 7.                             **[5]**

*Q2)* Solve the following :

a) Obtain PCNF for the following : **[5]**

$(P \wedge Q) \vee (\neg P \wedge Q) \vee (P \wedge \neg Q)$

b) Let X ={1, 2, 3} and f,g and h be relations defined on X given by : **[7]**

$$f = \{(1, 2), (2, 3), (1, 1)\}$$

$$g = \{(1, 2), (2, 1), (3, 3)\}$$

$$h = \{(1, 1), (2, 2), (3, 1)\}$$

Determine which of the above relations are function, injective function and surjective function.

c) i) Find the coefficient of $x^4 y^9 z^4$ in the expansion of                          .

ii) Find the number of ways of seating m women and n men (m<n) at a round table so that no 2 women sit side by side.

**[8]**

*Q3)* Solve the following :

a) Indicate the variables that are free and bound. Also show the scope of the quantifiers in the following : **[5]**

$$\left( x \right) \left( \left( (y) \left( P(x,y) \wedge R(y) \right) \right) \wedge \left( (x) R(x) \right) \wedge Q(x) \right)$$

$$H = \begin{vmatrix} 1 & 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 0 & 1 \end{vmatrix}$$

i)

ii)

b) Write code words generated by H where : **[7]**

What is the minimum weight of the non-zero code word in the above code words? How many errors can the code generated by H detect?

c) i) Using combinatorial argument prove the following binomial identity. **[4]**

ii) A survey of 500 television viewers produces the following information: 285 watch cricket; 195 watch hockey; 115 watch tennis; 45 watch cricket and tennis; 70 watch cricket and hockey, 50 watch hockey and tennis; 50 do not watch any of the three games. **[4]** How many people in the survey watch all the 3 games?

*Q4)* Solve the following : **[5]**

a) Let X = {1, 2, 3, 4, 5} and R : X → *X* be defined as :

R = {(1, 4), (2, 3), (2, 4), (3, 5), (4, 1), (5, 2), (4, 5) (5, 1)} find :

i) Converse of relation R.

ii) Relation matrix.

iii) Graph of relation. $\left(\forall a, b \in G\right)\left(a * b\right)^2 = a^2 * b^2$ $\binom{n}{r} + \binom{n}{r-1} = \binom{n+1}{r}$

b) Test the validity of the following argument : **[7]**

If Tina marries Rahul, she will be in Pune. In Tina marries Ganesh, she will be in Mumbai. If she is either in Pune or Mumbai, she will definitely be settled in life. She is not settled in life. Thus she did not marry Rahul or Ganesh.

c) i) There are six questions in the paper of Discrete Mathematics, how many ways are there to assign marks to each problem if the sum of the marks is 70 and each question is worth at least 10 marks? (No question carries fractional marks). **[8]**

ii) Show that in a group (G,*), if for any
then G is an abelian group.

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**[4775] - 201**

## M.C.A. (Management Faculty) (Semester - II)
## IT - 21 : OBJECT ORIENTED PROGRAMMING WITH C++
## (2013 Pattern)

*Time : 3 Hours]*          *[Max. Marks : 70*

*Instructions to the candidates:*

    *1)*    *Question 1 is compulsory.*

    *2)*    *Answer any six questions from remaining questions.*

    *3)*    *Figures to the right indicate full marks.*

*Q1)* A)   What will be the output of following program?       **[10]**

```
# include < iostream.h>
# define SQUARE(x) x*x
inline float square(float y)
{
    return y*y;
}
int main()
{
    float a = 0.5, b = 0.5, c, d;
    c = SQUARE(++a);
    d = square(++b);

    cout <<c <<endl <<d;

    return 0;
}
```

B) Const int size = 5;

```cpp
void print (int * ptr) {

cout << ptr [0];

}

void print (int ptr [ ]){

cout << ptr [0];

}

void main ()

{

int a [size] = {1,2, 3,4, 5};

int *b = new int (size);

print (a);

print (b);

}
```

C)
```cpp
int & fun ()

{

    static int a = 10;

return a;

}

int main ()

{

    int & y = fun ();

    y = y+30;

    cout << fun ();

    return 0;

}
```

D) 
```
#include<iostream.h>
void execute (int x, int y = 200)
{
    int temp = x + y;
    x + = temp;
    if(y! = 200)
        cout  <<temp<<x<<y<<endl;
}
void main()
{
    int a = 50, b = 20;
    execute(b);
    cout<<a<<b<<endl;
    execute(a, b);
    cout<<a<<b<<endl;
}
```

E) 
```
#include<conio.h>
#include<iostream.h>
#include<iomanip.h>
void main()
{
    int x=100;
    float f=56.75;
    cout<<hex<<x<<dec<<x<<endl;
    cout<<setw(8)<<setfill('0')<<f
}
```

*Q2)* A) Explain static member function and static data member. **[5]**

B) Write a program to demonstrate copy constructor. **[5]**

*Q3)* A) What is the need of virtual base classes? Give an example to illustrate the need for virtual base class. **[5]**

B) What is name conflict problem? How can it be solved using namespaces? **[5]**

*Q4)* Explain different types of inheritance with suitable examples of each type.**[10]**

*Q5)* A) Write a program to overload '+' operator to concatenate two strings.**[5]**

B) Write a program to read text file and count number of characters in it. **[5]**

*Q6)* A) Write a program to demonstrate default arguments and constant arguments for a function. **[5]**

B) Draw a comparison between different casting operators. **[5]**

*Q7)* A company has following details of their employees in the file 'emp.dat". **[10]**

a) Emp ID

b) Emp Name

c) Emp Address

d) Emp Dept (Admin/Sales/Production/IT)

e) Emp phone

f) Emp Age

Write a program to read the above file. Create new files such as Adm.dat, Sal.dat, Pro.dat, IT.dat respectively, to store the employee details according to their department.

*Q8)* Write short notes on (any two) : **[10]**

A) Virtual Destructors

B) Friend function and Friend Class

C) Exception Handling Mechanism

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**[4775] - 202**

## M.C.A. (Semester - II) (Management Faculty)
### IT - 22 : DATABASE MANAGEMENT SYSTEM
### (2012-13 Pattern)

*Time : 3 Hours]*                                                      *[Max. Marks : 70*

*Instructions to the candidates:*
  1) *Q. No. 1 and 6 are compulsory.*
  2) *Solve any three questions from remaining.*
  3) *State asumption wherever necessary.*

**Q1)** Global computer institute conduct various short term Diploma courses. Each diploma course has various subjects. One faculty can teach more than one subject and one subject can be tought by more than the faculty. There are three Batches of morning. Afternoon and Evening. Student can opt for any one batch. The students can pay the fees of the course in 2 installments. Represent the above can study through an ER diagram and normalized (3NF) file layout.                                                        **[20]**

**Q2)** Define characteristics of DBMS. Explain Database Users.        **[10]**

**Q3)** Explain two phase locking techniques in concurrency control.   **[10]**

**Q4)** Explain Log-band recovery technique in detail                  **[10]**

**Q5)** Write SQL statement for the following (any 5)                  **[10]**

  a)  Supplier (Sup-no, sup-name, city, states)

  b)  Part (part - no, part-name, weight, colour, price)

  c)  Shipment (sup-no, part-no, qty).

      sup-no and part-no are primary keys.

      i)   find the entire supplier who supplies "SCREW"

      ii)  Display the total no. of suppliers from each city.

iii) Display the supplier name, part name with quantity more than 100.

iv) Delete the supplier from city 'Pune' and status is 10

v) Change the status for Mumbai as 20

vi) Find the total weight and total price for all parts.


*Q6)* Write short notes on (any four) [20]

a) E.F. Codd's rules any five

b) Non-SQL database

c) Mandatory access

d) File Organization

e) Generalization


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## [4775] - 203
## M.C.A. (Management Faculty) (Semester - II)
## I T - 23 : OPERATING SYSTEM CONCEPTS
## (2012-13 Pattern)

)*Time : 3 Hours]* *[Max. Marks : 70*

***Instructions to the candidates:***
1) *Question 1 and 7 are compulsory.*
2) *Solve any 4 (four) from remaining.*
3) *Make suitable assumptions & Draw neat diagrams if required.*

*Q1)* a) Explain the concept of paging with example. **[10]**

b) What is difference between contiguous and Non Contiguous memory allocation? **[5]**

*Q2)* Explain Different types of Disk scheduling algorithms with suitable examples.**[10]**

*Q3)* Explain file structure and directory structure. **[10]**

*Q4)* What do you mean by process synchronization? Explain critical section problem. **[10]**

*Q5)* Explain preemptive and non-preemptive CPU scheduling algorithms. **[10]**

*Q6)* Explain SCAN and C-SCAN algorithms for disk scheduling. **[10]**

*Q7)* Write short note on (any 3) **[15]**
a) Virtual Machine
b) Process Control Block
c) Centralized OS Vs Distributed OS
d) Features of Android OS

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**[4775] - 204**

# M.C.A. (Management Faculty) (Semester - II)

## BM - 21 : 204 - Management Information System and Business Intelligence
## (2012 Pattern)

)*Time : 3 Hours]*                                                                    *[Max. Marks : 70*

***Instructions to the candidates:***
1) *Q. 7. is compulsory.*
2) *Solve any five questions from Q. 1 to Q. 6.*

*Q1)* Draw and explain B. I. Architecture. Enlist BI Application in various domains.                                                                         **[10]**

*Q2)* What is system. Explain types of systems. Also explain how feedback control is important within the system. Give suitable example.                    **[10]**

*Q3)* Define M.I.S. Explain the structure of MIS based on Management functions.**[10]**

*Q4)* What is BI Analytics. Explain discriminant and logistic regression method with suitable example                                                      **[10]**

*Q5)* Define D.S.S. Explain characteristics & capabilities of DSS                   **[10]**

*Q6)* Explain the Herbet - Simon model with example.                                **[10]**

*Q7)* Write short notes on (any four)                                        **[4 × 5 = 20]**
    a) EIS Vs DSS Vs MIS
    b) Expert system Vs conventional system
    c) Data Mart & Data warehouse
    d) Law of requisite variety.
    e) Sensitity Analysis

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**[4775] - 205**

# M.C.A. (management faculty) (Semester - II)
## IT - 24 : ENTERPRISE RESOURCE PLANNING
## (2012 & 2013 Pattern)

ʾ*Time : 3 Hours]*

*[Max. Marks : 70*

***Instructions to the candidates:***

    *1)*   *Que. 1. is compulsory.*

    *2)*   *Attempt any 5 Questions from Q. 2 to Q. 7.*

**Q1)** Answer the following questions                        **[20]**

    a)   What is use of ERP in the large scale IT organization.

    b)   Arya school is international school having 300 branches all over India. They have implemented the Educational ERP software for their over all functions & operations.

           You as an IT Expert needs to justify why ERP is useful in Educational system.

**Q2)** Define ERP Implementation Life cycle in detail with example.   **[10]**

**Q3)** Explain standardization of data code & Benefits of Integration.   **[10]**

**Q4)** What is Business Process Re-Engineering Give one Example of the same.**[10]**

**Q5)** How Data warehousing & Data mining is useful in today's business world **10]**

**Q6)** Define functions of Human Resource management & production planning management                                        **[10]**

**Q7)** Write short notes on (any two)                           **[10]**

    a)   OLAP

    b)   CRM

    c)   SCM

    d)   Quality Management

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**[4775] - 301**

# M.C.A. (Management Faculty) (Semester - III)
## IT - 31 : WEB TECHNOLOGIES
## (2012 & 2013 Pattern)

)*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*
  *1)   Q. 1 is compulsory.*
  *2)   Solve any five from Q. 2 to Q. 7.*
  *3)   Draw neat diagrms wherever necessary.*

*Q1)* Write DTD file for validating the information of students and apply the following **[20]**

  a)   Create XML file using DTD file

  b)   Convert XML file into HTML format with header and footer.

  c)   Apply external CSS file to XML file.

  (Alternative element data should be in different color)

  (Assume your own structure for writing DTD file)

*Q2)* Design HTML form for creating bank account and apply external CSS which includes font, margin and border styles. **[10]**

*Q3)* Explain History and Navigator objects in JavaScript with examples. **[10]**

*Q4)* Explain chaining, Gatters and setters in Jquery with examples. **[10]**

*Q5)* Explain Authentication in Apache web server. **[10]**

*Q6)* Explain event handing in JavaScript with examples. **[10]**

*Q7)* Write short notes on (any two)                                    **[10]**

    a)   Ajax methods

    b)   SSL certificate

    c)   DOM in JavaScript

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## [4775]-302

## M.C.A. (Management Faculty) (Semester - III)

## IT -32 - 302 : DATA COMMUNICATION AND COMPUTER NETWORKS

## (2012 & 2013 Pattern)

*Time : 3 Hours]*                                                     *[Max. Marks : 70*

*Instructions to the candidates:*
  1) *Q.1 and Q.7 are compulsory.*
  2) *Attempt any Three from remaining.*
  3) *Neat diagrams must be drawn wherever necessary.*
  4) *Figures to the right side indicate full marks.*

*Q1)* a)  Justify with True or False (not more than 60 words).          **[10]**

  i)  In OSI network Architecture the dialogue Control and Token Management are responsibilities of Session Layer.

  ii)  To connect LAN's with different protocols a translating bridge can be used.

  iii)  Firewalls operate in one of two filtering modes: Deny all or pass all.

  iv)  RIP is a dynamic distance vector method based on Hop counts.

  v)  Sequencing is provided in virtual circuit approach, since all packets follow the different route.

  b)  The received Hamming code word is **101101010**. Using odd parity locates and corrects the bit in error.                              **[10]**

*Q2)* a)  Find the maximum number of hosts available on a class-B address with a subnet mask of 255.2555.255.192.                              **[5]**

  b)  Find the subnet ID for the IP address 202.127.19.94 with a subnet mask of  255.255.255.248.                                          **[5]**

*Q3)* What is HTTP? What are the different types of HTTP Request? Explain any five of them. **[10]**

*Q4)* Why DHCP? Explain the addressing schemes in DHCP. List the characteristics of DHCP. **[10]**

*Q5)* Explain Open Shortest Path First routing protocol. Why it is efficient? **[10]**

*Q6)* Define threat and attacks. Explain active attack and passive attack. Why Digital Signature is used? **[10]**

*Q7)* Write short notes (any Four) : **[20]**

    a)   Wi-Max

    b)   Topologies

    c)   IP-Routing

    d)   Packet format of IPv4.

    e)   SMTP

    f)   P2P Protocol

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## [4775]-303

## M.C.A. (Management Faculty) (Semester - III)
## IT - 33 : Data Structure Using C++
## (2012 Pattern)

*Time : 3 Hours]*                                                                                      *[Max. Marks : 70*

*Instructions to the candidates:*
1) *Questions 1 is compulsory.*
2) *Solve any four questions from Q. 2 to Q. 7.*

*Q1)* Write short note on any two :                                                                  **[10]**

a)    Generalized Linked List

b)    B⁺ Tree

c)    Queue empty and full condition of a circular queue.

*Q2)* a)    A graph is implemented by adjacency matrix Write a non-recursive
          algorithm for depth first search.                                              **[7]**

b)    Write a C++ code for circular queue with insert, delete & display function.
                                                                                                                       **[8]**

*Q3)* a)    Write a C++ code for addition of two polynomials.                 **[7]**

b)    Convert prefix to postfix form and show contents of stack at each step.**[8]**

*+a-bc/-de+-fgh

*Q4)* a)    Write a program to evaluate postfix expression.                    **[7]**

b)    Write C++ code for insertion & deletion of elements in a queue.    **[8]**

*P.T.O.*

*Q5)* a)   Write a function for Right-Left rotation.                                **[7]**

b)   Draw AVL tree for following:                                             **[8]**

40,20,10,50,90,30,60,70,95


*Q6)* a)   Write a function to insert node in threaded binary tree.             **[7]**

b)   Draw a binary search tree for following. Also write preorder traversal for this.                                                              **[8]**

23,89,34,67,99,2,55,45,78,12,56


*Q7)* a)   Write a program to implement priority queue using Link list.         **[7]**

b)   Write a function to insert an element in B tree.                         **[8]**


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**[4775]-304**

**M.C.A. (Management Faculty) (Semester - III)**

**IT - 34 : Advanced Database Management System**

**(2013 Pattern)**

*Time : 3 Hours]*                                           *[Max. Marks : 70*

*Instructions to the candidates:*

1) *Question No. 1 is compulsory.*
2) *Solve any five questions from Q. 2 to Q. 7.*
3) *Figures to the right indicate full marks.*

*Q1)* a)  Compare RDBMS, OODBMS and ORDBMS in detail.          **[10]**

b)  Explain the operations of OLAP.                          **[10]**

*Q2)* Explain Inter - operational and Intra-operational parallelism with relevant examples.          **[10]**

*Q3)* Explain 2PC protocols. Discuss its failure & recovery techniques.          **[10]**

*Q4)* Describe classification. Explain any two classification algorithms with examples.          **[10]**

*Q5)* What are the various applications of XML? Elucidate the difference between DTD & XML schema.          **[10]**

*Q6)* Explain multimedia architecture. Mention the requirements for mobile databases.          **[10]**

*Q7)* Write short notes on (any two) :                                    [2 × 5 = 10]

    a)   N-tier architecture

    b)   SOAP

    c)   Text mining

    d)   Snowflake Schema

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**[4775]-305**

## M.C.A. (Management Faculty) (Semester - III)
## IT - 35 : OBJECT ORIENTED ANALYSIS AND DESIGN
## (2012 Pattern)

*Time : 3 Hours]*                                                                                    *[Max. Marks : 70*

***Instructions to the candidates:***

    *1)   **Question No. 1 and 7 is compulsory.***

    *2)   **Solve any four from the remaining.***

    *3)   **Mention assumptions for solving case studies.***

**Q1)** Disha is a Vehicle Inspection Centre. The centre carries out the inspection process as follows:

Customer arrives at the centre with his vehicle and stand in a queue. The data of vehicles are recorded when they come for initial inspection and the registration number is allocated to them. For the next inspection customer has to provide his registration number. The clerk searches the vehicle information with the help of the registration number. Actual inspection is performed and the vehicle data is updated. The future appointment data is generated by the clerk for vehicle inspection. The clerk has to maintain the dates for which bookings for inspection are full and should also consider the holidays on which the centre is closed.

    a)   Draw Use Case diagram.                                  **[10]**

    b)   Class diagram.                                                  **[10]**

**Q2)** Draw the State Transition Diagram for a petrol station where on arrival for filling gas, attendants can perform two task in parallel, filling petrol as well as washing windshield.          **[10]**

**Q3)** a)   Draw a Sequence diagram for sending friend request on Facebook Make suitable assumption.                     **[5]**

    b)   Differentiate between aggregation and composition.        **[5]**

*Q4)* MCA admission procedure is as followed :                                    **[10]**

    a)    DTE advertises the date of MCA entrance examination.

    b)    Student has to apply for the entrance examination.

    c)    Results are declared by DTE.

    d)    Students has to fill up option form to select the college of his/her choice.

    e)    DTE displays the allotment list in the website and intimation to all colleges.

    f)    Students should report the allotted colleges and complete the admission procedure. Draw Activity Diagram.

*Q5)* Compare Grady Booch Methodology with OMT.                                    **[10]**

*Q6)* Explain four major approaches of Rational unified Process.                   **[10]**

*Q7)* Write short notes on any two :                                              **[10]**

    a)    CRC approach

    b)    Benefits of Pattern

    c)    Testing Strategies

    d)    Multiple Inheritance

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**[4775]-401**

# M.C.A. (Management Faculty) (Semester - IV)
## IT - 41 : JAVA PROGRAMMING (New)
## (2012 Pattern)

*Time : 3 Hours]*                                                              *[Max. Marks : 70*

*Instructions to the candidates:*
   *1)   Question No. 1 is compulsory.*
   *2)   Solve any six from the remaining.*

*Q1)* Solve the following questions :                                           **[10]**

   a)   Explain finalize ()

   b)   List out four methods of Enumeration Interface.

   c)   Explain difference between Static & Member Method.

   d)   What is object serialization.

   e)   What is URL?

*Q2)* Write GUI based JDBC application for candidate registration. Assume suitable table structure.                                                        **[10]**

*Q3)* Write Java application to demonstrate add, replace delete, copy node in Hashset.                                                                    **[10]**

*Q4)* Write a Java socket program to accept file name at client side, and server accepts file name and sends no. of words in the file or indicate that the file doesn't exist.                                                              **[10]**

*Q5)* Write an applet to display scrolling text from right to left in an applet window.                                                                     **[10]**

*Q6)* Explain RMI architecture and write RMI application to check whether entered No. is palindrom No. of Not. **[10]**

*Q7)* What is exception? Explain types of exceptions with example. **[10]**

*Q8)* Write notes (any two) : **[10]**

    a)     Beans persistence

    b)     Layout managers

    c)     Thread life cycle

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**[4775] - 402**

# M.C.A. (Management Faculty) (Semester - IV)
## IT - 42 : MOBILE COMPUTING
### (2012 Pattern)

*Time : 3 Hours]*                                             *[Maximum Marks : 70*

*Instructions to the candidates:*
1) *Q.1 is compulsory.*
2) *Solve any 5 from the remaining.*

*Q1)* a)   What are cellular systems? Explain the main reasons for using cellular systems.**[5]**

   b)   What is Mobile IP? Explain the various components of Mobile IP. **[10]**

   c)   What is handover? Explain the reasons why handover is needed in GSM.**[5]**

*Q2)* What is Android? Explain the Architecture and Features of Android.     **[10]**

*Q3)* What is database hoarding? Explain the various caching Invalidation mechanism.**[10]**

*Q4)* Explain the various file system in Android.                           **[10]**

*Q5)* Write an Android Program to demonstrate TIP calculator.               **[10]**

*Q6)* What is G+ Talk? Explain the various Techniques for managing chat sessions.**[10]**

*Q7)* Write short notes on (Any Two)                                        **[10]**
   a)   GPRS
   b)   Palm O.S.
   c)   Map based Activities.

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**[4775] - 403**

# M.C.A. (Management Faculty) (Semester - IV)
## IT - 43 : Information Security and Audit
### (2012 Pattern)

*Time : 3 Hours]*

*[Maximum Marks : 70*

*Instructions to the candidates:*
1) *Q.1 and Q.7 are compulsory.*
2) *Solve any four from Q.2 to Q.6.*
3) *Figures to the right side indicate full marks.*

*Q1)* A person buying gadgets through online shopping comes across a popup window with a discount offer and requested to share bank account details. Discuss security related issues. **[10]**

*Q2)* What are the components of ISMS and explain conceptual framework. **[10]**

*Q3)* Explain the threats of information security. **[10]**

*Q4)* Which are the different types of information security policies. **[10]**

*Q5)* Explain COBIT framework in detail. **[10]**

*Q6)* Explain logical and physical access control. **[10]**

*Q7)* Short notes on (any Four) **[4 × 5 = 20]**
   a) NGS auditor
   b) Internet access security
   c) BCP and DRP
   d) Ethical hacking
   e) Audit standards

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**[4775] - 404**

## M.C.A. (Management Faculty) (Semester - IV)
## IT - 44 : Design and Analysis of Algorithms
### (2012 & 2013 Pattern)

*Time : 3 Hours]*          *[Maximum Marks : 70*

*Instructions to the candidates:*

1) *Question 1 and 8 are compulsory.*
2) *Solve any five questions from Q.2 to Q.7.*
3) *Figures to the right indicate full marks.*

*Q1)* a) What is an algorithm? State different characteristics of good algorithm. **[5]**

b) Differentiate between the Greedy and Dynamic approach of the problem solving.**[5]**

*Q2)* Design an algorithm for fractional knapsack problem using greedy method. Trace it with suitable example. **[10]**

*Q3)* What are the characteristics of divide and conquer method? Discuss Quick sort algorithm with its complexity. Assume suitable data. **[10]**

*Q4)* Write an algorithm for multistage graph using dynamic programming technique.**[10]**

*Q5)* Write and analyze the recursive Tower of Hanoi algorithm with n = 3. **[10]**

*Q6)* Discuss 0/1 Knapsack problem using branch and bound technique and write the algorithm for same. **[10]**

*Q7)* Explain the term heap. State the types of heap and write a heap sort algorithm for max - heap. **[10]**

*Q8)* Write short note on any two of the following : **[10]**

a) Asymptotic Notations.

b) Graph Coloring

c) NP complete and NP Hard Problems.

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**[4775] - 405**

## M.C.A. (Faculty of Management) (Semester - IV)
## MT - 41 : OPTIMIZATION TECHNIQUES
### (2012 Pattern)

*Time : 3 Hours]*                                                    *[Maximum Marks : 70*

***Instructions to the candidates:***

*1)   Question No. 1 is compulsory.*

*2)   Attempt any Three from the remaining.*

*3)   Use of non programmable calculators is allowed.*

*4)   Figures to the right indicate full marks.*

**Q1)** a)   Solve the Transportation Problem                                      **[7]**

Destinations

| | | $D_1$ | $D_2$ | $D_3$ | $D_4$ | Supply |
|---|---|---|---|---|---|---|
| Origins | $O_1$ | 40 | 25 | 33 | 22 | 100 |
| | $O_2$ | 44 | 35 | 30 | 30 | 30 |
| | $O_3$ | 38 | 38 | 30 | 28 | 70 |
| | Demand | 40 | 20 | 30 | 50 | |

b)   The following information regarding a project is given            **[7]**

| Activity | Immediate Predecessor | Time in days | | |
|---|---|---|---|---|
| | | Most Optimistic | Most Likely | Most Pessimistic |
| A | - | 4 | 6 | 8 |
| B | A | 5 | 7 | 15 |
| C | A | 4 | 8 | 12 |
| D | B | 15 | 20 | 25 |
| E | B | 10 | 18 | 26 |
| F | C | 8 | 9 | 16 |
| G | E | 4 | 8 | 12 |
| H | D,F | 1 | 2 | 3 |
| I | G , H | 6 | 7 | 8 |

i)    Construct an arrow diagram for this problem.

ii)   Determine the critical path and compute the expected completion time.

iii)  Determine the probability of completing the project in 55 days.

*P.T.O.*

c)  In a bank with a single cashier, customer arrives on an average every 10 minutes. The cashier takes 5 minutes to attend a customer. Find : **[7]**

  i)   The average number of customers waiting for the cashier.

  ii)  The average time spend by a customer in the bank.

  iii) The probability that there will be 5 customers in the bank at any point of time.

d)  There are seven jobs, each of which has to be processed on machine A and then on Machine B. Processing time is given in hours. Find the optimal sequence in which the jobs are to be processed so as to minimize the total time elapsed. **[7]**

| Jobs | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|------|---|---|---|---|---|---|---|
| Machine A | 3 | 12 | 15 | 6 | 10 | 11 | 9 |
| Machine B | 8 | 10 | 10 | 6 | 12 | 1 | 3 |

*Q2)* a)  Solve the following LPP by Dual Simplex Method. **[7]**
Min : $Z = 36x_1 + 60x_2 + 45x_3$

Subject to :

$$x_1 + 2x_2 + 2x_3 \geq 40$$
$$x_1 + x_2 + 5x_3 \geq 25$$
$$x_1 + 4x_2 + x_3 \geq 50$$
$$x_1, x_2, x_3 \geq 0$$

b)  A firm is thinking of replacing a particular machine whose cost price is Rs. 12,200. The scrap value of the machine is Rs. 200/-. The maintenance costs are found to be as **[7]**

| Year | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------|---|---|---|---|---|---|---|---|
| Maintenance Cost in Rs. | 220 | 500 | 800 | 1200 | 1800 | 2500 | 3200 | 4000 |

Determine when the firm should get the machine replaced.

*Q3)* a)  The demand for an item is 3000 units per annum. The cost of one procurement is Rs. 100 and the holding cost per unit is Rs. 2.40 per year. The replenishment is instantaneous and no shortages are allowed. Determine **[7]**

  i)   Economic order quantity

  ii)  Number of order per years

  iii) The time between the orders.

**b)** A small garment making unit has five tailors stitching five different types of garments. All the five tailors are capable of stitching all the five types of garments. The output per day per tailor for each type of garment is given below : **[7]**

Garments

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| A | 7 | 9 | 4 | 8 | 6 |
| B | 4 | 9 | 5 | 7 | 8 |
| C | 8 | 5 | 2 | 9 | 8 |
| D | 6 | 5 | 8 | 10 | 10 |
| E | 7 | 8 | 10 | 9 | 9 |

(Tailors)

Determine which type of garment should be assigned to which tailor in order to optimize production?

**Q4) a)** Define : **[7]**
  i)   Gradual Failure of Machines
  ii)  Optimum Lot Size
  iii) Critical Path
  iv)  Dummy Activity
  v)   Pessimistic Time
  vi)  Activity
  vii) Total Float

**b)** Solve the following using Dual Simplex Method. **[7]**

Minimize $Z = x_1 + x_2$ subject to

$2x_1 + x_2 \geq 2$

$-x_1 - x_2 \geq 1$

$x_1, x_2 \geq 0$

**Q5) a)** A small project has the following activities, duration (in weeks) and associated cost. Draw the network diagram, find the normal duration and normal cost. Also systematically crash the activities to find the optimum cost. Indirect cost is Rs. 1000 per week. **[7]**

| Activity | Preceding Activity | Normal | | Crash | |
|---|---|---|---|---|---|
| | | Time | Cost | Time | cost |
| A | - | 5 | 25000 | 2 | 34000 |
| B | - | 4 | 30000 | 2 | 40000 |
| C | A | 10 | 45000 | 6 | 81000 |
| D | A | 5 | 30000 | 3 | 38000 |
| E | B | 7 | 30000 | 6 | 37000 |
| F | C, D | 5 | 20000 | 3 | 26000 |
| G | E, F | 4 | 35000 | 2 | 44000 |
| H | F | 6 | 35000 | 3 | 65000 |

b) In a departmental store one cashier is there to serve the customers. And the customers pick up their needs by themselves. The arrival rate is 20 customers per hour and the cashier can serve 24 customers per hour. Assuming Poisson arrival rate and exponential distribution for service rate, **[7]**

i) Average number of customers in the system.

ii) Average time a customer spends in the system.

iii) Average time a customer spends in the queue.

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**[4775] - 501**

# M.C.A. (Management Faculty) (Semester - V)
## (IT - 51) : Software Testing & Quality Assurance
### (2012 Pattern)

*Time : 3 Hours]*           *[Maximum Marks : 70*

*Instructions to the candidates:*
   *1)*    *Question 1 & 6 are compulsory.*
   *2)*    *Solve any 3 from the remaining.*

*Q1)* Write a detailed test plan for a mobile Application "Movie - Masti" to book online movie tickets. Also write test case for this movie ticket booking system. Also write about test document & test strategies.   **[20]**

*Q2)* Explain path, statement, branch and decision coverage in structural testing. Give examples for each.   **[10]**

*Q3)* a)   Calculate cyclomatic complexity for checking even/odd number.   **[5]**
     b)   Compare Alpha Vs Beta Testing   **[5]**

*Q4)* Explain software reliability models and measures in detail.   **[10]**

*Q5)* Explain different types of reviews with suitable examples?   **[10]**

*Q6)* Write short notes on following :(any 4)   **[4 × 5 = 20]**
     a)   Equivalence partitioning.
     b)   Tester's workbench
     c)   Black box Vs white box testing.
     d)   CMM
     e)   Web based Application Testing.

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**P1878**

**[4775] - 503**
# MCA (Semester - V)
## MANAGEMENT FACULTY
## IT - 53 : Emerging Trends in Information Technology
### (2012 Pattern)

*Time : 3 Hours]*　　　　　　　　　　　　　　　　　*[Maximum Marks : 70*

*Instructions to the candidates:*

　　*1)　Question No. 1 & Question 7 are compulsory.*

　　*2)　Solve any four from Questions from the remaining.*

　　*3)　Figures to the right indicate full marks.*

*Q1)* A deemed university want to implement e - learning model for distance learning programs. As an IT consultant do comparative analysis of various e - learning models and suggest suitable e - learning model to university also justify your suggestion.**[15]**

*Q2)* Explain advantages & disadvantages of cloud computing.　　　　**[10]**

*Q3)* Explain different types of social networking sites.　　　　　　**[10]**

*Q4)* Explain various electronic payment methods. How transactions are performed in E - banking.

*Q5)* Explain telemonitoring and E - coaching.　　　　　　　　　　**[10]**

*Q6)* Explain E - commerece architecture.　　　　　　　　　　　　**[10]**

*Q7)* Write A short Note (Any 3) :　　　　　　　　　　　　　　　**[15]**

　　a)　Features and need of social networking.

　　b)　Meeting Tools.

　　c)　Cloud computing models

　　d)　POS

　　e)　Applications of m - commerce.

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**[4775] - 504**

# M.C.A. (Management Faculty) (Semester - V)
# IT - 54 : Advanced Development Technology
## (2012 Pattern)

*Time : 3 Hours]*             *[Maximum Marks : 70*

*Instructions to the candidates:*
    *1)*   *Q.No. 1 is compulsory.*
    *2)*   *Solve any Four questions from Q.No. 2 to Q.No. 7.*
    *3)*   *Figures to the right indicates full marks.*

*Q1)* Explain ASP. Net server side state management techniques in detail.    **[10]**

*Q2)* Explain various login controls in detail.    **[15]**

*Q3)* Explain the concept of error pages and error logging with the help of suitable example.    **[15]**

*Q4)* Design a form and write code to :    **[15]**
    a)    Populate and display student's name in a drop down list.
    b)    Select a student from DDL and display its details in underlying text boxes.
    c)    Add a record.
    d)    Delete selected record.
    e)    Edit selected record.

Name of table : Studentmaster (StudID, StudName, DOB, percentage, coursename)
Name of server : MYASPDB (SQL Server)

*Q5)* a)    Write a code and steps to create and consume web service.    **[10]**
    b)    Explain the advantages and disadvantages of client side state management technique.    **[5]**

*Q6)* Explain uses, properties and methods of following controls (Any Three)**[15]**

    a)    Gridview control.

    b)    Drop downlist control.

    c)    File upload control

    d)    Check Box control

*Q7)* Write short notes on following (Any Three)                **[15]**

    a)    Compare Validator control.

    b)    Menu Navigation control

    c)    Ajax control

    d)    Exception handling

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**[4775] - 505**

# M.C.A. (Management Faculty) (Semester - V)
# IT - 55 : ADVANCED INTERNET TECHNOLOGY
## (2012 Pattern)

*Time : 3 Hours]*      *[Maximum Marks : 70*

*Instructions to the candidates:*

*1)*    *Question 1 & 7 are compulsory.*

*2)*    *Answer any Four questions from remaining (Q2 - Q6)*

*3)*    *Neat diagrams must be drawn wherever necessary.*

*4)*    *Figures to the right side indicate full marks.*

*Q1)* a)    What is JSP? Explain JSP elements with example.    **[10]**

     b)    Explain SESSION and COOKIE in PHP.    **[5]**

*Q2)* Explain CGI architecture. Write a perl program to create a file, insert into that file and display the contents into that file.    **[10]**

*Q3)* Explain Http Servlet Request and Http Servlet Response with suitable examples.    **[10]**

*Q4)* What is ORM and Hibernate? What are the levels of ORM?    **[10]**

*Q5)* Design html page to display list of available books in a list box. Allow user to select multiple books & submit form. Write Servlet code to display selected book.    **[10]**

*Q6)* Write PHP code to accept Passport registration information from the customer, store it into the database and display the customer information.    **[10]**

*Q7)* Write short notes on (Any 3)    **[15]**

     a)    Servlet life cycle

     b)    Arrays in PHP

     c)    JSP directives

     d)    Perl array functions

     e)    Aspects which can affect the performance of Tomcat server.

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