P1241   **[3766] - 105**

M.C.A. (Engg. - I)
MANAGEMENT SCIENCE
(Sem. - I) (2008 Course)

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

Instructions to the candidates :

   1)   *Answer any 3 questions from each section.*

   2)   *Answers to the two sections should be written in separate books.*

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

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

   5)   *Your answers will be valued as a whole.*

   6)   *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*

   7)   *Assume suitable data, if necessary.*

SECTION - I

Unit - I

Q1) a)   Discuss contribution of F.W. Taylor to the development of Management.

                                                                        [6]

     b)   What are the different levels of Management.   **[6]**

<div align="center">OR</div>

Q2) a)   Define planning. Explain different steps involved in planning.   **[6]**

     b)   What are the different objectives of MBO?   **[6]**

Unit - II

Q3) a)   Explain the concept, characteristics of wants? Classify the different wants?   **[6]**

     b)   Explain E - Business Management.   **[6]**

<div align="center">OR</div>

Q4) a)   What are internal and external economics of scale?   **[6]**

     b)   What are major applications of ERP.   **[6]**

Unit - III

Q5) a)   What are different types of co-operative sectors?   **[6]**

     b)   How forms of business organisations are classified? Explain partnership in brief.   **[5]**

<div align="center">OR</div>

Q6) a) Explain public sector undertaking in brief. **[6]**

b) Explain advantages of informal organization. **[5]**

SECTION - II

Unit - IV

Q7) a) Explain Traditional and modern theories of motivation. **[6]**

b) Explain what preparations are required for personal Interview? **[6]**

OR

Q8) a) What do you understand by time Management? **[6]**

b) What is communication? Explain different types of communication.**[6]**

Unit - V

Q9) a) Explain Industrial Act in brief. **[6]**

b) What are the control methods used for water pollution? **[6]**

OR

*Q10)*a) Explain different labour laws in industries. **[6]**

b) Explain safety precautions taken in industries. **[6]**

Unit - VI

*Q11)*a) Explain concept of QC - Quality Circle in brief. **[6]**

b) What are the objectives of TQM? **[5]**

OR

*Q12)*a) What is Copyright Act? Explain. **[6]**

b) What are the advantages of ISO 9000 implementation? **[5]**

P1229   **[3766] - 15**

M.C.A. (Engineering)
MANAGEMENT SCIENCE
(Sem. - I) (2005 Pattern)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates :

1) *Maximum marks for the questions are given on the write hand side.*
2) *Answers to two sections should be written separately.*
3) *Answer any three questions from each section.*
4) *Assume suitable data wherever necessary.*

SECTION - I

Q1) a) Mention the benefits of implementing 'Management by Objectives'. Explain the steps involved in implementing this technique. **[8]**

    b) Do you feel that the Taylor's theory of Management is still valid? Justify. **[8]**

Q2) Solve **any three**-

    a) Explain special aspects of Human Needs with suitable examples. **[6]**

    b) Discuss the Law of Demand. Is it applicable universally? Justify. **[6]**

    c) What is the difference between E-commerce and E-governance? **[6]**

    d) What is the difference between Patent and Trade Mark? **[6]**

Q3) a) Compare the Public sector undertakings & Private sector undertakings, considering the share holding, management, strengths and weaknesses.**[8]**

    b) How does the Co-operative sector contribute to the national well-being? **[8]**

Q4) a) Differentiate between Cost, Price and Value. **[6]**

    b) Discuss the functions of Chambers of Commerce and Industries. **[6]**

    c) What are the benefits and limitations for Proprietorship Organization?**[4]**

SECTION - II

Q5) a) Discuss in brief the differences between Job Evaluation and Merit Rating.
[6]

b) Explain - Maslow's theory of need hierarchy. **[6]**

c) What do you understand from McGregor's 'theory X' and 'theory Y'?**[6]**

Q6) a) Explain in brief the purpose of enactment of the Factories Act, 1948. In your opinion has it been satisfied? Justify. **[8]**

b) What is meant by the term 'factory' as per the Factories Act, 1948? How does the Factories Act, 1948 helps in minimizing chances of accidents in a factory? Mention briefly important provisions in this act relating to prevention of accidents. **[8]**

Q7) a) Differentiate between Quality, Quality Control and Quality Management. **[8]**

b) Discuss the objectives of Quality Circles and the steps involved in implementing this concept in any organization. **[8]**

Q8) a) Discuss in brief any four important provisions in ISO 9001 relating to Quality Management in any organization - mention these provisions and discuss their utility towards achieving Quality Management in an organization. **[8]**

b) What are the provisions relating to the working hours and leaves as per the Factories Act, 1948? **[8]**

P1232   **[3766] - 34**

S.Y. M.C.A. (Under Faculty of Engineering)

DATA COMMUNICATION AND COMPUTER NETWORKS (215004)

(2005 Course)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates :

1) Answers to the two sections should be written in separate books.

2) Neat diagrams must be drawn wherever necessary.

3) Figures to the right indicate full marks.

4) Assume suitable data, if necessary.

SECTION - I

Q1) a)   Define computer communication. Explain with example, asynchronous transmission.   **[6]**

b)   Give examples of guided and unguided transmission media. Explain about any two unguided transmission media.   **[10]**

OR

Q2) a)   What is multiplexing? What are the different multiplexing techniques in data communication? Explain any two.   **[10]**

b)   Write a short note on geostationary satellites.   **[6]**

Q3) a)   Discuss various design issues related to data link layer.   **[8]**

b)   Explain in detail OSI model.   **[8]**

c)   Write any two differences between LAN & MAN.   **[2]**

OR

Q4) a)   Give brief details of the components mention, Bridges, Switches, connectors, Repeaters.   **[8]**

b)   What is switching? Explain message switching and packet switching techniques.   **[8]**

c)   What is HDLC?   **[2]**

Q5) a) Write a short note on Ethernet. **[8]**

b) Explain the working of WDMA protocol. **[8]**

OR

Q6) a) Explain the Bluetooth architecture with neat diagram. **[8]**

b) Explain persistent and non-persistent CSMA. **[8]**

SECTION - II

Q7) a) Discuss the various issues related with network layer Design. **[8]**

b) Give the details of Internet Protocol. **[8]**

OR

Q8) a) Write about different Congestion prevention policies. **[8]**

b) What are different routing algorithms, explain any one in detail. **[8]**

Q9) a) Explain the working of UDP. **[8]**

b) Explain the working of TCP. **[8]**

c) Draw the header format of TCP. **[2]**

OR

Q10) a) Explain the leaky bucket algorithm in detail. **[8]**

b) Explain the IPv6 protocol header format. **[4]**

c) Write a short note on "Congestion control". **[6]**

Q11) a) What are the important functions of the e-mail system? **[8]**

b) Write a short note on SMTP. **[8]**

OR

Q12) a) Explain the working of Hyper Text Transfer Protocol. **[8]**

b) Explain the working of File Transfer protocol. **[8]**

P1233   **[3766] - 43**

S.Y. M.C.A. (Engg.)

OBJECT ORIENTED MODELING AND DESIGN

(Sem. - IV) (2005 Course)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates :

1) *Answers to the two sections should be written in separate books.*

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

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

4) *Assume suitable data, if necessary.*

SECTION - I

Q1) a)   Explain the Object Oriented features with examples.   **[8]**

b)   Write short note on CORBA architecture.   **[5]**

c)   Explain the design view in 4 + 1 view architecture.   **[4]**

OR

Q2) a)   Explain in brief new features of UML 2.0.   **[8]**

b)   Explain in brief the Rational Unified Process.   **[5]**

c)   Write short note on XMI.   **[4]**

Q3) a)   Explain the UML Metamodel.   **[5]**

b)   What is the role of Use Case diagram in software development life cycle?
                                                                       [5]

c)   Explain the various extensibility mechanisms in UML 2.0.   **[7]**

OR

Q4) a)   What is OCL? Explain with example.   **[4]**

b)   Which are the various behavioural diagrams in UML 2.0? Explain role
     of each diagram in brief.   **[8]**

c)   Explain the benefits of using UML.   **[5]**

Q5) a) Define the scope of "Banking System" and draw Object diagram for it. **[8]**

b) Compare Interface and Class with an example. **[8]**

OR

Q6) a) Draw Class diagram for a "Hotel Management System". Make necessary assumptions. **[8]**

b) Explain the difference between <<include>> and <<extend>> relationship with example. **[4]**

c) Explain the Composite structure diagrams with example. **[4]**

SECTION - II

Q7) a) Draw sequence diagram for "Airline Reservation System". Make necessary assumptions. **[8]**

b) Discuss the concept of signals and exceptions. **[5]**

c) What is the need of interaction diagram. **[4]**

OR

Q8) a) Draw a communication diagram for "Travel Agency Management System". Make suitable assumption about the scope. **[8]**

b) Which are the different interaction diagrams? Explain each in brief. **[5]**

c) Explain Interaction Overview diagram with an example. **[4]**

Q9) a) Compare Activity diagram and State machine diagram. **[5]**

b) What is the need of activity diagram? Explain use of fork and join in activity diagram with an example system. **[8]**

c) What are Partitions and Regions? Explain. **[4]**

OR

Q10) a) Write a short note on the "use of timing diagram". **[4]**

b) List and explain the parts of state machine diagram. **[5]**

c) Draw an Activity diagram for "Inventory management system". Make the necessary assumptions. **[8]**

*Q11)*a) What is the use of package diagram? Explain with an example. **[5]**

b) What are the artifacts? Explain use of artifacts in deployment diagram with an example. **[7]**

c) What is the need of component diagram. **[4]**

OR

*Q12)*a) Describe the required and provisional interfaces with an example. **[5]**

b) Explain the UML Web applications? **[4]**

c) Draw a deployment diagram for any client - server application. Make suitable assumptions. **[7]**

P1234   **[3766] - 45**

S.Y. M.C.A. (Engineering)
JAVA PROGRAMMING
(2005 Course) (Sem. - IV) (215013)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates :

1)   *Answer any three questions from each section.*

2)   *Answer to the two sections should be written in separate books.*

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

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

SECTION - I

Q1) a)   What is the difference between interface and a class?   **[8]**

    b)   State any four features of Java?   **[8]**

OR

Q2) a)   What are the uses of super and this with respect to inheritance?   **[8]**

    b)   Explain life cycle of thread along with diagram?   **[8]**

Q3) a)   Explain how AWT helps GUI development?   **[9]**

    b)   List the methods of choice control? Also give the difference between choices and list?   **[9]**

OR

Q4) a)   Give uses of following swing control?   **[9]**

      i)   Jtabbed Pane   ii)   Jtable

      iii)   Jtree   iv)   Jframe.

    b)   Explain Layout manager with example.   **[9]**

Q5) a)   Write the applet to draw square inside circle?   **[8]**

    b)   Write the steps involved in developing and running a local applet?   **[8]**

OR

Q6) a) Write a simple applet to draw rectangle which is filled with red color?**[8]**

b) What is the difference an application and applet and give the ways to view an applet? **[8]**

SECTION - II

Q7) a) Explain the concept of creation of ZIP file stream in JAVA? **[8]**

b) What is exception handling? What are different types of exception which can be handled during input? **[8]**

OR

Q8) a) Give the syntax and use of following method? **[8]**

    i) Get Name ( )   ii) Get Parent

    iii) Get Path ( )   iv) Read Line ( ).

b) Write a program to perform following operation on student database using stream?

    i) Creation.   ii) Updation

    iii) Deletion. **[8]**

Q9) a) What are four driver available in JDBC? At what situation are four of the drivers used? **[9]**

b) How will you perform truncation using JDBC? **[9]**

OR

Q10) a) Compare JDBC and ODBC? How do you connect to the database? **[9]**

b) What is the use of statement class and how to retrieve data from result set? **[9]**

Q11) a) What do you mean by Socket programming? **[8]**

b) Explain the concept of proxy server? **[8]**

OR

Q12) a) What are the difference between TCP/IP and OSI reference model? **[8]**

b) Give syntax of following methods of datagram packet class? **[8]**

    i) Getport ( )   ii) Getdata ( )
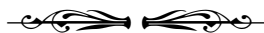
P1230

[3766]–32

S.Y. M.C.A.

DATABASE MANAGEMENT SYSTEMS

(2005 Course Under FOE Engg.)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates :

   1)   *Answers to the two sections should be written in separate books.*

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

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

   4)   *Your answers will be valued as a whole.*

   5)   *Assume suitable data, if necessary.*

SECTION - I

Q1) a)   With a neat diagram, explain the architecture of a Database Management System.   **[8]**

     b)   Discuss the advantages of DBMS as compared to file processing system.   **[8]**

OR

Q2) a)   List and discuss various database architectures you know.   **[10]**

     b)   What is meant by "speed-up" and "scale-up"?   **[6]**

Q3) a)   Draw an E-R diagram to model banking system so as to model information about customers, employees, savings and loan accounts, bank branches etc.   **[8]**

     b)   Construct relational tables using the E-R diagram drawn for the Q 3 (a).   **[4]**

     c)   Draw the schema diagram for the E-R diagram drawn in Q 3 (a).   **[6]**

OR

Q4) a)   What do you meant by "Generalization and specialization" and "aggregation"? Explain w.r.t. EER diagram.   **[6]**

b) With suitable examples, explain "derived", "multi-valued" and "composite" attributes and show the notations used in E-R diagram for these attributes. **[6]**

c) What do you meant by "strong" and a "weak" entity sets? What type of relationship holds between these types of entity sets? **[6]**

Q5) a) Explain the concepts of "Primary" and "Foreign" keys. **[4]**

b) What do you meant by a "schema" and "instance" of a relation? **[6]**

c) What is a need of views? Illustrate with suitable example. **[6]**

OR

Q6) a) What is the significance of the "Unique" and "References" clauses in a SQL DDL "Create Table" query? **[6]**

b) Write SQL query to create a relation. Assume suitable schema. **[6]**

c) Write SQL DDL query to drop an attribute from some existing relation. Assume suitable schema for the existing relation. **[4]**

SECTION - II

Q7) a) Consider following relations. **[12]**

employee (emp-name, street, city)

works (emp-name, comp-name, salary)

company (comp-name, city)

manages (emp-name, manager-name)

b) Write SQL DML queries to obtain.

i) Give employees of "First bank corporation" a 20% rise.

ii) Modify the database such that the employee "Satish" now lives in "Pune".

iii) Find the names and cities of residence of all employees who work for "First bank corporation".

iv) Find the names, street addresses and cities of residence of all employees who work for "First bank corporation" and earn more than Rs. 50000.

v) Delete all employees in works relation for employees of Small bank corporation.

vi) Find the company that has the most employees.

c) What is JDBC? Explain its significance. **[6]**

Q8) a) With suitable examples, explain SQL Insert Into and Delete queries. **[6]**

b) Explain use of set union and intersection operations in SQL DML queries. **[6]**

c) With suitable examples explain "Group By", "Having" and "Order By" Clauses. **[6]**

Q9) a) What is database normalization? Explain its purpose. **[4]**

b) Define First, Second, Third and Boycee-Codd Normal forms. **[8]**

c) What is a functional dependency? With a suitable example, explain transitive functional dependency. **[4]**

OR

Q10) a) Using the theory of Normalization, show your design for a college library management system. Justify your design. **[10]**

b) How Boycee-Codd normal form differs from Third Normal form? Which one is stronger, why? **[6]**

Q11) a) Explain the "ACID" properties that are used for Transaction Management. **[8]**

b) Consider the following two transactions : **[8]**

T_{11} : read (A)

read (B)

if A == 0 then B = B + 1

write (B)

T_{12} : read (B)

read (A)

if B == 0 then A = A + 1

write (A)

Add lock and unlock instructions to these transactions so that they observe the two-phase locking protocol. Can the execution of these transactions result in a deadlock.

OR

*Q12)*a)   Stable storage cannot be implemented.   **[4]**

   i)   Explain why it cannot be

   ii) Explain how database systems deal with this problem.

   b)   Explain the difference between the three storage types–volatile, nonvolatile
        and stable – in terms of I/O cost.   **[6]**

   c)   Compare the Shadow–paging recovery scheme with log-based recovery
        scheme in terms of ease of implementation and overhead cost.   **[6]**

▢▢▢▢

P1231   **[3766]-33**

M.C.A. - II (Engg. Faculty)

FINANCIAL ACCOUNTING & MANAGEMENT

(2005 Course) (Theory) (215003)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates :

1) *Answers to the two sections should be written in separate answer books.*
2) *Figures to the right indicate full marks.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Assume suitable data, if necessary.*
5) *Use of electronic pocket calculator is allowed.*

SECTION - I

Q1) a) What do you understand by the term 'Accounting concepts'? Explain any four 'Accounting concepts'. **[5]**

b) Record the following transaction would appear in the journal of Vishal.

2009,   Aug 1   :   Vishal started business with cash Rs. 1,00,000/-.

      Aug 2   :   Vishal bought goods from Rahul on cash basis Rs. 14,000/-.

      Aug 4   :   He sold goods to Darpan on credit Rs. 8,000/-.

      Aug 5   :   He purchased furniture for office use Rs. 20,000/-.

      Aug 9   :   He received Rs. 10,000/- from Darpan.

      Aug 12 :   He sold goods to Darpan on credit Rs. 12,000/-.

      Aug 15 :   He paid travelling expenses Rs. 4,000/-.

      Aug 16 :   He received Rs. 10,000/- from Darpan.

      Aug 20 :   He deposited Rs. 20,000/- into bank.

      Aug 30 :   He received commission Rs. 38,000/- in cash.   **[15]**

OR

From the following trial balance of Mr. Yash as on 31st March, 2009, you are requested to prepare the Trading and Profit and Loss Account for the year ended 31st March, 2009 and the balance sheet as on that date after making the necessary adjustment.

Particular	Debit (Rs.)	Credit (Rs.)
Wages	1,00,000	
Sundry Debtors	5,00,000	
Sundry Creditors	-	2,00,000

P.T.O.

Carriage Outward	1,10,000	-
Carriage Inward	50,000	-
General Expenses	70,000	-
Cash Discount	20,000	-
Bad Debts	10,000	-
Motor Car	2,40,000	-
Printing & Stationary	15,000	-
Furniture & Fittings	1,10,000	-
Advertisement	85,000	-
Insurance	45,000	-
Salesmen commission	87,500	-
Postage & Telephone	57,500	-
Salaries	1,60,000	-
Rates & Taxes	25,000	-
Drawings	20,000	-
Capital Account	-	13,88,000
Purchase	15,50,000	-
Sales	-	19,87,500
Stock on 1.4.08	2,50,000	-
Cash at Bank	10,500	-
Cash in Hand	60,000	-
Total	35,75,500	35,75,500

The following adjustments are to be made:

i) Depreciate :
   a) Furniture & Fittings by 10%.
   b) Motor car by 20%.

ii) A provision for Bad & Doubtful Debts is to be created to the extent of 5% on Sundry Debtors.

iii) Mr. Raju has withdrawn goods worth Rs. 25,000/- during the year.

iv) Stock on 31st March, 2009, was valued at Rs. 7,25,000/-.

v) Purchase include purchase of Furniture worth Rs. 50,000/-   **[20]**

Q2) a) Draw the proforma (format) for preparation of cost sheet.   **[10]**

   b) What are the factors causing Idle time for labour?   **[5]**

<p align="center">OR</p>

   a) Explain the concept of cost-volume - profit analysis (with diagram). For Mechanics of Break Even Chart.   **[10]**

   b) Explain the concept of Margin of Safety.   **[5]**

Q3) A proforma cash sheet of a company provides the following particulars.

Element of cost	Amount per unit (Rs.)
Raw material	80
Direct labour	30
Overheads	60
Total cost	170
Profit	30
Selling price	200

The following further particulars are –

a) Raw materials are in stock average two months.

b) Materials are in process on average one month.

c) Finished goods are in stock on average two months.

d) Credit allowed by suppliers is two months.

e) Credit allowed to Debtors is two months.

f) Cash on hand and bank is expected to Rs. 50,000/-.

You are required to prepare a statement showing working capital needed to finance a level of activity of 1,00,000 units of production.

You may assume that production is carried out evenly throughout the year and a time period of 4 weeks is equivalent to a month. **[15]**

OR

What are the factors affecting working capital requirement? Explain the need of working capital managements. **[15]**

SECTION - II

Q4) a) XYZ Co., is about to take up a project, at has two options to choose from : Project 'X' & Project 'Y'. Suggest the Co. about selection of project based on payback period method.

Project 'X'		Project 'Y'	
Year	Cash Inflow/ (Cash Outflow)	Year	Cash Inflow/ (Cash Outflow)
0	(50,000)	0	(70,000)
1	22,000	1	40,000
2	22,000	2	32,000
3	22,000	3	20,000
4	22,000	4	20,000

[15]

b) State any two advantages & any three disadvantages of pay-back period method for evaluation of Capital Budgeting decision. **[5]**

OR

a) What are the limitations of Capital Budgeting process? **[10]**

b) Explain the different techniques for evaluation of capital expenditure proposal. **[10]**

Q5) Z. Co. Ltd. issues Rs. 10,00,000/- 12% Debentures of Rs. 100/- each. The debentures are redeemable after the expiry of 7 years. The tax rate applicable for the company is 35%.

Required to –

a) Calculate the cost of debt after tax, if debentures are issued at –
   i) Par
   ii) 15% Discount
   iii) 15% Premium

b) If the brokerage is paid at 5%. What will be the cost of debentures, if issued at par? **[15]**

OR

a) Zee Corporation Ltd. issued Rs. 5,00,000/- 15% preference shares of Rs. 100/- each. at 10% premium. The flotation cost was 4% the preference shares will be redeemed at premium of 10% after 7 years. The Marginal Rate of the tax for the company is 40% compare the cost of preference shares to the company. **[8]**

b) Explain the concept of Weighted Average Cost of Capital (WACC) with proper example supporting your explanation. **[7]**

Q6) Explain the use & importance of Tally as on Accounting Software. **[15]**

OR

Write a note on following terms. **[15]**
a) Purchase Vouchers.
b) Payment Vouchers.
c) Debit Note Vouchers.
d) Credit Note Vouchers.
e) Sales Vouchers.

⬜⬜⬜⬜

P1235   **[3766]-51**

Third Year M.C.A. (Engg.)
PRINCIPLES AND PRACTICES FOR IT MANAGEMENT
(2005 Course) (315001)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates:

1)   Answers to the two sections should be written in separate books.

2)   Neat diagrams must be drawn wherever necessary.

3)   Figures to the right indicate full marks.

4)   Assume suitable data, if necessary.

SECTION - I

UNIT -I

Q1) a) Explain concept of management, administration and organization in detail.   **[10]**

   b) Explain the importance of social responsibilities in IT industry.   **[7]**

OR

Q2) a) Explain the difference between planning and controlling functions of management with suitable example.   **[10]**

   b) Give detail idea about different policies of business in IT industries.**[7]**

UNIT - II

Q3) a) Explain different scenario or methods for cost and effort estimation of an IT project.   **[10]**

   b) What are different strategies involved in budgeting of an IT project? Explain in brief.   **[6]**

OR

Q4) Write short notes on <u>any four</u> :   **[16]**

   a) Risk management of an IT project.

   b) Breakdown structure of a software project.

   c) Requirement gathering and analysis.

   d) Formal technical review of the project.

   e) Defining and setting project scope and priorities.

UNIT - III

Q5) a) Explain the need of project schedule. What are various scheduling methods for an IT project? Explain in brief. **[9]**

b) Explain followings : **[8]**

i) Organization of project team.

ii) Progress tracking of project.

OR

Q6) a) What are different constraints during project implementation and execution? Explain in detail. **[9]**

b) Explain the followings : **[8]**

i) Revision/changes in IT project.

ii) Resource procurement for an IT project.

SECTION - II

UNIT - IV

Q7) a) What should a manager do to influence the behaviour of his employees in the direction of organizational goals? **[8]**

b) Write notes on <u>any two</u> : **[8]**

i) Formal and informal group formation.

ii) Importance of group dynamics.

iii) Employee welfare.

OR

Q8) a) What are informal groups? Discuss a suitable strategy for the effective utilization of informal groups. **[8]**

b) Write notes on <u>any two</u> : **[8]**

i) Conflict Management.

ii) Importance of Team Work.

iii) Energy management and audit.

UNIT - V

Q9) Explain different project quality standards (six-sigma, CMM, CMMI and PCMM) in detail. Briefly explain the processes involved in various project quality standards. **[17]**

OR

Q10) a) What is knowledge management? Explain in detail. **[7]**

b) Write details about <u>any two</u> : **[10]**

     i) Cyber laws and processes related to cyber laws.

     ii) Intellectual Property Rights (IPR).

     iii) Supply chain management.

<u>UNIT - VI</u>

Q11) Explain the application of IT management of any one of the following manufacturing sector. Take suitable model/example to explain.

a) Personnel Management.

b) Production Management.

c) Marketing Management. **[17]**

OR

Q12) a) Identify distinguish features of MIS in service industry as against manufacturing industry. **[7]**

b) Applications in service industry will be efficient and effective, if appropriate IT and IT infrastructure is chosen. Explain with reasons.**[10]**

⊠⊠⊠⊠

P1239

[3766]-101

M.C.A. (Engineering Faculty)
PROBLEM SOLVING AND PROGRAMMING IN C (510901)
(2008 Course)

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

Instructions to the candidates:

1) *Answer any three questions from each section.*
2) *Answers to the two sections should be written in separate answer books.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right indicate full marks.*
5) *Assume suitable data, if necessary.*
6) *Steps of Hand running must be shown wherever output of the program is asked.*

SECTION - I

Q1) a) Explain in brief how to construct a loop during program implementation with suitable example. **[6]**

b) Devise an algorithm to compute $1/n!$, for a given n. **[6]**

OR

Q2) a) Explain in brief with suitable example about Redundant Computations and Referencing array elements for designing efficient algorithms. **[6]**

b) Devise an algorithm that counts the number of digits in an integer. **[6]**

Q3) a) Explain in brief about Local and Global variable. What is meant by the scope of a variable within a program? **[6]**

b) Write a loop that will calculate the sum of every third integer beginning with i = 2 (i.e. calculate the sum $2 + 5 + 8 + 11...$) for all values of i that are less than 100. Write the loop in two different ways. **[6]**

     i) using a while statement.
     ii) using a do while statement.

OR

Q4) a) Distinguish between the following with suitable example : **[6]**

     i) Declaration and Definition of a function.
     ii) Formal argument and Actual argument in function.

b) Write a C program to exchange the values of two variables without using third variable. **[6]**

Q5) a) Why we need an Array? Write an appropriate array definition for the following : **[5]**

      i) Define a 1-D, four element character array called *letters*. Assign the characters 'N', 'S', 'E' and 'W' to the array elements.

      ii) Define a 2-D, 2 × 2 integer array called *n*. Assign the following values to the array elements 10 14 15 16.

      iii) Define a 2-D, 3 × 6 character array called *colors*. Assign the following values to the array elements RED GREEN BLUE.

    b) Write a C program to check given string is Palindrome or not. **[6]**

<div align="center">OR</div>

Q6) a) List out *any three* string library functions used in C with basic syntax. Compare gets ( ) and puts ( ) function in C. **[5]**

    b) Write a C program to compare two string without using string library function. **[6]**

<div align="center">

SECTION - II

</div>

Q7) a) Distinguish between the parameter techniques a Call by Value and Call by Address with a suitable example. **[6]**

    b) What is the output of the following program? **[6]**

```
#include<stdio.h>
int main( )
{
    int *p, i = 10;
    p=&i;
    i++;
    printf("%d %d \n", i, *p);
    i= i + 10;
    printf("%d %d \n", i, *p);
    *p = *p+ 10;
    printf("%d %d \n", i, *p);
    (*p)++;
    printf("%d %d \n", i, *p);
    printf("Enter a value for i \n");
    scanf("%d",p);
    printf("%d %d \n", i, *p);
    return 0;
}
```

<div align="center">OR</div>

Q8) a) Explain dynamic memory allocation functions malloc () and reaclloc () in C with suitable example. **[6]**

b) Write a C program to convert all the small case alphabets to capitals using pointer. **[6]**

Q9) a) Explain command-line arguments with an example. **[6]**

b) Explain two bitwise shift operators. Write the output of following program. **[6]**

```
int main()
{
    unsigned a = 0XF05A
    printf("%x\n", a>>6);
    printf("%x\n", a<<4);
}
```

OR

Q10) a) Explain various storage classifiers in C. **[6]**

b) Write a macro definition for each of the following : **[6]**
   i) Write a macro called MAX that utilizes the conditional operator (? :) to determine the maximum of a and b, where a and b are integers.
   ii) Rewrite above macro so that a and b are expressed as arguments.
   iii) Define a macro called CIRCUMFERENCE, which will calculate the circumference of a circle in terms of its radius. Also use PI as macro.

Q11) a) Write *any four* file type specifications with their meaning. **[4]**

b) Write a C program that reads a file containing uppercase text and convert it into lowercase text. **[7]**

OR

Q12) a) Explain the use of following functions in C. **[4]**
   i) fgetc()
   ii) fputc()

b) Write a C program to copy data from one file to other using file handling. **[7]**

✳ ✳ ✳

P1240

[3766]-103

F.Y. M.C.A. (Under Faculty of Engineering)
FOUNDATIONS OF INFORMATION TECHNOLOGY
(2008 Course) (510903)

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

*Instructions to the candidates:*

    1)   *Answer three questions from each section.*

    2)   *Answers to the two sections should be written in separate books.*

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

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

    5)   *Assume suitable data, if necessary.*

SECTION - I

Q1) a) What are the five basic operations performed by any computer system?**[4]**

    b) How many types of storage are normally there in the storage unit of a computer system. Justify the need for each storage type. **[4]**

    c) Convert $(11010011)_2 = (?)_{16}$ **[4]**
           $(ABC)_{16} = (?)_2$

OR

Q2) a) Show the binary digits used to record the word base in BCD. **[4]**

    b) Find the boolean expression for the output of the logic circuit given below. **[4]**
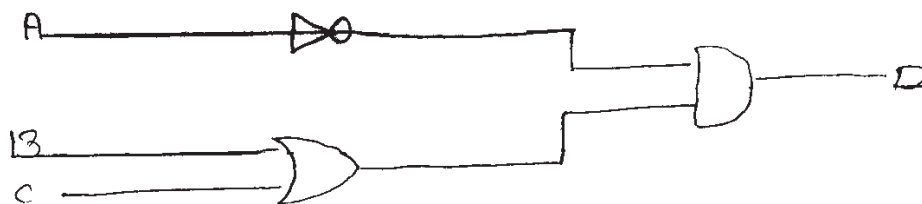
    c) Name the technologies used for constructing main memory in the computers of first, second, third and fourth generations. **[4]**

Q3) a) Differentiate between CISC and RISC processors. **[4]**

    b) List out the main limitations of magnetic tapes as a secondary storage device. **[4]**

    c) Explain the printing mechanism of Dot Matrix printers. **[4]**

<center>OR</center>

Q4) a) When is a computer said to be upward compatible with another computer? How is this feature useful for the users of these computers? **[4]**

b) What are bar codes? How does a bar code reader read bar code data? Give a typical use of a bar code reader? **[4]**

c) What is disk formatting? Why is it needed? **[4]**

Q5) a) How many types of software are there? Give three examples of each? **[6]**

b) What are the advantages of HLL? **[5]**

<center>OR</center>

Q6) a) Differentiate among H/W, S/W and firmware. **[6]**

b) It is said that an assembly language is "one-for-one", but a high level language is "many-for-one". Explain what this means. **[5]**

<center>

SECTION - II
</center>

Q7) a) What is a process control block? Why is it needed? What does it typically contain. **[6]**

b) Define the following terms : **[3]**
   i)   Throughput.
   ii) Turn around time.
   iii) Response time.

c) Explain how a cell address can be made fully or partially absolute when used in a formula. **[3]**

<center>OR</center>

Q8) a) What is swapping? How does it help in memory management? **[4]**

b) What is meant by WYS/WYG facility? How is it useful? **[3]**

c) What is cryptography? How does it help in improving the security of computer system. **[5]**

Q9) a) How are records stored in an indexed sequential file? How are they retrieved and processed? **[4]**

b) Write a short note on multimedia applications. **[4]**

c) Differentiate between syntax errors & logical errors. **[4]**

Q10) a) What type of operations is normally carried out in the system change over process? **[4]**

b) What is data redundancy? Explain with an example. **[4]**

c) What is a multimedia computer system? What are it's typical characteristics. **[4]**

Q11) a) Differentiate between analog and digital transmission of data. Give their disadvantages. **[8]**

b) What is the Internet? How did it evolve? **[3]**

OR

Q12) a) What is a www browser? What types of navigation facilities are typically supported by modern browsers to help users save time while Internet surfing? **[8]**

b) What is a coaxial cabel? **[3]**

✸ ✸ ✸

P1242 **[3766]-201**

First Year M.C.A. (Engineering)
OBJECT ORIENTED PROGRAMMING
(2008 Course) (510909)

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

Instructions to the candidates:
1) *Answer three questions from section-I and three questions from section-II.*
2) *Answers to the two sections should be written in separate books.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right indicate full marks.*

SECTION - I

Q1) a) "OOP gives better support for program development and maintenance than procedural programming". Justify. **[5]**

b) Write the output for the following C++ programs. **[6]**

i)
```cpp
# include < iostream.h >
int cow = 5;
void main ()
{
    int cow = 5;
    cout << cow << endl << : : cow;
}
```

ii)
```cpp
# include < iostream.h >
void main ()
{
    char * poster = " multiplex";
    char * placard = poster;
    cout << poster << endl << placard;
    placard = " screen 1";
    cout << poster << endl << placard;
}
```

iii)
```cpp
# include < iostream.h >
void main ()
{
    char * parrot = " Hello";
    parrot = " Hi";
    *parrot = 'G';
    cout << parrot;
}
```

Q2) a) "Inheritance in OOP is useful in order to show relationship between real world objects". Justify. **[5]**

b) Write the output for the following C++ programs **[6]**

i)
```
# include < iostream.h >
int digit = 20;
void main ()
{
    int digit = 5;
    cout << digit << endl << : : digit;
    {
        int digit = 10;
        cout << digit << endl << : : digit;
    }
}
```

ii)
```
# include < iostream.h >
void main ()
{
    int myvariable = 5;
    int & yourvariable = myvariable;
    int parameter = 10;
    yourvariable = parameter;
    cout << endl << myvariable << endl << parameter;
    parameter = 20;
    cout << endl << myvariable << endl <<parameter;
}
```

iii)
```
# include < iostream.h >
void main ()
{
    int b;
    cout <<sizeof (b) << endl << sizeof ('b');
}
```

Q3) a) Write overloaded function to convert an int to an ascii string and to convert a float to an ascii string. **[6]**

b) Explain in brief. **[6]**

i) What is the difference between char s[] = "Hello"; and char * s = "Hello";

ii) What is the size of an empty class?

iii) What are the advantages of cout and cin over printf() and scanf()?

Q4) a) Write a C++ program to give following output. **[6]**

$$1$$
$$1 \quad 2 \quad 1$$
$$1 \quad 2 \quad 3 \quad 2 \quad 1$$

b) Explain in brief : **[6]**

i) Can inline functions be nested?
ii) What are the conditions for overloading the functions?
iii) What is the delete operator?

Q5) a) Give the significance of 'this' pointer and illustrate it use with a sample program. **[6]**

b) Write a program to dynamically allocate and deallocate memory for a m x n matrix. **[6]**

OR

Q6) a) What are static data members and static functions? Explain with an example. **[6]**

b) What are inline functions? Write a program to implement inline function for string change such that the changed string contains alternate characters of the original string, starting with the first character. For example : original string = "magnificent" changed string = "mgiiet".**[6]**

SECTION - II

Q7) a) What is operator overloading? Explain its need. **[5]**

b) Write a program to overload the '+' operator such that it carries out the addition of 2 matrices. **[6]**

OR

Q8) a) Discuss rules for operator overloading. **[5]**

b) Write a program to overload '-' operator for getting the substring. **[6]**
For example : stringtemp = "examination"
stringtemp - 5 = "examin"

Q9) a) What are the various types of inheritance in C++? Explain hybrid inheritance. **[6]**

b) Explain virtual function with an example. **[6]**

OR

Q10) a) Explain the problem of ambiguity with an example. **[6]**

b) Discuss in brief : **[6]**

    i)   Container classes.
    ii)   Pure Virtual Function.
    iii)   Late Binding.

Q11) a) Write a C++ program to **[6]**

    i)   Create a structure, student having attributes like name, roll no & course name.

    ii)   Create a class to include the student structure and write methods to take information about the student and add it to a 'student.dat' file.

b) What is error handling? Write a program to handle a user defined error which is thrown whenever there is a divide by zero error. **[6]**

OR

Q12) a) Discuss formatted and unformatted I/O manipulators. **[6]**

b) Write a program to read the contents of a file and append '#' at the end of each record. **[6]**

☒☒☒☒

P1243   **[3766]-303**

Second Year M.C.A. (Engineering)
FINANCIAL ACCOUNTING AND MANAGEMENT
(2008 Course) (610903)

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

Instructions to the candidates:
   1)   Answers to the two sections should be written in separate books.
   2)   Neat diagrams must be drawn wherever necessary.
   3)   Figures to the right indicate full marks.
   4)   Assume suitable data, if necessary.
   5)   All questions are compulsory.

SECTION - I

UNIT - I

Q1) a) What is financial accounting? What are different terms used in accounting? Explain them in brief.   **[6]**

   b) Explain various processes involved or steps involved in followings :**[6]**
       i)   Book keeping.
       ii) Recording of transactions.

OR

Q2) Write notes on <u>any three</u> with examples :   **[12]**
   a) Balance sheet.
   b) Profit and loss accounts.
   c) Cost accounting.
   d) Accounting principles.
   e) Functions of a finance officer.

UNIT - II

Q3) a) From the following data, find out   **[8]**

   i)   Break even point expressed in amount.
   ii) No. of units that must be sold to earn a profit of Rs.1,60,000 per year.

       Selling price = Rs.20/- per unit.

       Variable cost = Rs.14/- per unit.

       Factory overhead = Rs.5,40,000/- per annum.

       Fixed selling cost = Rs.2,52,000/- per annum.

   b) Explain the importance of ratio analysis in brief.   **[4]**

Q4) a) As the general manager of a company. What ratios are useful to you in evaluating the financial performance and strength of your company? Explain in short. **[4]**

b) European cables has a after-tan profit of Rs.60,000/- and taxation rate is 40 percent. Its sales are Rs.3,48,500/-. Its variable cost of production is Rs.6 per unit and sales price is Rs.12 per unit.

   i) What is its fixed costs?

   ii) What is its break even point in

      • Units of output, and

      • Rupees? **[8]**

UNIT - III

Q5) a) What are current assets? How do they differ from fixed assets? **[3]**

b) For ABC Pvt. Ltd., find out followings with given data **[8]**

   i) Total asset turnover for the firm.

   ii) Rate of return on total assets before taxes.

      Sales level = Rs.1,40,000/-

      Profit margin = 10% (before and after tax)

      Fixed asset investment = Rs.50,000/-

      Current asset = Rs.25,000/-

OR

Q6) a) Define and explain followings : **[8]**

   i) Working capital.

   ii) Sources of working capital.

   iii) Uses of working capital.

   iv) Features of capital.

b) Discuss the working capital policy in brief. **[3]**

SECTION - II

UNIT - IV

Q7) a) Explain process of capital budgeting for any project. **[6]**

b) Let us assume that a company wants to install a new machine costing Rs.25,000/- with an expected life of 5 years. It will replace an old machine which can be sold for its depreciated book value of Rs.2,500/-. The net cash outflow for the investment project is Rs.22,500/-. The new machine is expected to result in annual cost savings of Rs.9,500/- a year before taxes for 5 years after which it will have no salvage value. **[6]**

i) What will be the additional net income with new machine? and

ii) Find out the rate of return on this project.

<center>OR</center>

Q8) a) How is capital budgeting technique relevant in investment decisions? What are the steps involved in investment decisions making process.**[6]**

b) XYZ bank pay a customer, Rs.1,20,000/- at the end of 7 years of deposit of Rs.12,000/- a year for 7 years in a recurring deposit account. What is the net present value of customer's investment if required rate of return is 10%? What is the internal rate of return? **[6]**

<center>

UNIT - V

</center>

Q9) a) What is cost of capital? Why should a financial manager know the cost of capital of his firm? **[6]**

b) A company has issued bonds with the face value of Rs.1,000/- each. Rate of interest is 8 percent, tax for the company is 52 percent and the company has taxable income. What is the cost of debt capital? **[6]**

<center>OR</center>

Q10) a) Explain followings : **[6]**

i) Cost of debt capital.

ii) Cost of preference shares.

iii) Cost of equity.

b) A share holder purchased a share of Rs.500/-. For 5 years he received dividend at the rate of 10% per year. At the end of 5 years, he sold his share for Rs.650/-. What is his rate of return? **[6]**

<center>

UNIT - VI

</center>

Q11) a) Enlist and describe the features of a software package which will be useful for financial management. **[6]**

b) What are important components in a software package (like Tally 9.0) for financial accounting purpose? **[5]**

<center>OR</center>

Q12) a) How the different services of Tally 9.0 is useful to a finance manager/ officer? **[6]**

b) "The use of IT infrastructure (i,e computer, software and communication devices) has given a new dimension to financial sector". Evaluate this statement critically. **[5]**

<center>☒☒☒☒</center>

P1577

[3766]-12

First Year M.C.A (Engg.)
MT. 11 : DISCRETE MATHEMATICS
(New) (2005 Pattern)

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

Instructions to the candidates:

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

Q1) a) Prove that,

$(p \rightarrow (q \rightarrow r)) \Rightarrow ((p \rightarrow q) \rightarrow (p \rightarrow r))$ **[5]**

b) Draw the Diagraph for the following relation and determine whether the relation is reflexive, symmetric, transitive and antisymmetric.
A = {1, 2, 3, 4, 5, 6, 7, 8} and let xRY whenever Y is divisible by x. **[5]**

c) Show that the maximum no. of edges in a simple graph with n vertices is

$\dfrac{n(n-1)}{2}$.   **[5]**

d) Define Abelian group. Show that $(Z_6, +)$ is a Abelian group.   **[5]**

e) Show that q is a valid inference from the premises $p \rightarrow q$, $p \vee q$ and $\bar{q}$. **[5]**

f) State handshaking lemma. How many nodes are necessary to construct a graph with exactly 48 edges in which each node is of degree 2.   **[5]**

Q2) a) Find the Conjunctive Normal Form (CNF) and Disjunctive Normal Form (DNF) for the following.   **[6]**

i) $(p \veebar \bar{q}) \rightarrow q$.

ii) $p \times (\bar{p} \vee \bar{q})$.

b) Using Truth table method find following statement is tautology, contradiction or contigency   **[4]**

$(p \rightarrow (q \rightarrow r)) \rightarrow ((p \rightarrow q) \rightarrow (p \rightarrow r))$

c) Determine the validity of following statement   **[5]**

    S_1 : All my friends are players.

    S_2 : Smith is my friend.

    S_3 : None of my neighbours are players.

    $\overline{\phantom{S_3 : \text{None of my neighbours are players.}}}$

    S : Smith is not my neighbour.

d) Rewrite the following using quantifiers variables and predicate symbols.

    [5]

    i)   All birds can fly.

    ii)   Not all birds can fly.

    iii)   Some men are genius.

    iv)   Some numbers are not rational.

    v)   There is a student who likes mathematics but not geography.

Q3) a) Draw the Hasse diagram for the relation R on A = {1, 2, 3, 4, 5} whose relation matrix is given below.   **[5]**

$$M_R = \begin{bmatrix} 1 & 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

b) Let R be a relation on set A = { 1, 2, 3, 4, 5} and find the transitive closure of R by Warshall's algorithm.   **[5]**

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

c) Explain the following functions with example.   **[5]**

    i)   Hashing function.

    ii)   Partial function.

    iii)   Inverse function.

    iv)   Injective function.

d) Find the inverse of the following functions :   **[5]**

    i) $f(x) = \dfrac{7 + 4x}{6 - 5x}$.

    ii) $f(x) = x^3 + 2$.

Q4) a) Show that the algebric system (A, +) is a monoid where A is a set of integers C + is a binary operation giving addition of two integers.   **[5]**

b) Let R = {0°, 60°, 120°, 180°, 240°, 300°} and ∗ = binary operation, so that for *a* & *b* in R *a*∗*b* is overall angular rotation corresponding to successive rotations by *a* and then by *b*. Show that (R,∗) is a group.**[5]**

c) Consider the (3, g) encoding function e. **[5]**

e (000) = 000000000   e (100) = 010011010
e (001) = 011100101   e (101) = 111101011
e (010) = 010101000   e (110) = 001011000
e (100) = 110010001   e (111) = 110000111

   i)   Find the minimum distance of e.
   ii)   How many errors will e detect?

d) Define with example (with respect to groups). **[5]**
   i)   Cyclic group.
   ii)   Quotient groups.
   iii) Permutation group.
   iv) Monoid.
   v)   Semigroup.

Q5) a) Explain Isomorphism. State whether the given graphs are isomorphic or not. **[5]**
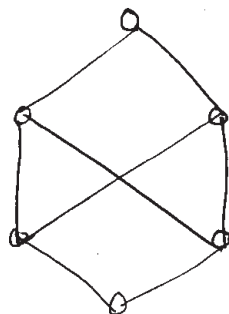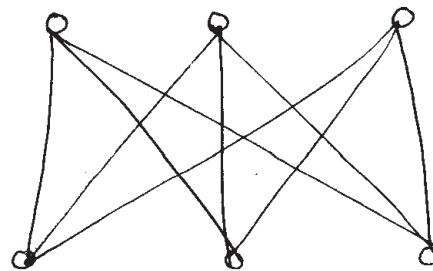
b) Determine the number of regions defined by a connected planer graph with 6 nodes and 10 edges. Draw a simple and non-simple graph. **[5]**

c) Determine the number of edges in a graph with 6 nodes, 2 of degree 4 and 4 of degree 2. Draw two such graphs. **[5]**

d) Define the following graphs and give an example of each. **[5]**
   i)   Bipartite graph.
   ii)   Complete graph.
   iii) Weighted graph.
   iv) Planner graph.
   v)   Factors of graph.

✳ ✳ ✳

[3766] - 21
F. Y. M.C.A. (Engineering)
OBJECT ORIENTED PROGRAMMING
(2005 Course) (115009)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates:
    1)   *Answer three questions from Section I and three questions from Section - II.*
    2)   *Answers to the two sections should be written in separate books.*
    3)   *Neat diagrams must be drawn wherever necessary.*
    4)   *Figures to the right indicate full marks.*

SECTION - I

Q1) a)   Compare procedural programming and Object Oriented Programming.
                                                                    [7]

      b)   Explain the following with example :   **[10]**
          i)   Data encapsulation.
          ii)   Data abstraction.
          iii) Message passing.
          iv) Polymorphism.
          v)   Methods.

<div align="center">OR</div>

Q2) a)   What are the limitations of procedural programming?   **[5]**

      b)   Explain any six features of object oriented Programming giving example.
                                                                                   [12]

Q3) a)   What is function overloading? Write a program in C++ to overload a function Area() that Calculates area of Circle, triangle, or a rectangle.**[8]**

      b)   What is a static member function? Explain with example.   **[4]**

      c)   What is a constructor? Explain different types of constructors.   **[5]**

<div align="center">OR</div>

Q4) a)   What is a friend function? Explain with example.   **[6]**

      b)   What is a inline member function? Explain with example.   **[4]**

c) Write a program in C++ for creating a temporary database of students using array of objects. **[7]**

Q5) **a)** What is operator overloading? What are the rules for' operator overloading? **[6]**

b) What is the peed for Inheritance? Explain different types of Inheritances. **[4]**

c) Write a program in C++ making use of hybrid Inheritance. **[6]**

<div align="center">OR</div>

Q6) **a)** What is operator overloading? List the operators that cannot be overloaded as a member function. **[4]**

b) What is type conversion? Explain different types of type conversion with example. **[4]**

c) What is Runtime polymorphism? Write a program in C++ that makes use of Runtime polymorphism and Hierarchical Inheritance. **[8]**

<div align="center">

SECTION - II

</div>

Q7) **a)** What is generic programming? Explain how templates are useful for generic programming. **[7]**

b) Write a program in C++ that can create a array of integers, float, or double and find the largest element in that array using template class and template function. **[10]**

<div align="center">OR</div>

Q8) **a)** What is a template function? Can we overload a template function? Explain with example. **[8]**

b) Write a program in C++ to create a array of integer, float or double and. sort them using bubble sort technique. Make use of template class and template function. **[9]**

Q9) **a)** What is exception Handling? What are the steps for exception handling in C++? Give example. **[7]**

b) Write a program in C++ to create a employee database and store it in a sequential file named emp. dat. make use of structures. **[10]**

<div align="center">OR</div>

Q10) a) What are the different modes for opening a file in C++. **[6]**

b) Explain various file error handling functions in C++. **[4]**

c) Write a program in C++ for reading and writing a class object into a file. **[7]**

Q11) a) List various features of Java and explain any four with example. **[8]**

b) What is exception Handling? What are the steps for exception handling in Java? **[8]**

OR

Q12) a) What is an Interface? Explain how it is useful in implementing multiple inheritance? **[6]**

b) Compare C++ with Java. **[6]**

c) "Inheritance in Java" Explain. **[4]**

✪✫✪✫

P1579

[3766] - 42
Second Year M.C.A. (Engineering)
WEB TECHNOLOGY
(2005 Course) (215010)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates:

1) Figures to the right indicate full marks.
2) Answers to two sections should be written in separate answer books.
3) From Section I, Answer (Q.1 or Q.2) and (Q.3 or Q.4) and (Q.5 or Q.6).
4) From Section II, Answer (Q.7 or Q.8) and (Q.9 or Q.10) and (Q.11 or Q.12).
5) Make suitable assumptions wherever appropriate and relevant.

SECTION - I

Q1) a) Explain with examples and scenarios how Internet and different popular online websites of Internet (Hint : one example is facebook, yahoo) are helping in communicating with friends, keeping in touch and sharing with friends. **[6]**

b) How does host to host communication happen, how does data transfer happen in computer networks. Explain above concepts using OSI layer, the layered concept and neat diagrams. **[6]**

c) Give a brief, description of all the four connecting devices. Compare and contrast clearly bridges and routers. **[6]**

OR

Q2) Write short notes on any three : **[18]**

a) Protocol suites of TCP-IP at different layers.

b) HTTP command types.

c) Static and Dynamic WebPages.

d) Browser features (like plug-in, scripting support etc.).

Q3) a) Consider a Web Page (Home page) for a online BOOK SHOP that has to display a page of information about the shop. The web page minimally has information about the company, its location in one FRAME. The second vertical FRAME has the LIST of products sold. The second frame also has a TABLE showing ten best seller books with their costs.

P.T.O.

Make suitable assumptions. Show a screen shot of the page you have designed with some sample data. Use HTML to design a nice looking, user friendly web page for same using HTML concepts like FRAME, TABLE, LIST etc. **[8]**

b) In the context of evolution of HTML, what do you understand by SGML, XHTML and how do they compare with HTML. **[4]**

c) What are hypertext links, their use and HTML syntax for links. **[4]**

OR

Q4) a) Write short notes on HTML FORMS. **[6]**

b) What are FRAMES and how does one design frames in HTML, illustrate with examples of your own. **[6]**

c) What is CSS, its use, its advantages, what if there was No CSS. **[4]**

Q5) a) What do you understand by object oriented programming languages. What object oriented features are supported by Java script? **[4]**

b) Write about the concept, syntax, typical use of OBJECTS in JavaScript. **[4]**

c) Write a small piece of code to illustrate use of predefined object STRING of JavaScript (). **[4]**

d) What do you understand by types and dynamic typing. **[4]**

OR

Q6) In context of Java Script illustrate with examples, what you understand by **[16]**

a) Exceptions.
b) Conditional statements.
c) Arrays.
d) Syntax for Single line, multi line comments.

SECTION - II

Q7) a) What can one do with JavaScript, illustrate with examples. **[6]**

b) What is a FORM, what kind of Form events are available in JavaScript. **[6]**

c) Write one WINDOWS object related to JavaScript execution environment. **[4]**

OR

Q8) a) What is a DOM tree. What do you understand by DOM concepts like nodes, methods, properties. **[6]**

b) Write simple code examples in HTML/DOM to Change text of an HTML page. **[6]**

c) What is and how do you use : 'document.getElementById'. **[4]**

Q9) In context of java SERVLETS write on following : **[16]**
a) What are Servlets.
b) Relation of Servlets to Java.
c) What is CGI and comparison of Servlets to CGI.
d) HTTP Request Response in a web servlet application.

OR

Q10) a) Write short notes on Webservers. **[6]**

b) Consider a simple scenario of a web page with a simple message "HELLO WORLD". Write a servlet for above example. **[6]**

c) Why web sites are preferred even for business. **[4]**

Q11) In context of developing networking applications, write on following **[18]** concepts
a) UDP, TCP and TCPIP.
b) Ports.
c) Proxy servers with Filtering, caching aspects.

OR

Q12) Write short notes on any three : **[18]**
a) Internet : technologies, applications.
b) Sockets and their applications.
c) Java, JVM and advantages of Java.
d) Importance of security, privacy in Network/Internet applications.

✪✫✪✫

[3766] - 56
T.Y. M.C.A. (Engineering)
ENTERPRISE RESOURCE PLANNING
(2005 Course) (315005)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates:

    1)   *Answer three questions from each section.*

    2)   *Answers to the two sections must be written on separate answer books.*

    3)   *Assume suitable data if necessary.*

    4)   *Draw sketches wherever necessary.*

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

SECTION - I

Q1)   a)   What is an enterprise? What is ERP? What are the facilities, which form "multi-facility" environment of ERP?   **[9]**

      b)   What are benefits of ERP?   **[8]**

OR

Q2)   a)   Discuss about various resources that ERP needs to manage? Enlist the application domains where ERP can be implemented.   **[9]**

      b)   Is ERP an asset? Why? Explain it with suitable examples.   **[8]**

Q3)   a)   What is organizational structure? How can it affect the development of ERP system?   **[9]**

      b)   How are the major challenges related with change management handled while developing ERP system?   **[8]**

OR

Q4)   a)   How are organizational requirements vital in development of ERP system?   **[9]**

      b)   Why are users reluctant for implementation of ERP system? How should one deal with such user resistance?   **[8]**

Q5) a) Compare any other available ERP product with SAP R/3. **[8]**

b) What are major infrastructure requirements for implementation of ERP system for a bank providing financial services? **[8]**

OR

Q6) a) Enlist and discuss the critical success factors for ERP system. **[8]**

b) Why do ERP systems fail? Are there any remedies on failures? **[8]**

SECTION - II

Q7) a) Explain the selection process and related criteria for ERP packages.**[9]**

b) Evaluate the ERP development strategies : - In-house development vs. Outsourcing. **[8]**

OR

Q8) a) What are different design and customization issues which may be addressed during development of ERP solution? **[9]**

b) Evaluate the ERP development strategies : - Off the shelf vs. Development of ERP solution. **[8]**

Q9) a) What is Business Process Re-engineering (BPR)? Explain role of IT in implementation of it. **[9]**

b) How are ERP systems differentiated in global contexts? Discuss it with suitable examples. **[8]**

OR

Q10) a) How can CRM, SCM and data warehousing be integrated with ERP systems? **[9]**

b) Why is there a need to understand the markets to implement ERP solution? **[8]**

Q11) Write short notes on :

a) Quality Control with ERP systems. **[8]**

b) Gap Analysis. **[8]**

OR

Q12) Write short notes on :

a) Technology Management & ERP. **[8]**

b) ERP sales cycle. **[8]**

✪✧✪✧

[3766] - 304

M.C.A. (Engg.)
COMPUTER COMMUNICATIONS AND NETWORKS
(2008 Course) (Sem. - III) (610904)

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

Instructions to the candidates:
 1) *All questions are compulsory.*
 2) *Answer should be written in separate section.*
 3) *Figures to the right indicate marks.*

SECTION - I

Q1) a) List the parameter on which the performance of network depends. **[4]**

 b) Explain different types of transmission modes.   **[8]**

OR

Q2) a) List the different categories of multiplexing and also explain Synchronous time division multiplexing.   **[8]**

 b) Explain microwaves with Horn Antenna.   **[4]**

Q3) a) Differentiate the Circuit switch network, datagram network and Virtual switch network W.R.T.
   i) Delay.
   ii) Efficiency.
   iii) Their Application.   **[8]**

 b) Explain Cross Bar Switch.   **[4]**

OR

Q4) a) Explain Challenge Handshake Authentication Protocol (CHAP). Also draw a diagram showing how CHAP Packet is encapsulated in PPP frame.   **[8]**

 b) Explain Piggybacking in a Go-Back-N ARQ.   **[4]**

Q5) a) Write short note on Gigabyte Ehernet. **[5]**

b) Explain the CSMA/CD protocol with binary exponential back off algorithm used In Internet. **[6]**

<center>OR</center>

Q6) a) Explain ATM header format for UNI and NNI cell. **[6]**

b) Draw the flow diagram for CSMA/CD. **[5]**

<center>

SECTION - II

</center>

Q7) a) Explain the congestion prevention policies. **[6]**

b) Given three IP addresses are 32.46.7.3, 200.132.110.35 and 140.75.8.92. Find their classes, network addresses, broadcast address and their subnet marks. **[6]**

<center>OR</center>

Q8) a) Explain DHCP? Also explain handshaking signals exchange between DHCP server and Client. **[6]**

b) Explain IGMP with its message formats. **[6]**

Q9) a) Explain Connection establishment using three way handshaking in TCP. **[8]**

b) Write short note on stream Control Transmission Protocol (SCTP).**[4]**

<center>OR</center>

Q10) a) Explain TCP segment format. **[8]**

b) Explain Timer management in TCP. **[4]**

Q11) a) Explain DNS in Internet. **[6]**

b) Explain Browser architecture. **[5]**

<center>OR</center>

Q12) a) Explain E-mail Architecture. **[6]**

b) Write difference between FTP and TFTP. **[5]**

<center>✪✫✪✫</center>

P1582

[3766] - 405
Second Year M.C.A. (Engineering)
ORGANIZATION BEHAVIOR
(2008 Course) (610913) (Elective - I)

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

Instructions to the candidates:
  1)   *Answers to the two sections should be written in separate books.*
  2)   *Neat diagrams must be drawn wherever necessary.*
  3)   *Figures to the right indicate full marks.*
  4)   *Assume suitable data, if necessary.*
  5)   *All questions are compulsory.*

SECTION - I

Q1) a) i)   Explain in brief Autocratic Model of Organizational Behavior. **[6]**

         ii) Explain in brief primary dependent and independent variables in
              general model of OB, presented by Robbins.   **[6]**

                                    OR

      b) i)   Explain motivation process along with content and process model
              of motivation.   **[6]**

         ii) In detail explain Goal setting and Reward system.   **[6]**

Q2) a) i)   Explain Douglas McGregor's theory 'X' and 'Y'.   **[6]**

         ii) Explain Fredrick Herzberg's two factor theory of motivation. **[6]**

                                    OR

      b) i)   What are the ill-effects of stress on human? Explain management
              of stress in brief.   **[6]**

         ii) Explain the relationship of Morale to Productivity.   **[6]**

Q3) a) i)   How performance appraisal helps in overall development of an
              employee and organization.   **[6]**

         ii) How the team effectiveness helps in overall development of an
              organization.   **[5]**

                                    OR

      b) i)   Explain how to handle levels of conflicts within an organization.**[6]**

         ii) Which factors influence the human resource planning in
              Organization.   **[5]**

                                                                           P.T.O.

1

SECTION - II

Q4) a) i) Define Leadership and explain importance of leadership to the organization. **[4]**

ii) Write short note on : **[8]**

1) Black and Moutan's theory.

2) Organizational design.

OR

b) i) Write short note on : **[8]**

1) Organizational climate.

2) Organizational culture.

ii) Which are the trait, behavioral and situational approaches for leader ship style. **[4]**

Q5) a) i) Which are the constructive conflicts and what are the strategies for conflict resolution. **[6]**

ii) List the forces responsible for change. **[5]**

OR

b) i) Write short note on : **[8]**

1) Conflict management.

2) Conflict process.

ii) How the change within an organization leads to the effective development of an organization. **[3]**

Q6) a) i) What is Quality in turn of an organization? What is Total Quality management? Which are the techniques for TQM? **[8]**

ii) What is relation of re-engineering with empowerment? **[4]**

OR

b) Write short note on : **[12]**

i) Re-Engineering.

ii) Bench marking.

iii) Learning Organization.

iv) Benefits of TQM.

✪✫✪✩

P1582

[3766] - 405

Second Year M.C.A. (Under Faculty of Engineering)
HUMAN COMPUTER INTERFACE
(2008 Course) (Sem. - IV) (610913) (Elective - I)

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

Instructions to the candidates:

   1)   *Answer question 1 or 2, 3 or 4, 5 or 6 from Section - I and Question 7 or 8, 9 or 10 and 11 or 12 from Section - II.*

   2)   *Answers to the two sections should be written in separate books.*

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

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

   5)   *Assume suitable data, if necessary.*

SECTION - I

Q1)   a)   What do you mean by direct-control and indirect-control pointing devices? Explain minimum two examples of each. **[8]**

      b)   Compare STM and LTM of human with respect to capacity, access time and forgetting. **[3]**

OR

Q2)   a)   Compare and contrast motivating factors between life critical systems and those for home, office or entertainment. **[5]**

      b)   What is reasoning? Explain different types of reasoning with example. **[6]**

Q3)   a)   Using "Eight golden rules of interface design" evaluate Microsoft Word interface. **[8]**

      b)   List different interaction styles. What are the advantages and disadvantages of Direct manipulation? **[4]**

OR

Q4)   a)   Create a GOMS description of the task of 'Closing a window'. Use 'pressing ctr-w keys' and 'close option of file menu' methods. Assume hand starts on mouse. Using KLM explain which of the above method is more suitable for expert users. **[8]**

      b)   Explain "Gulf of execution" and "Gulf of evaluation". **[4]**

P.T.O.

Q5) Describe Logical User Centered Interactive Design Methodology (LUCID). **[12]**

OR

Q6) a) Explain different tools for screen layout with example. **[8]**

b) What do you mean by affordance? Explain it with any two examples.**[4]**

SECTION - II

Q7) a) Write a short note on Expert reviews. **[8]**

b) Minimal manuals have been proposed as a means of helping users to get started with interactive systems. Instead of relying on large documents with hundreds of pages of detailed references, users are given a short summary of the initial functionality. Briefly describe how you would design an interface so that users could gradually learn more about a system once they had become familiar with the content in the minimal manual. **[4]**

OR

Q8) a) Describe design guideline and the use of combo-box, list-box and coded fields in designing of a form. Design a form to take student information on university website. Student information may consist of name, middle name, last name, mother's name, address (corresponding & permanent), date of birth, telephone number, e-mail address, college, department, year etc. **[8]**

b) Explain different command organization strategies. **[4]**

Q9) Discuss advantages and disadvantages of online manuals. Also discuss the facilities that can be provided in online manuals which might not be practical in printed manuals. **[11]**

OR

Q10) a) Explain in brief any three applications of hypermedia. **[6]**

b) What do you mean by CSCW? What is asynchronous interactions and face to face communication in CSCW? Explain with example. **[5]**

Q11) What input and output devices would you use for the following systems? For each, compare and contrast alternatives, and if appropriate indicate why the conventional keyboard, mouse and CRT screen may be less suitable.

    a)   Portable word processor.

    b)   Tourist information system.

    c)   Air traffic control system.

    d)   Worldwide personal communication system.   **[12]**

<div align="center">OR</div>

Q12) a)   Write a short note on : Information visualization.   **[8]**

    b)   What factors are likely to delay the widespread use of video in interface? What applications could benefit most from its use?   **[4]**

<div align="center">✪ ✫ ✪ ✫</div>

P1625

[3766]-44

S.Y. M.C.A. (Engineering)
ORGANIZATION BEHAVIOR
(2005 Course) (215012)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Answers to the two sections should be written in separate answer books.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right indicate full marks.*
5) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) i) Explain in brief SOBC Model of Organizational Behavior. **[8]**

ii) Explain in brief primary dependent and independent variables in general model of OB, presented by Robbins. **[10]**

OR

b) i) Explain in brief custodial and supportive Model of Organizational Behavior. **[10]**

ii) In detail explain Goal setting and Reward system. **[8]**

Q2) a) i) Explain Douglas McGregor's theory 'X' and 'Y'. **[8]**

ii) Explain Vector Vroom's expectancy theory of motivation in detail.**[8]**

OR

b) i) Which are the defence mechanism for interpersonal conflict frustration? Which are the different types of motives? **[10]**

ii) Explain the relationship of Morale to Productivity. **[6]**

Q3) a) Write short note on : **[16]**
i) Team effectiveness.
ii) Conflict management.
iii) Human resource management.
iv) Team development.

OR

P.T.O.

b) i) Explain how to handle levels of conflicts within an organization. **[8]**

ii) Which factors influence the human resource planning in an Organization. **[8]**

SECTION - II

Q4) a) i) Define Leadership and explain importance of leadership to the organization. **[8]**

ii) Write short note on : **[10]**
1) Hersey and Blanchard's theory.
2) Organizational design.

OR

b) i) Write short note on : **[12]**
1) Organizational climate.
2) Organizational culture.

ii) Explain various organizational structure. **[6]**

Q5) a) i) Which are the constructive conflicts and what are the strategies for conflict resolution. **[8]**

ii) Explain conflict process with an example. **[8]**

OR

b) i) Write short note on : **[8]**
1) Conflict management.
2) Resistance to change.

ii) How the change within an organization leads to the effective development of an organization. **[8]**

Q6) a) Write short note on : **[16]**
i) Learning Organization.
ii) Benefits of TQM.
iii) Downsizing.
iv) Various quality aspects.

OR

b) What is Total Quality management? Which are the techniques for TQM? What is relation of re-engineering with empowerment? **[16]**

✳ ✳ ✳

P1626

[3766]-401

S.Y. M.C.A. (Engineering)
SOFTWARE ENGINEERING
(2008 Course)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates:

1) *Answer any three questions from each section.*
2) *Answers to the two sections should be written in separate books.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right indicate full marks.*
5) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) Explain in detail the various phases of the unified process.   **[6]**

b) Explain in detail all the levels of CMMI with key process area. What is Process Assessment? Explain with suitable diagram?   **[6]**

c) Explain in detail process pattern. What is the relationship between process and product?   **[5]**

OR

Q2) a) Explain the generic process framework activities.   **[5]**

b) Explain with neat diagram the prototyping model for software development what are applied throughout the software process.   **[6]**

c) Explain the umbrella activities which are applied throughout the software process.   **[6]**

Q3) a) With a neat example and diagram explain Hately-Pirbhai modeling. What is the role of architecture flow diagram in developing system flow diagram.   **[7]**

b) What do you mean by Principle? List and explain in short :   **[6]**
   i)   Communication Practices.
   ii) Planning Practice.

c) How system modeling is achieved using UML. What is the purpose of activity diagram?   **[4]**

OR

Q4) a) Explain data Architecture, application Architecture and technology infrastructure as part of Business Process Engineering? **[7]**

b) Explain System Engineering Hierarchy with neat labeled diagram. **[6]**

c) What is meant by Domain Analysis. Explain. **[4]**

Q5) a) What are the goals of Requirement Engineering? What are the tasks performed in requirement engineering? **[8]**

b) What is Behavior Modeling? Draw a sequence diagram for at least two scenario's for account holder Transaction with Bank. Assume suitable scope and indicate it. **[8]**

OR

Q6) a) What are the various elements of Use Case template? **[4]**

b) Explain concept of empty classes and boundary classes for Banking System? Give example of one entity class and one boundary class. **[4]**

c) What are the various elements of Use case template? **[4]**

d) Explain in detail, Class Responsibilities Collaborator (CRC) modeling. **[4]**

SECTION - II

Q7) a) What is the importance of software design? What is the relation between analysis and design? What are types of design classes? **[9]**

b) What are the golden rules of interface design? Explain in detail all the rules. **[8]**

OR

Q8) a) Explain data design at component level with all the principles for data specification. Explain the following architectural style with merits/demerits: **[8]**

i) Data-centered Architecture.
ii) Data-flow Architecture.

b) What is meant by cohesion and coupling criteria's that address the function Independence. List all the types of cohesion. **[9]**

Q9) a) What categories of errors are traceable using Black-Box testing? Explain in detail following Black-Box testing method : **[9]**

i) Equivalence partitioning.
ii) Boundary value analysis.
iii) Orthogonal Array testing.

b) What are strategic issues in software testing? Explain in detail? **[8]**
   i) Top-down integration testing.
   ii) Bottom-up integration testing.

<center>OR</center>

Q10) a) What are the objectives of testing? What are testing strategies for conventional and object-oriented software. **[8]**

b) What are concern for system testing? What are the ways to perform system testing? **[9]**

Q11) a) What is software quality? What are the factors affecting software quality? What are the mechanisms to address quality software? **[8]**

b) What are the objectives of software Maintenance? Explain in detail maintenance metrics. **[8]**

<center>OR</center>

Q12) a) What do you mean by the term : measure, measurement and metrics. List and measurement process activities. What are the attributes of effective software metric. List the metric for analysis and design model.**[8]**

b) Explain in detail function point metric. List all the value adjustment factors. What are the metric for specification quality? **[8]**

<center>✳ ✳ ✳</center>

[3766]-402
Second Year M.C.A. (Engineering)
WEB TECHNOLOGY
(2008 Course) (610910)

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

Instructions to the candidates:
  1) *Figures to the right indicate full marks.*
  2) *Answers to two sections should be written in separate answer books.*
  3) *From Section-I, answer (Q.1 or Q.2) and (Q.3or Q.4) and (Q.5 or Q.6).*
  4) *From Section-II, answer (Q.7 or Q.8) and (Q.9or Q.10) and (Q.11 or Q.12).*
  5) *Make suitable assumptions wherever appropriate and relevant.*

<u>SECTION -I</u>

Q1) a) State whether the following are True or false :   **[2]**

  i) "A browser may or may not establish a TCP connection with a Web server before it sends an HTTP request".

  ii) "A proxy server is used to transform TCP/IP protocol to HTTP format."

  b) Comment on and explain :

  i) "HTTP is a stateless protocol".

  ii) "TELNET can actually be used to send HTTP commands to a web server."   **[6]**

  c) Discuss the 3-tier architecture for any modern web application.   **[4]**

<div align="center">OR</div>

Q2) a) Explain in details, stepwise execution of Dynamic Web Pages with suitable example and appropriate flow diagram.   **[6]**

  b) What are the three approaches for e-commerce application development?
                                                                        [6]

Q3) a)   Create a static HTML page that displays the following list of items : **[8]**

Item Code	Item Name	Price	Discount
01	Pencil	05	1.0%
02	Pen	20	1.5%
03	Note book	40	2.0%
04	Diary	80	2.25%

b)   What is the advantage of document-level style sheets over inline style sheets? What is the format of an external style sheet?   **[3]**

OR

Q4) Create an HTML document that describes nested ordered lists of cars. The outer list must have three entries: compact, midsize, and sports. Inside each of these lists there must be two sub-lists of body styles. The compact and midsize car sub-lists are two doors and four doors; the sports car sub-lists are coupe and convertible. Each body style sub-list must have at least three entries, each of which is the make and model of a particular car that fits the category. The outer list must use uppercase Roman numerals, the middle lists must use uppercase letters, and the inner lists must use Arabic numerals. The background color for the compact car list must be pink; for the mid size car list, it must be blue; for the sports car list, it must be red. **All of the styles must be in a document style sheet.**   **[11]**

Q5) a)   Describe how a web server can be made dynamic.   **[4]**

b)   Explain in details, the program execution of the following code?   **[4]**

```
<html>
    <body>
    <script type="text/vbscript">
    Randomize( )
    randomNumber=Int(100 * Rnd( ))
    document. write("A random number: <b>" & randomNumber & "</b>")
</script>
</body>
</html>
```

c)   Explain with example primitive data types of VbScript.   **[4]**

OR

Q6) a) What are the main differences between : **[4]**

   i)   ActiveX Controls and Applets?

   ii) ASP and JSP.

b) Explain in details, the program execution of the following code : **[4]**

```
<html>
    <body>
    <script type="text/vbscript">
      fname= " Bill "
      document. write("Hello" & Trim(fname) & "Gates<br/>")
      document. write("Hello" & RTrim(fname) & "Gates<br/>")
      document. write("Hello" & LTrim(fname) & "Gates<br/>")
    </script>
    </body>
</html>
```

c) Explain the two kinds of procedures in VBScript. **[4]**

SECTION - II

Q7) a) Discuss all three approaches to addressing an HTML form element in JavaScript. Also state the disadvantages of first two approaches. **[6]**

b) Describe all of the differences between the three possible values of the position property. **[6]**

OR

Q8) a) Describe the Click, focus, load and submit events with their Attributes and Tags. **[6]**

b) Explain the three phases of event processing in the DOM2 event model. **[6]**

Q9) a) Why was JSP required? Describe the life cycle of a JSP. **[5]**

b) What is Ajax? Describe Ajax Web Application Model. How it is different from traditional web application model? **[6]**

OR

*Q10)*a) Discuss any two client-server communication Ajax techniques in details.
[6]

b) Write a program in JSP to print addition and subtraction of a two variables using HTML tags? **[5]**

*Q11)*a) Explain any three key features provided by each of the following : **[6]**

i) HTML Server Controls.

ii) Web controls.

b) How many types of validation controls are provided by ASP.NET? **[6]**

OR

*Q12)*Write short notes on : **[12]**

a) .NET framework.

b) Global.asax file.

c) ADO.net.

d) Basic web control classes.

# # # #

P1227   **[3766]-11**

M.C.A. (Engineering Faculty)
Problem Solving and Programming in C
(115001) (2005 Course)

Time : 3 Hours]   [*Max. Marks : 100*

Instructions to the candidates:
  1) *Answer any three questions from each section.*
  2) *Answers to the two sections should be written in separate answer books.*
  3) *Neat diagrams must be drawn wherever necessary.*
  4) *Figures to the right indicate full marks.*
  5) *Assume suitable data, if necessary.*
  6) *Steps of Hand running must be shown wherever output of the program is asked.*

SECTION - I

Q1) a) How we can choice appropriate data structures for formulating computer solutions to problems? **[6]**

  b) Design an algorithm to compute the averaging a list of nonnegative numbers. **[6]**

  c) Design an algorithm to convert binary numbers to decimal. **[6]**

OR

Q2) a) What are the qualities and capabilities of any good algorithm? **[6]**

  b) Design an algorithm that counts the number of digits in an integer.**[6]**

  c) Design an algorithm that reads an integer and then prints the largest Fibonacci number less than this integer. **[6]**

Q3) a) Distinguish between the following with an example **[8]**
  (i) do ...while and while loop
  (ii) while and for loop

  b) Describe the output that will be generated by following C programs.**[8]**
  (i) #include<stdio.h>
     int main()
     {
       int i=0, x=0;
       for (i=1; i<10; i*=2)
       {

```
            x++;
            printf("%d",x);
        }
        printf("\n x=%d",x);
        return 0;
    }
```

(ii)
```
#include<stdio.h>
int funct (int count);
int main()
{
    int a, count;
    for (count=1; count<=5; ++ count)
    {
        a=funct (count);
        printf("%d\n", a);
    }
}
    int funct(int x)
    {
        int y;
        y=x*x;
        return y;
    }
```

OR

Q4) a) Explain various string library functions used in C with suitable example. **[8]**

b) Write a C program which reads a string and then prints number of Vowels and Consonants in it. **[8]**

Q5) a) What will be the output of the following program? Justify your answer. **[8]**

(i)
```
#include<stdio.h>
int main()
{
    char a[]="string", *p="string";
    printf("%c %c",1[a], 1[p]);
    return 0;
}
```

(ii) #include<stdio.h>
```
int main()
{
    int *a=(1,2,2,2,2), *p;
    p=(int*) malloc(10);
    printf("%P %p\n", a, p);
    return 0;
}
```

b) Write a C program using pointers to accept two matrices from the user and perform addition of given matrices. **[8]**

OR

Q6) a) (i) Differentiate between realloc() and malloc() function in C. **[8]**

(ii) Explain the purpose of each of the following declarations
1. int *p[10];
2. int (*p) [10];
3. int p (char *a);
4. int *p (char *a);

b) Write a C program using pointers to read an array of integers and prints its elements in descending order. **[8]**

SECTION - II

Q7) a) Distinguish between union and structure. For what kinds of applications are unions useful? **[4]**

b) Explain with suitable examples self referencing structure. **[6]**

c) Explain nesting of structure with suitable example. Can union be member of Structure and structure be a member of union? If yes, give suitable example. **[8]**

OR

Q8) a) What it meant by an array of structures? Explain with suitable example. **[4]**

b) Explain how to pass entire structure as parameter to function and how to return a structure from function. **[6]**

c) Define a structure called Inventory that will describe following information: **[8]**
    i) Item_No
    ii) Item_Name
    iii) Unit_Price

iv) Quanitity_Recieved

v) Current_Count

vi) Supplier_Name

vii) Purchase_Date

Purchase_Date is member of another 'Date' structure.

Using Inventory create array of items and write a C program to read the information about all items. While displaying final list calculate and display the purchase price for each shipment. Sort the list in ascending order of Item_No.

Q9) a) Write a C program to count number of spaces on each line of text in a file. **[8]**

   b) Explain the following file handling functions in C with suitable example: **[8]**

   i) feof()   ii) ferror()   iii) fseek()   iv) ftell()

OR

*Q10)*a) Write a difference between text mode and binary mode. **[8]**

   b) Write a C program to read integer number from user and display it in binary format using bitwise operator. **[8]**

*Q11)*a) Apply Newton Raphson Method to solve the equation $x - e^{-x} = 0$ correct up to 5 places of decimals. **[8]**

   b) Explain Gauss Seidal method. **[8]**

OR

*Q12)*a) Explain the following: **[8]**

   i) Forward and backward substitution

   ii) Partial pivoting in Gauss Elimination method.

   b) Evaluate $\int_{0}^{6} \frac{dx}{(1+x)}$ by Simpson's 3/8th rule. **[8]**

□□□□

P1228   **[3766]-13**

F.Y. M.C.A. (Under Engg.)
Foundations of Information Technology (115003)
(2005 Course)

Time : 3 Hours]   [*Max. Marks : 100*

Instructions to the candidates:
- *1)* *Answer any three questions from each section.*
- *2)* *Answers to the two sections should be written in separate books.*
- *3)* *Figures to the right indicate full marks.*
- *4)* *Assume suitable data, if necessary.*

SECTION - I

Q1) a) What is data processing? Differentiate between data and information. Which one is more useful? Justify. **[6]**

b) Convert $(4052)_{16} = ($? $)_{10}$

$(11011)_2 = ($? $)_{10}$. **[5]**

c) What are five basic operations of computer system? **[5]**

OR $+ \bar{x}y$

a) Differentiate between the characteristics of primary and secondary storage of computers. **[6]**

b) Simplify following Boolean Function to minimum number of literals.**[5]**

i) $\bar{x}\,\bar{y}z + \bar{x}y \cdot z + x\bar{y}$

ii)

c) Describe the role of components of CPU. **[5]**

Q2) a) List out the major steps involved in the execution of instruction. **[6]**

b) Define Terms : Multitasking, multiprocessing and multiprogramming with examples. **[5]**

c) What role do I/O devices play list example I/O devices. **[5]**

OR

a) List out the main uses of magnetic tape. **[6]**

b) Describe in brief printing mechanism of laser printer. **[5]**

c) Define Terms nibble, byte, word, bit. **[5]**

P.T.O.

Q3) a) Explain the importance of system software for a computers. **[6]**

b) What is Software Engineering? What are major phases? **[6]**

c) What do you mean by language of computer? What is compiler? What is its importance? **[6]**

OR

a) What are desirable characteristics of good programming language?**[6]**

b) What do you mean by machine language and assembly language? What is higher level language? **[6]**

c) Differentiate i) Compiler and Interpreter.

ii) Macro and function. **[6]**

SECTION - II

Q4) a) What is operating system? What are its main functionalities? **[6]**

b) What is Time slicing and Time sharing? **[5]**

c) What is word processing? Is Word processor a Application or system software? **[5]**

OR

a) What is process in computer system? What is main objective of process management. **[6]**

b) What are major parameters to measure performance of computer? **[5]**

c) What are commonly supported features of graphics package? **[5]**

Q5) a) What are key roles played by memory management module of Operating system? **[6]**

b) What is multimedia? Explain with the help of example. **[6]**

c) What are the operations involved in the change over process? **[6]**

OR

a) Give some examples of multimedia applications in education and entertainment. **[6]**

b) What do you mean by testing and debugging? **[6]**

c) What are the two standard methods used in data processing system for organizing data? **[6]**

2

Q6) a) What is www? What is Internet? What are major advantages of both?**[6]**

b) Define terms:

i) Networking   ii) URL   iii) TCP/IP   iv) UDP   **[4]**

c) Define with examples : simplex, half duplex and full duplex modes of Data transmission.   **[6]**

OR

a) List out some of the advantages and disadvantages of email service against telephone service.   **[6]**

b) Differentiate between

i) Leased line   ii) Dial up connection.   **[4]**

c) What is packet switching? Why is this method used for digital data communication?   **[6]**

▢▢▢▢

P1236   **[3766]-52**

Third Year M.C.A. (Engineering Faculty)
COMPUTER GRAPHICS
(315002) (Sem. - I) (2005 Course)

Time : 3 Hours]   [*Max. Marks : 100*

Instructions to the candidates:

   1)   *Answers to the two sections should be written in separate answer books.*

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

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

   4)   *Assume suitable data, if necessary.*

SECTION - I

Q1) a)   Write short note on: **[9]**

        i) Scanner   ii) Digitizer   iii) Touch panel

    b)   Explain DDA circle drawing algorithm in detail.   **[8]**

                             OR

Q2) a)   Explain Random scan display and Raster scan display.   **[4]**

    b)   Explain Bresenham's line drawing algorithm. Using Bresenham's algorithm draw line from (1, 1) to (5, 3).   **[10]**

    c)   Define following terms: **[3]**

        i) Pixel   ii) Refresh rate   iii) Display file interpreter.

Q3) a)   Consider square A(0, 0), B(0, 10), C(10, 10), D(10, 0). Rotate the square about fixed point R(10, 10) by an angle 45° counter clockwise followed by uniform scaling by 2 units.   **[8]**

    b)   Explain cancave and convex polygons. Write pseudo-c algorithms for 8-connected boundry fill algorithm.   **[9]**

                              OR

Q4) a)   Why there is need of Inverse transformation? Derive matrix for Inverse transformation.   **[8]**

    b)   Explain different methods for testing a pixel inside of polygon.   **[6]**

    c)   Explain Run length encoding.   **[3]**

Q5) a) What is segment? Explain segment table and how to perform delete operation on segment. **[8]**

b) Explain Sutherland-Hodgman polygon clipping algorithm. **[8]**

OR

Q6) a) Explain any two text clipping techniques. **[4]**

b) Explain viewing transformation in detail. **[8]**

c) Explain how is segmentation used in Animation. **[4]**

SECTION - II

Q7) a) Explain parallel projections in detail with transformation matrix. **[8]**

b) Obtain 3-Dimensional transformation matrices for **[9]**

i) Translation   ii) Scaling   iii) Rotation about an orbitrary axis.

OR

Q8) a) Explain the 3-D viewing process with various 3-D viewing parameters. **[8]**

b) What is the necessity of 3D clipping and windowing algorithm? Explain any one 3-D clipping algorithm. **[9]**

Q9) a) Explain binary space partition algorithm for hidden surfaces. **[8]**

b) Why hidden surface algorithms are needed? How does Z-buffer algorithm determines which surfaces are hidden? **[9]**

OR

Q10) a) Describe:- **[8]**
i) Diffused illumination.
ii) point source illumination.

b) Write short note on :- **[9]**
i) Shadow   ii) Transparency   iii) Ray tracing

Q11) a) Explain different methods for controlling animation. **[6]**

b) Define fractal. Give any two examples of fractals. **[6]**

c) Why is cubic form choosen for representing curves? **[4]**

OR

Q12) a) Explain real-time animation with color tables. **[8]**

b) What is interpolation? Explain Lagrangian interpolation method. **[8]**

□□□□

P1237   **[3766]-53**

Third Year M.C.A. (Engineering)
Advanced Databases
(315003) (Sem. - I) (2005 Course)

Time : 3 Hours]   [*Max. Marks : 100*

Instructions to the candidates:

   1)   *Answers to the two sections should be written in separate books.*

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

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

   4)   *Assume suitable data, if necessary.*

SECTION - I

Q1) a)   With suitable diagram explain the steps in query processing.   **[6]**

   b)   Explain how the Pipelines are executed.   **[5]**

   c)   Explain basic scan algorithms to implement selection operation in query
        processing.   **[6]**

                                   OR

Q2) a)   What are the measures of query cost?   **[5]**

   b)   Explain and compare nested loop join and block nested loop join
        algorithm.   **[6]**

   c)   Explain the search algorithm that make use of index.   **[6]**

Q3) a)   Explain parallel database architectures.   **[8]**

   b)   State the advantages and disadvantages of distributed system.   **[5]**

   c)   Write short note on : Data servers.   **[4]**

                                   OR

Q4) a)   Explain centralized and client server database architectures. **[6]**

   b)   Explain transaction server system in detail.   **[8]**

   c)   Compare and contrast speedup and scaleup.   **[3]**

Q5) a)   Explain structured types and inheritance with example in SQL.   **[8]**

   b)   Explain the different approaches used for making an object persistent.**[8]**

                                   OR

Q6) a) Explain object identity and reference types with example. **[8]**

b) What is persistent programming language and how it is different from embedded language? **[8]**

SECTION - II

Q7) a) What is the major difference between the snowflake and star schema models? **[4]**

b) Explain any two operations on data cubes. **[4]**

c) What is meant by Data cleaning? Name the different methods for handling the missing values. Explain them in brief. **[9]**

OR

Q8) a) Define the following terms with respect to Data Cube: **[3]**
   i)   Dimension table
   ii) Fact table
   iii) Base Cuboid

b) Explain any two data smoothing techniques. **[6]**

c) Write short notes on: **[8]**
   i)   Fact Constellation
   ii) Need for preprocessing data.

Q9) a) What is the role of data mining in knowledge discovery process? **[2]**

b) Explain the following terms with respect to Apriori algorithm. **[9]**
   i)   Apriori property
   ii) Join action
   iii) Prune action.

c) Write short notes on : **[6]**
   i)   Bayesian classifiers
   ii) Machine Learning.

OR

*Q10)*a) What is meant by classification? With a suitable example explain the concept of Decision Tree. **[6]**

b) Differentiate between Data Mining and OLAP. **[3]**

c) Write short notes on: **[8]**
   i)   K-means algorithm
   ii) Outlier analysis.

2

Q11)a) Explain the following terms with respect to Information retrieval: **[6]**
  i)   Hub
  ii) Authority
  iii) Search engine spamming.

  b) Explain the concept of Page Rank. **[4]**

  c) Explain in the detail Web Search Engines. **[6]**

<div align="center">OR</div>

Q12)a) Explain the following terms related to similarity-based retrieval. **[6]**
  i)   Relevance feedback
  ii) Cosine similarity
  iii) Vector space model.

  b) What is the basic idea behind the popularity ranking? Explain in detail. **[8]**

  c) What do you meant by ontologies? **[2]**

<div align="center">□□□□</div>

3

P1244   **[3766]-403**

S.Y. M.C.A. (Engineering)
Object Oriented Analysis and Design
(Sem. - IV) (2008 Course)

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

Instructions to the candidates:

1) *Answers to the two sections should be written in separate books.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) What is 4+1 view architecture view? Describe advantages of focusing on each of the view of the system. **[4]**

b) Write short note on CORBA services. **[4]**

c) Define the terms : Iteration, Increment, Inheritance, Object. **[4]**

OR

Q2) a) Draw diagram for RUP. **[4]**

b) Explain in brief new features of UML 2.0. **[4]**

c) What is the relevance of Inception and Construction phase in Rational Unified Process? **[4]**

Q3) a) Explain the tagged value concept in UML and also its need. **[2]**

b) Write a short note on UML meta model. **[4]**

c) Why does one need use case diagram? Explain with example. **[6]**

OR

Q4) a) What is OCL? **[2]**

b) List the name of structural and behavioural diagram. **[4]**

c) Write a short note on "Extensibility mechanism in UML". **[6]**

Q5) a) Explain polymorphism and encapsulation with example. **[5]**

b) What do you understand by concept of interface? How does it encourage better maintenance? **[6]**

P.T.O.

Q6) a) Describe with example advanced relationship. **[6]**

b) Explain "CRC Card used in analysis phase". **[5]**

SECTION - II

Q7) a) Give any example for timing constraint in a sequence diagram. **[5]**

b) Discuss the concept of signal. **[3]**

c) What is the purpose of interaction diagram. **[4]**

OR

Q8) a) Draw a communication diagram for 'schedule a seminar' in hypothetical college system for seminar management. Make suitable assumption about the scope. **[5]**

b) Discuss the concept of exception. **[3]**

c) Compare sequence and communication diagram in four counts namely Visual emphasis, freedom to represent objects information, the way Sequencing is shown, the way iteration/looping is shown. **[4]**

Q9) a) Describe elements and notation use to build an activity diagram in UML. **[4]**

b) Explain fork and join. **[4]**

c) What are the different parts of state in state machine? **[4]**

OR

*Q10)*a) Compare concepts : state and activity. **[4]**

b) Write a short note on timing diagram. **[4]**

c) Define source state and target state. **[4]**

*Q11)*a) Write a short note on packaging diagram. **[3]**

b) What are the application of UML in embedded system? **[4]**

c) What are the common uses of component diagram? **[4]**

OR

*Q12)*a) Describe the notations used in deployment diagram. **[3]**

b) What are the UML commercial applications. **[4]**

c) Draw a deployment diagram for the following application. A full fledged website is to be hosted for your college. Make suitable assumption. **[4]**

P1290   **[3766]-23**

M.C.A. (Under Engineering)
OPERATIONS RESEARCH
(115011) (Sem. - II) (Old Course)

Time : 3 Hours]   [*Max. Marks : 100*

Instructions to the candidates:
   1) *All questions are compulsory.*
   2) *Answers to the two sections should be written in separate answer books.*
   3) *Figures to the right indicate full marks.*
   4) *Use of electronic pocket calculator is allowed.*
   5) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) A company can produce two products A and B. Each product has to be processed by three machines X, Y and Z.

   Machine X can be operated for a total time of 2700 minutes. It takes 11 minutes for an item A and 5 minutes for an item B. Machine Y can be operated for 2000 minutes and it takes 5 minutes for an item A and 10 minutes for B. Machine Z can be operated for total time of 450 minutes and it takes 1 minute for A and 2 minutes for B.

   The profit per item of A is Rs. 10 and per item of B is Rs. 15. Find the number of units of A and B to be produced so as to maximise the profit. **[8]**

   b) Solve the following LPP by Simplex Method.

   Maximize

   $$Z = 45x_1 + 55x_2$$

   Subject to

   $$6x_1 + 4x_2 \leq 120$$
   $$3x_1 + 10x_2 \quad 180$$
   $$x_1, x_2 \quad 0$$ **[10]**

   OR

   a) Give the General structure of LP model. What are the advantages and limitations of LP model. **[8]**

P.T.O.

1

b) Explain the following terms in LPP. **[10]**

   i) Feasible solution.

   ii) Optimum solution.

   iii) Slack variable.

   iv) Objective function.

   v) Constraints.

Q2) a) Determine an initial basic feasible solution using

   i) North-West corner method.

   ii) Least cost method.

   iii) Vogel's approximation method. For the following transportation problem in order to minimize the total transportation cost. **[9]**

Factories	Warehouse				Capacity
	W_1	W_2	W_3	W_4	
F_1	30	25	40	20	100
F_2	29	26	35	40	250
F_3	31	33	37	30	150
Requirements	90	160	200	50	500

b) Explain the steps used in the 'Hungarian Assignment Method'. Why Assignment problem is regarded as a special case of transportation problem? **[7]**

OR

a) Explain MODI method to find optimum solution of transportation problem. **[8]**

b) Solve the following assignment problem for maximizing the profit.

[8]

	A	B	C	D	E
1	62	78	50	101	82
2	71	84	61	73	59
3	87	92	111	71	81
4	48	64	87	77	80

2

Q3) a) Explain the terms: **[6]**

i) Optimistic time.

ii) Pessimistic time.

iii) Most likely time

regarding an activity.

b) In a PERT network, the critical path comprises of 5 activities whose estimated durations in weeks are given below: **[10]**

| Activity	Optimistic Time (t_o)	Most likely Time (t_m)	Pessimistic Time (t_p)
1–2	4	8	12
2–3	5	6	10
3–5	10	12	20
5–8	2	5	8
8–10	3	4	5

i) Draw a project network.

ii) Find the expected duration and variance of each activity.

iii) Determine the critical path.

OR

a) For the given network, determine the shortest route from vertex 'a' to vertex 'f' using Dijkstra's algorithm. **[8]**
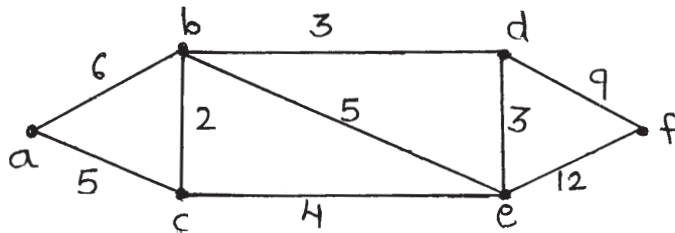
b) Determine the maximal flow in the given network. **[8]**

3
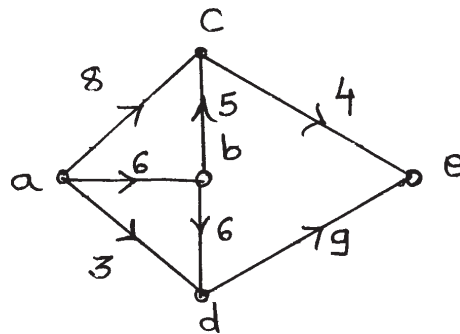
SECTION - II

Q4) a) What is integer linear programming? Explain Branch and Bound Algorithm. **[8]**

b) Solve the following integer programming problem using branch and bound technique.

Maximize

$$Z = 10x_1 + 20x_2$$

Subject to

$$6x_1 + 8x_2 \quad 48$$
$$x_1 + 3x_2 \quad 12$$
$$x_1, x_2 \quad 0 \text{ and integers.}$$ **[10]**

OR

a) Explain with example. **[8]**

i) Exponential smoothing.

ii) Regression.

b) A firm produces two products A and B. Each product must be processed through two departments. Department 1 has 30 hours of production capacity per day and department 2 has 60 hours. Each unit of product A requires 2 hours in department 1 and 6 hours in department 2. Each unit of product B requires 3 hours in department 1 and 4 hours in department 2. Management has rank ordered the following goals it would like to achieve in determining the daily product mix:

P_1: Minimize underachievement of joint total production of 10 units.

P_2: Minimize underachievement of producing 8 units of product A.

P_3: Minimize underachievement of producing 7 units product B.

Formulate this problem as GP and then solve it. **[10]**

Q5) a) What are the types of Decision making environment? Explain any one in detail. **[8]**

b) A decision problem is represented by the following pay-off matrix.

Strategies	States of Nature		
	N_1	N_2	N_3
S_1	10	15	5
S_2	20	10	7
S_3	25	35	40

4

Which strategy should be chosen on the basis of

i) Maximin   ii) Minimax

iii) Maximax   iv) Laplace.   **[8]**

<div align="center">OR</div>

a) What is decision making under risk? Explain expected value criterion.
                   [8]

b) Explain and illustrate the following principles of decision making. **[8]**

  i) Laplace   ii) Hurwicz

  iii) Regret   iv) Maximin

Q6) a) List   **[8]**

  i) Merits   ii) Demerits

  iii) Applications   iv) Types of Simulation.

b) EXCEL bakery maintains sufficient stock of its 'Ever delight' cake and the daily demand is as follows:

Daily Demand	0	10	20	30	40	50	60	70	80
Probability	0.02	0.16	0.23	0.15	0.13	0.12	0.10	0.06	0.03

Using the following sequence of random numbers simulate the demand for the next 12 days. **[8]**

<div align="center">OR</div>

a) Write a note on Monte Carlo simulation. **[8]**

b) Generate 7 random numbers based on multiplicative congruential method using **[8]**

b = 17, c = 111, m = 103, seed = 7.

<div align="center">▢▢▢▢</div>

P1291   **[3766]-54**

Third Year M.C.A. (Engineering)
SOFTWARE TESTING
(Elective - I) (Sem. - I) (2005 Course) (315004)

Time : 3 Hours]   [*Max. Marks : 100*

Instructions to the candidates:
1)   *Answers to the two sections should be written in separate answer books.*
2)   *Neat diagrams must be drawn wherever necessary.*
3)   *Assume suitable data, if necessary.*

SECTION - I

Q1) a)   Explain any eight activities related to software metrics which involve some degree of software measurement.   **[8]**

    b)   Define following terms: **[3]**

      i)   Emperical relations.

      ii)   Predictions.

    c)   Explain the process of selecting an experimental design.   **[6]**

OR

Q2) a)   Define the term 'data'. How to collect, store and extract the data, explain with suitable example.   **[8]**

    b)   With example discuss   **[9]**

      i)   Ratio and interval scales of measurement.

      ii)   Correlation of data statistical approach.

Q3) a)   Explain Halstead's major Equations for following: **[12]**

      i)   Total Vocabulary   ii)   Length

      iii)   Volume   iv)   Level

      v)   Difficulty   vi)   Efforts

      Calculate estimated program length and efforts required by taking suitable example?

    b)   Explain following terms: **[5]**

      i)   Modularity   ii)   Morphology

      iii)   Information flow.

P.T.O.

1

Q4) a) Explain different types of structural measures. **[8]**

b) What is cyclomatic complexity? How to compute it? **[6]**

c) What is software size and what is functionality? **[3]**

Q5) a) Explain with suitable example developer / tester support for defect repository. **[6]**

b) Enumerate all components of a Test Plan. Explain test scheduling and test environment planning in details. **[10]**

OR

Q6) What is defect? Give defect classification and definition. List and explain different metrics used for defect prevention. What is additional value of plotting weighted defects? **[16]**

SECTION - II

Q7) a) Explain equivalence partitioning and boundry value analysis with suitable example. **[10]**

b) Explain positive and negative testing concepts. **[7]**

OR

Q8) a) State and explain test adequacy criterias for white box testing methodology. **[10]**

b) Write a short note on domain testing. Give some sample test cases for same. **[7]**

Q9) a) Write a short note on: **[10]**
   i) Test execution and reporting.
   ii) GUI Testing.

b) Explain Ad-voc testing with suitable example. **[7]**

OR

*Q10)*a) What is specification based testing? Explain in detail. **[6]**

b) Write a short note on: **[11]**
   i) Scenario Testing.
   ii) Regression Testing.

2

*Q11)*a) What is a role of customer in problem reporting? Which are priliminary customer side activities in problem reporting? How defects are reported by internal customers? **[9]**

b) Write a note on "Fixdistribution" in software maintenance. **[7]**

OR

*Q12)*Write a notes on: **[16]**

a) Challenges in software maintenance.

b) Best practices for software maintenance.

c) Problem resolution.

d) Problem Identification.

□□□□

P1292   **[3766]-203**

M.C.A. (Under Engineering)
OPERATIONS RESEARCH
(Sem. - II) (New) (510911)

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

Instructions to the candidates:

    1)   *All questions are compulsory.*

    2)   *Answers to the two sections should be written in separate answer books.*

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

    4)   *Use of electronic pocket calculator is allowed.*

    5)   *Assume suitable data, if necessary.*

SECTION - I

Q1) a)   A Television company operates two assembly lines, line I and line II. Each line is used to assemble the components of three types of televisions : colour, standard and economy. The expected daily production on each line is as follows:

TV Model	Line I		Line II
Colour	3	⋛	1
Standard	1		1
Economy	2		6

        The daily running costs for two lines average Rs. 6,000 for line I and Rs. 4,000 for line II. It is given that the company must produce atleast 24 colours, 16 standard and 48 economy TV sets for which an order is pending. Formulate the above problem as LPP to minimise the total cost and solve it by graphical method.   **[8]**

  b)   What is LPP? Write its mathematical form? Write two advantages and two limitations of LPP.   **[4]**

<div align="center">OR</div>

  a)   Solve the following LPP by Simplex Method

        Maximize

            $Z = 45x_1 + 55x_2$

        Subject to

            $6x_1 + 4x_2 \leq 120$

            $3x_1 + 10x_2 \quad 180$

             $x_1, x_2 \quad 0$ **[10]**

b) Write down dual of the following LPP
    Minimise
    $$Z = 4x_1 + 5x_2 + 2x_3$$
    Subject to
    $$2x_1 + x_2 + 4x_3 \quad 150$$
    $$3x_1 + 4x_2 + x_3 \quad 100$$
    $$x_1, x_2, x_3 \quad 0.$$
    [2]

Q2) a) Write a short note on Trans Shipment model. **[4]**

b) For the following transportation problem find IBFS by North-West corner method and find its optimum solution. **[7]**

	Destinations			
Sources	D_1	D_2	D_3	Availability
S_1	3	5	7	30
S_2	4	2	6	25
S_3	7	8	5	35
Demand	40	30 $\geq$ 20		

OR

a) Explain the steps used in the 'Hungarian Assignment Method'. **[5]**

b) A company has a team of four salesman and there are four districts where the company wants to start its business. The following is the profit per day in rupees for each salesman in each district. **[6]**

Districts

		D_1	D_2	D_3	D_4
	A	16	10	14	11
Salesman	B	14	11	15	15
	C	15	15	13	12
	D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit.

2

Q3) a) Draw a network diagram from the following information and calculate

    i)   EST (Earliest Start Time), EFT (Earliest Finish Time), LST (Latest Start Time), LFT (Latest Finish Time).

    ii)   Total float, Independent float, Free float.   **[7]**

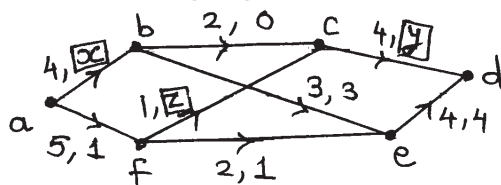| Name	A	B	C	D	E	F	G	H	I	J
Activity	1–2	1–3	1–4	4–5	2–6	3–6	3–5	3–7	5–7	6–7
Duration (in Hrs)	5	8	9	4	7	6	9	12	3	10

  b) Write a short note on PERT.   **[5]**

<div align="center">OR</div>

  a) Apply Floyd's algorithm for the following distance network and generate the final distance matrix and precedence matrix.

    Find the shortest distance between node 1 and node 6.   **[9]**
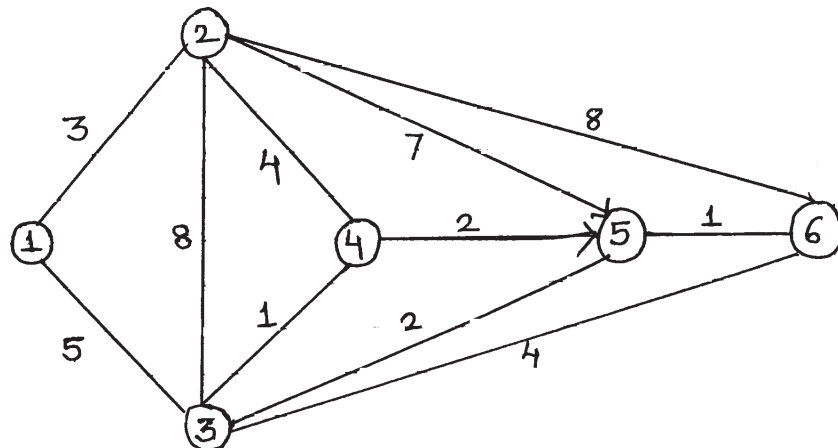
  b) Find the missing figures in the network and the value of flow.   **[3]**

<div align="center">

SECTION - II

</div>

Q4) a) Write Branch and Bound Algorithm.   **[5]**

  b) XYZ is a growth oriented firm which establishes monthly performance goals for its sales force. XYZ determines that the sales force has a maximum available hours per month for visits of 640 hours. Further, it is estimated that each visit to a potential new client requires 3 hours and each visit to a current client requires 2 hours. XYZ establishes two goals for the coming month: **[7]**

i) Contact at least 200 current clients.

ii) Contact at least 120 new clients overachieving either goal will not be penalized.

Solve the GP.

<div align="center">OR</div>

a) Estimate the trend values using the data given by taking a 4-yearly moving average. **[6]**

Year	Value	Year	Value
1994	12	2001	100
1995	25	2002	82
1996	39	2003	65
1997	54	2004	49
1998	70	2005	34
1999	87	2006	20
2000	105	2007	7

b) List the various forecasting models. Explain any one Forecasting models. **[6]**

Q5) a) What is decision making under risk? Explain the criterion used for evaluating various courses of action under risk. **[5]**

b) A retailer purchases cherries every morning at Rs.50 a case and sells them for Rs. 80 a case. Any case that remains unsold at the end of the day can be disposed of the next day at salvage value of Rs. 20 per case (thereafter they have no value). Past sales have ranged from 15 to 18 cases per day.

The following is the record of sales for the past 120 days.

Cases sold :	15	16	17	18
Number of days :	12	24	48	36

Find out how many cases should the retailer purchase per day in order to maximize his profit. **[7]**

<div align="center">OR</div>

a) Give the significance of Decision Analysis. What are the steps of decision making process. **[4]**

b)   The following payoff table for a particular venture has been prepared. **[8]**

Decision Alternatives	State of Nature				
	N_1	N_2	N_3	N_4	N_5
D_1	150	225	180	210	250
D_2	180	140	200	160	225
D_3	220	185	195	190	180
D_4	190	210	230	200	160

Determine the optimal decision using:

i)   Maxmin criterion.

ii)   Regret criterion.

iii) Laplace criterion.

iv)   Hurwicz criterion (take $\alpha = 0.7$)

Q6) a)   Write a short note on Monte Carlo simulation.   **[5]**

b)   In the first year M.C.A. class of a certain college, the first lecture starts at 9 a.m. Following is the probability distribution regarding number of students who are late comers for the first lecture each day.

No. of students coming late	05	10	15	20	25
Probability	0.35	0.30	0.20	0.10	0.05

Using the following sequence of random numbers, simulate the pattern for next 12 days. Also find the average number of students coming late per day.   **[6]**

Random	95	23	12	65	95	61	86	02	92	45	44	48

OR

a)   Define simulation. Write merits and demerits of simulation.   **[4]**

b)   Explain in brief generation of Random Numbers. Generate three random numbers based on multiplicative congruential method using b = 17, c = 111, m = 103, seed = 7.   **[7]**

▢▢▢▢

P1293   **[3766]-404**

S.Y. M.C.A. (Engineering)
JAVA PROGRAMMING
(215013) (Sem. - IV) (2008 Course)

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

Instructions to the candidates:

    1)   *Answer any three questions from each section.*

    2)   *Answers to the two sections should be written in separate answer books.*

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

    4)   *Neat diagrams must be drawn whenever necessary.*

SECTION - I

Q1) a)   What is the difference between interface and a class?   **[6]**

     b)   Describe general structure of class with example.   **[6]**

                           OR

Q2) a)   What are the uses of super and this with respect to inheritance?   **[6]**

     b)   Explain life cycle of thread along with diagram.   **[6]**

Q3) a)   Explain how AWT helps GUI development.   **[6]**

     b)   Explain any one method of AWT control.   **[6]**

                           OR

Q4) a)   Give uses of following swing control.   **[6]**
        i) Jtabbed Pane ii) Jtable iii) Jtree

     b)   Explain Layout manager with example.   **[6]**

Q5) a)   Write a program to a display button with an image on it using swing. The button on the image will change when the button is clicked.   **[5]**

     b)   Write the steps involved in developing and running a local applet. **[6]**

                           OR

Q6) a)   Write a simple applet to draw rectangle which is filled with red color.   **[5]**

     b)   What is the difference an application and applet and give the ways to view an applet?   **[6]**

1

SECTION - II

Q7) a) Explain the concept of creation of ZIP file stream in JAVA. **[6]**

b) What is exception handling? What are different types of exception which can be handled during Input? **[6]**

OR

Q8) a) Give the syntax and use of following method. **[6]**

i) GetName() ii) GetParent() iii) GetPath()

b) Write a program to perform following operation on student database using stream. **[6]**

i) Creation ii) Updation iii) Deletion.

Q9) a) What are four driver available in JDBC? At what situation are four of the drivers used? **[6]**

b) How will you perform truncation using JDBC? **[6]**

OR

*Q10)*a) Compare JDBC and ODBC. How do you connect to the database?**[6]**

b) What is the use of statement class and how to retrieve data from result set? **[6]**

*Q11)*a) What is client server model? What is the use of server socket class?**[5]**

b) Explain the concept of proxy server. **[6]**

OR

*Q12)*a) What are the difference between TCP/IP and OSI reference model?**[5]**

b) Give syntax of following methods of datagram packet class. **[6]**

i) Getport() ii) Getdata()

□□□□

P1294   **[3766]-104**

First Year M.C.A. (Under Engineering Faculty)
PROBABILITY AND STATISTICS
(510904) (2008 Course)

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

Instructions to the candidates:

    1)   *Answers to the two sections should be written on separate answer books.*
    2)   *Figures to the right indicate full marks.*
    3)   *Use of probability table, electronic pocket calculator is allowed.*
    4)   *Assume suitable data, if necessary.*
    5)   *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) a)   Two marbles are drawn in succession from a box containing 10 red, 30 white, 20 blue and 15 orange marbles, with replacement being made after each drawing. Find the probability that i) both are white, ii) first is red and second is white iii) neither is orange. **[6]**

    b)   There are 6 positive and 8 negative numbers. 4 numbers selected at random without replacement and multiplied. What is the probability that the product is positive number? **[6]**

<div align="center">OR</div>

    a)   A man alternately tosses a coin and throws a die beginning with coin. What is the probability that he will get head before he gets a 5 or 6 on a die? **[6]**

    b)   A question is divided into 3 sections A, B and C. Section A contains 2 questions, section B contains 3 questions and section C contains 4 questions. A student is to answer 5 questions, of which at least one should be from each section. Find the probability that the student attempts 5 questions such that he solves only one question from section A. **[6]**

Q2) a)   A textile mill produces cloth in three different shades blue, black and brown. Production of these shades is 30%, 50% and 20% respectively of the total production. It is found from experience that 2%, 3% and 4% of blue, black and brown shades respectively are defective. On general inspection of entire production a specimen is selected at random and found to be defective. Find the probability that it is of black shade. **[6]**

<div align="right">***P.T.O.***</div>

b) Verify whether the function $P(x)$ defined by **[6]**

$$P(x)=\begin{cases} \frac{3}{4}\left(\frac{1}{4}\right)^{x}, & x=0,1,2,3,... \\ 0, & \text{Otherwise} \end{cases}$$

is p.m.f. of a discrete random variable X.

OR

a) A continuous random variable has probability density function; **[6]**

$$f(x)=\begin{cases} kxe^{-\frac{x}{2}}, & x\ge 0 \\ 0, & \text{Otherwise} \end{cases} \text{ find } k \text{ and } P(x \le 5).$$

b) A random variable X has p.m.f. $P(x) = pq^{x-1}$, $x = 1, 2, 3$ ..... find the mean and variance of X. **[6]**

Q3) a) Assume that the average life span of computers produced by a company is 2040 hours with standard deviation of 60 hours. Find the expected number of computers out of 2000 manufactured by a company whose life span is i) more than 2150 hours ii) less than 1950 hours iii) between 1920 and 2160 hours. $\le$ **[6]**

Z	1.833	1.33	2.00
Area from z = 0	0.4664	0.4082	0.4772

b) Let (X, Y) be a discrete bivariate random variable with following p.m.f. **[5]**

Y \ X	-2	0	2
-1	0.1	0.2	0.1
0	0.2	0.1	0.1
1	0.1	0.1	0

Find

i) P(X + Y 2),

ii) Conditional probability distribution of X given Y = 0.

OR

2

a) In a certain factory turning out razor blades, there is a small chance of 0.002 for any blade to be defective. The blades are supplied in packets of 100. Using a Poisson distribution calculate the approximate number of packets containing no defective, one defective and two defective blades respectively in a consignment of 10000 packets.
(Given: $e^{-0.2} = 0.8187$). **[6]**

b) Out of 60 applicants to a university 40 are from south. If 20 applicants are selected at random find the probability that i) 10 are from south, ii) not more than 2 are from south. **[5]**

SECTION - II

Q4) a) Find the mean and variance of a sampling distribution of mean for the population 4, 8, 7, 6, 2, 9 by drawing a sample of size 2 with replacement and without replacement. **[6]**

b) A set of 5 similar coins is tossed 320 times and the result is; **[6]**

No. of heads	0	1	2	3	4	5
Frequency	6	27	72	112	71	32

Test the hypothesis that the data follows a binomial distribution using Chi-square goodness of fit.

OR

a) What is hypothesis testing? What is the significance of alpha and beta? **[6]**

b) What is point estimator and point estimate? What properties of estimator make it a good estimator? **[6]**

Q5) a) A random sample of size 5 is drawn from a binomial distribution with parameter $n = 20$ and p is unknown. Estimate the value of p for a data given by 18, 17, 15, 19, 20 using method of moment. **[6]**

b) A random sample of size n is selected from a normal distribution with mean μ and variance σ^2. Prove that the sample mean X is normally distributes with mean μ and variance σ^2/n. **[6]**

OR

a) Explain the following terms: **[6]**
   i) Null hypothesis and research hypothesis.
   ii) Type I and type II errors.
   iii) Critical region for the test.

b) Construct   chart for the following data: **[6]**

Sample No.	1	2	3	4	5	6	7	8
Observations	32	28	39	50	42	50	44	22
	37	32	52	42	45	29	52	35
	42	40	28	31	34	21	35	44

Q6) a) The length of life X of certain Computer is approximately normally distributed with mean 800 hours and standard deviation 40 hours. If a random sample of 30 computers has a life of 788 hours. Test the null hypothesis that $\mu = 800$ hours against the alternate hypothesis μ 800 hours at 5% level of significance.   **[6]**

b) Explain the term 'p-chart' of statistical quality control.   **[5]**

<div align="center">OR</div>

a) Let X be a variable which stands for elements 5, 9, 13 and Y be a variable which stands for elements 4, 7, 11 of the population. Compute μ_X, μ_Y, σ_X, σ_Y, μ_{X-Y} and σ_{X-Y}.   **[6]**

b) Show that a random sample of size 100, drawn with replacement, the standard error of sample proportion cannot exceed 0.05.   **[5]**

<div align="center">❐❐❐❐</div>

P1295   **[3766]-14**
First Year M.C.A. (Engineering)
PROBABILITY AND STATISTICS
(115004) (2005 Course)

Time : 3 Hours]   [*Max. Marks : 100*

Instructions to the candidates:

1) *Neat diagrams must be drawn wherever necessary.*
2) *Answers to the two sections should be written in separate answers books.*
3) *Figures to the right indicate full marks.*
4) *Use of probability table, electronic pocket calculator is allowed.*
5) *Assume suitable data, if necessary.*

SECTION - I

Q1) a)   A bag contains 5 white and 8 red balls, two drawings of 3 balls are made such that i) the balls are replaced before the second trial and ii) the balls are not replaced before the second trial. Find the probability that the first drawing will give 3 white and second 3 red balls in each case.   **[6]**

b)   Explain the terms: **[6]**
   i)   Independent events
   ii)   Mutually exclusive events
   iii) Conditional probability.

c)   State and prove axioms of probability.   **[5]**

OR

a)   A town has 3 doctors A, B and C operating separately. The probability that the doctors A, B and C would be available is 0.9, 0.6 and 0.7 respectively. What is the probability that: **[6]**
   i)   At least one doctor is available.
   ii)   Exactly 2 doctors are available.

b)   If X and Y are independent random variables with $E[X] = 3$, $E[X^2] = 25$, $E[Y] = 10$ and $E[Y^2] = 164$.

   Find i) $E[2X - 3Y + 7]$
        ii) $Var[3X+Y-8]$.   **[6]**

c)   If X and Y are independent random variable, prove that
$Var(X+Y) = Var(X) + Var(Y)$ **[5]**

P.T.O.

1

Q2) a) In a certain factory turning out razor blades, there is a small chance of 0.002 for any blade to be defective. The blades are supplied in packets of 100. Using a Poisson distribution calculate the approximate number of packets containing no defective, one defective and two defective blades respectively in a consignment of 10000 packets. (given $e^{-0.2} = 0.8187$) **[6]**

b) A die is thrown until 6 appear. What is that probability that it must be thrown more than 5 times? **[6]**

c) State and prove multiplication theorem of probability. **[5]**

OR

a) Determine *k* such that the function defined as follows is a p.m.f. **[6]**

$$P(x) = \begin{cases} k \times 2^{-x}, & \text{for } x = 1, 2, 3, ... \\ 0, & \text{otherwise} \end{cases} \quad \text{also find } P(x < 5).$$

b) The students in a class are selected at random, one after the other for an examination. Find the probability that the boys and girls in the class alternate, if i) the class consist of 4 boys and 3 girls ii) 3 boys and 3 girls. **[6]**

c) Explain the term memory-less property of Geometric distribution. **[5]**

Q3) a) The joint probability function of two variables X and Y is given by

$$f(x, y) = \begin{cases} k(6-x-y), & \text{for } 0 < x < 2, 2 < y < 4 \\ 0, & \text{otherwise} \end{cases}.$$

Find *k* and $P(x < 1, y < 3)$ **[6]**

b) The average daily sale of 500 branch offices was Rs. 150 thousand and the standard deviation Rs. 15 thousand. Assuming the distribution to be normal, indicate how many branches have sales between Rs. 120 thousand and Rs. 145 thousand. **[5]**

Z values	0.33	2.0
Area	0.1293	0.4772

c) For a uniform distribution of a random variable X defined on [*a*, *b*], show that $E(X) = \dfrac{a+b}{2}$ and $Var(X) = \dfrac{(b-a)^2}{12}$ **[5]**

OR

a) A manufacturer of cotter pins knows that 5% of his product is defective. If he sells cotter pins in boxes of 100 and guarantees that not more than 10 pins will be defective. What is the probability that a box will fail to meet the guaranteed quality? **[6]**

b) Let (X, Y) be a discrete bivariate random variable with following p.m.f.

X \ Y	-2	0	2
-1	0.1	0.2	0.1
0	0.2	0.1	0.1
1	0.1	0.1	0

[5]

Find i)   P(X + Y ≤ 2)

ii)   Conditional probability distribution of X given Y = 0.

c) A random variable X has m.g.f.   find the standard deviation

of X.   **[5]**

SECTION - II

Q4) a) Define $\bar{X}$ $M_X(t) = \dfrac{3}{3-t}$ **[6]**
   i)   Confidence interval for difference and sum.
   ii)   Confidence interval for variance.
   iii) Maximum likelihood estimate.

b) Prove that $\overline{X}$ is an unbiased estimator for μ.   **[6]**

c) What properties should the quality control chart possess?   **[5]**

OR

a) A set of 5 similar coins is tossed 320 times, and the result is: **[6]**

No. of heads	0	1	2	3	4	5
Frequency	6	27	72	112	71	32

Test the hypothesis that the data follows a binomial distribution using Chi-square goodness of fit.

b) What is point estimator and point estimate? What properties of estimator make it a good estimator?   **[6]**

c) Write a note on control limits for the sample mean   and sample range R.   **[5]**

Q5) a) A die has thrown 9000 times and a throw of 5 or 6 was obtained 3240 times. On assumption of random throwing do the data indicate a unbiased die. **[6]**

b) The mean lifetime of a sample of 100 fluorescent light bulbs produced by a company is computed to be 1570 with standard deviation of 120 hours. If μ is the mean life time of all the bulbs produced by the company, test the hypothesis $\mu = 1600$ hours against alternate hypothesis μ 1600 hours using a level of significance of 0.01. **[6]**

c) What is hypothesis testing? What is the significance of alpha and beta? **[5]**

OR

a) Explain the following terms: **[6]**
   i)   Null hypothesis and research hypothesis.
   ii) Type I and type II errors.
   iii) Critical region for the test.

b) Construct   chart for the following data: **[6]**

Sample No.	1	2	3	4	5	6	7	8
Observations	32	28	39	50	42	50	44	22
	37	32	52	42	45	29	52	35
	42	40	28	31	34	21	35	44

c) Explain the term one-tailed and two-tailed text. **[5]**

Q6) a) A random sample of size *n* is selected from a normal distribution with mean μ and variance σ^2. Prove that the sample mean X is normally distributes with mean μ and variance σ^2/n . **[6]**

b) Explain the terms **[6]**
   i)   Interval estimate.
   ii) Unbiased estimate.
   iii) Efficient estimate.
   iv) Confidence limit.

c) Write a short note on standard error of statistic. **[4]**

OR

a) Observations on a random variable X are recorded as 306, 295, 300, 350, 290, 310, 315, 301, 308.
   Find ; i) Sample mean ii) Sample median iii) Sample range. **[6]**

4

b)   A personal manager is trying to determine whether absenteeism is greater on one day of the week than on another. His record for past year shows the following sample distribution. Test whether the absence is distributed uniformly over the week.   **[6]**

Days of week	Monday	Tuesday	Wednesday	Thursday	Friday
No. of absence	66	57	54	48	75

c)   Explain the term 'p-chart' of statistical quality control.   **[4]**

□□□□

P1296   **[3766]-31**

Second Year M.C.A. (Engineering)
OPERATING SYSTEMS
(2005 Course) (215001)

Time : 3 Hours]   [*Max. Marks : 100*

Instructions to the candidates:

1) *Attempt any three questions from each section.*
2) *Answers to the two sections should be written in separate answer books.*
3) *Figures to the right indicate full marks.*
4) *Neat diagrams must be drawn wherever necessary.*
5) *Your answers will be valued as a whole.*
6) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) Differentiate between a compiler and an interpreter with proper examples.   **[6]**

   b) Describe the various phases of a language processor.   **[6]**

   c) Define an assembler, how does an assembler work? Explain the working of an assembler with supportive block diagram.   **[6]**

OR

Q2) a) What is a macro? Explain the model of a macroprocessor.   **[6]**

   b) Explain the organization for a single pass assembler in detail.   **[6]**

   c) Explain the concept of a cross-assembler and any 3 features of MASM in brief.   **[6]**

Q3) a) Define a loader. Describe the important functions of a loader.   **[4]**

   b) Describe any 4 schemes of loaders in detail.   **[8]**

   c) Explain the concept of Linking and debugging.   **[4]**

OR

Q4) a) Explain the concept of parsing and name any 2 parsing techniques.**[4]**

   b) Explain all the phases of compilers in detail.   **[8]**

   c) Why is the phase of Lexical analysis important? Why is input buffering important in Lexical Analysis?   **[4]**

Q5) a) State any 4 functions of an operating system in brief. **[4]**

b) Write short notes on :- **[8]**
   i) Batch processing systems with examples.
   ii) Time sharing systems with examples.

c) Define the following terms:- **[4]**
   i) Process
   ii) Program
   iii) Task
   iv) Thread.

OR

Q6) a) Define process scheduling, also name any 2 scheduling algorithms.**[4]**

b) Write short notes on :- **[8]**
   i) Layered structure
   ii) Kernel based structure.

c) What are the different scheduling criteria for scheduling algorithms.**[4]**

SECTION - II

Q7) a) What are the aspects of memory management? **[6]**

b) Compare and contrast contiguous and non-contiguous memory allocation. **[6]**

c) State any 3 differences with explanation between paging and segmentation. **[6]**

OR

Q8) a) What is the concept of Virtual Memory? Explain concepts of logical and physical addresses. **[6]**

b) Explain the following with respect to memory management. **[6]**
   i) Compaction
   ii) Fragmentation
   iii) Swapping.

c) Explain :- **[6]**
   i) Best Fit allocation algorithm
   ii) First Fit allocation algorithm.

Q9) a) Explain any 3 characteristics of I/O devices. **[6]**

b) Explain the following :- **[6]**
   i) A file
   ii) File operations
   iii) A Directory structure

c) Describe the basic I/O organization. **[4]**

OR

*Q10)*a) How does Direct Memory Access [DMA] increase system concurrency? How does it complicate the hardware design? **[6]**

b) Explain any 3 file access methods. **[6]**

c) Explain the concept of file protection. What are the different access rights given to a file? **[4]**

*Q11)*a) Explain the following components of a Linux system. **[6]**
   i) Kernel
   ii) System libraries
   iii) System utilities.

b) What is a system call? What is a system command? **[4]**

c) What are the 2 major functionalities of a Linux Kernel? **[6]**

OR

*Q12)*a) Explain the following with respect to Linux OS. **[6]**
   i) Fork system call.
   ii) Exec system call.
   iii) Process ID.
   iv) Thread.
   v) Exit system call.
   vi) Kmalloc.

b) Draw and explain the basic Linux file system organization. **[4]**

c) Draw and explain the basic Linux Kernel components. **[6]**

❑❑❑❑

3

P1297   **[3766]-41**

Second Year M.C.A. (Engineering)
SOFTWARE ENGINEERING - I
(215009) (2005 Course)

Time : 3 Hours]   *[Max. Marks : 100*

Instructions to the candidates:

1) *Answer any three questions from each section.*

2) *Answers to the two sections should be written in separate answer books.*

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

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

5) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) What are specialised process models? Explain Aspect Oriented Software development.   **[8]**

    b) State the framework activities involved in concurrent development model.   **[8]**

                                    OR

Q2) a) What is the purpose of process assessment? What formal techniques are available for assessing the software process.   **[8]**

    b) Explain the significance of Personal and Team Process models. What framework activities are used during PSP?   **[8]**

Q3) a) State and explain different principles to be followed as the team prepares for delivery of an increment.   **[8]**

    b) What is Product Engineering? Explain the different views in product engineering.   **[9]**

                                    OR

Q4) a) List and explain the system elements of computer based systems. **[8]**

    b) What are planning practices? Explain the different principles applied in planning practices.   **[9]**

Q5) a) What are the basic guidelines for conducting a collaborative requirements gathering meeting?   **[8]**

                                                              P.T.O.

1

b) Ashoka group of hotels is building a new system for hotel management that will have the following features. **[9]**

 – System will provide the GUI user interface with menus, error msgs and various options.

 – System handles various details of customer's rooms special facilities provided to them.

 – System generates routine MIS reports for administration.

 – System generates bills and receipts.

For the above system, write scope and with appropriate assumptions draw use case diagram.

OR

Q6) a) Draw level 0, level 1 and level 2 data flow diagram for the above problem statement. **[8]**

 b) How do we go about developing the class based elements of an analysis model identify class, attributes and operations. **[9]**

SECTION - II

Q7) a) State and explain briefly different architectural styles. **[8]**

 b) What is archetypes? How archetypes are depicted using UML notation? **[8]**

OR

Q8) Explain in brief (any 4): **[16]**

 a) Patterns

 b) Modularity

 c) Function Independence

 d) Design classes

 e) Refactoring

 f) Abstraction.

Q9) a) What are alpha and beta testing? **[8]**

 b) What are different debugging strategies? **[9]**

OR

Q10) a) What is a graph matrix? How do we extend it for use in testing? **[8]**

 b) Explain loop testing? Explain different classes of loops. **[9]**

2

*Q11)*a) Explain Goal Question metric paradigm.   **[8]**

    b) Explain function point metric? Explain with appropriate example. **[9]**

<p style="text-align:center">OR</p>

*Q12)*a) What characteristics can be measured when we assess an object oriented design?   **[8]**

    b) i)   Define Software quality.   **[9]**

        ii)   Explain McCall's Quality factors.

        iii) State attributes of ISO 9126 Quality factors.

<p style="text-align:center">□□□□</p>

3

P1403   **[3766]-24**

F. Y. M.C.A. (Engineering)
MICROPROCESSOR APPLICATIONS
(2005 Course)

Time : 3 Hours]   [*Max. Marks : 100*

Instructions to the candidates:
  1)   Answers to the two sections should be written in separate answer books.
  2)   Neat diagrams must be drawn wherever necessary.
  3)   Assume suitable data, if necessary.

SECTION - I

Q1) a)   What is full decoding and partial decoding? How it affects the interfacing?   **[8]**

  b)   Explain all the registers of 8085 in detail.   **[8]**

                    OR

Q2) a)   Draw and explain the functional block diagram of 8085.   **[10]**

  b)   Explain how does 8085 manage to use the Address/ Data bus separately.   **[6]**

Q3) a)   What is the role of stack area of the memory? Explain how is it implicitly and explicitly accessed?   **[8]**

  b)   Draw the timing diagram of LXI H, 2100.   **[8]**

                    OR

Q4) a)   How does fast 8085 synchronize with slow peripherals? Explain in detail with signals involved.   **[8]**

  b)   What are the various addressing modes of 8085?   **[8]**

Q5) a)   What are the advantages of using I/O mapped I/O over memory mapped I/O? What are the disadvantages?   **[8]**

  b)   Give the complete Interfacing details to interface 4 × 4 key matrix and 2–Digit seven segment display using 8255.   **[10]**

                    OR

Q6) a)   Explain mode 1, mode 2 and BSR mode operations of 8255 PPI.**[10]**

  b)   Draw and explain block diagram of 8255 PPI.   **[8]**

                    P.T.O.

SECTION - II

Q7) a) Give details of interrupt structure of 8085. What is ISR? **[8]**

b) Draw and explain the block diagram of 8253. **[8]**

OR

Q8) a) Give the details of 8259 PIC. **[8]**

b) Explain mode 2 and mode 3 operations of 8253. **[8]**

Q9) a) Draw and explain the DMA operation with respect to 8085. **[8]**

b) What is the functionality of SOD and SID in 8085? Explain RS 232C interface. **[8]**

OR

Q10) a) Explain 8251 USART in detail. **[8]**

b) Compare and explain synchronous and Asynchronous serial I/O. **[8]**

Q11) a) Draw the programmers model of 8086. Explain in detail. **[8]**

b) Explain maximum mode operation of 8086 in detail. **[10]**

OR

Q12) a) Write an 8086 assembly language program to convert two digit Hexadecimal number into equivalent Binary coded decimal. **[8]**

b) Explain various components of DOS. **[6]**

c) List and explain any four DOS calls. **[4]**

☐☐☐☐

P1404   **[3766]-35**

Second Year M.C.A. (Engineering)
PRINCIPLES OF MULTIMEDIA
(215005) (2005 Course)

Time : 3 Hours]   [*Max. Marks : 100*

Instructions to the candidates:

    1)   *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 from Section I and Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12 from Section II.*

    2)   *Answers to the two sections should be written in separate answer books.*

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

    4)   *Use of electronic pocket calculator is allowed.*

    5)   *Assume suitable data, if necessary.*

SECTION - I

Q1) a)   What is multimedia? Explain building blocks of multimedia along with uses of multimedia. **[10]**

    b)   Explain the features of User interfaces. Discuss any one user interface.**[8]**

<div align="center">OR</div>

Q2) a)   What is streaming? How it is useful in multimedia application development? List the protocols use in streaming. **[10]**

    b)   Explain how windows support the multimedia application in terms of Software and Hardware. **[8]**

Q3) a)   Explain BMP file format in detail. **[8]**

    b)   Explain what do you mean by Image Enhancement? Explain the concept of spatial filtering. **[8]**

<div align="center">OR</div>

Q4) a)   What is JPEG Compression? Explain various modes of JPEG compression and corresponding variations in the steps of JPEG. **[8]**

    b)   Explain the process of image acquisition and the devices involved in it. **[8]**

Q5) a)   What are the objectives of MPEG-4 standard? With the help of abstract model, explain the audio encoding using MPEG standard. **[8]**

    b)   Explain the fundamental characteristics of the Audio. What factors decide quality of sound? **[8]**

<div align="right">*P.T.O.*</div>

Q6) a) What is MIDI? Compare MIDI sound with digital sound. **[8]**

b) Explain wave file format of audio storage. Also give different audio file formats. **[8]**

SECTION - II

Q7) a) What do you mean by lossy and lossless compression? Compress the string <<ABABBABCABABBA>> using LZW text compression technique. **[10]**

b) What are the limitations of CD-ROM technology? What are its advantages over DVD? **[8]**

OR

Q8) a) Calculate the capacity of a CD-DA, which has a 74 min play time. The sound stored on CD-DA is a stereo, 16-bit linear quantified at 44.1 KHz sampling rate. **[10]**

b) Compare NTSC, PAL and SECAM broadcasting standards. **[8]**

Q9) a) Explain the features of VRML 2.0 using examples. **[8]**

b) Explain Charge Coupled Devices used in VR applications. **[8]**

OR

Q10) a) Explain design of Virtual Reality chair used in VR-Applications. **[8]**

b) What do you mean by 3D sound? How does a human being determine the position of a sound source? **[8]**

Q11) a) Differentiate between 2D and 3D animation. Also explain types of Animations. **[8]**

b) Write short notes on:- **[8]**
   i) Kinematics
   ii) Morphing.

OR

Q12) a) Explain principles of animation with example. **[8]**

b) Explain the full process of animation using example. **[8]**

□□□□

P1405　　　　　　　　**[3766]-204**

First Year M.C.A. (Engineering)
MICROPROCESSOR APPLICATIONS
(510912) (2008 Course)

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

Instructions to the candidates:

　　1)　Answers to the two sections should be written in separate answer books.

　　2)　Neat diagrams must be drawn wherever necessary.

　　3)　Assume suitable data, if necessary.

SECTION - I

Q1) a)　Explain the functional block diagram of 8085 microprocessor.　**[8]**

　　　b)　What is a latch IC? Explain its role interfacing.　**[4]**

　　　　　　　　　　　　　　OR

Q2) a)　What is the role of various flags in 8085. Explain with example.　**[6]**

　　　b)　Explain partial and full decoding with example.　**[6]**

Q3) a)　Draw and explain the timing diagram for an instruction MVI A,05.　**[6]**

　　　b)　Explain the execution of following instructions.　**[6]**
　　　　　i) SHLD ii) POP iii) PCHL.

　　　　　　　　　　　　　　OR

Q4) a)　What is stack memory? How is it accessed?　**[6]**

　　　b)　Write an 8085 Subroutine to swap the nibbles of 8 bit number.　**[6]**

Q5) a)　Explain mode 1 operation of 8255 PPI.　**[4]**

　　　b)　Draw and explain the block diagram of 8255 PPI.　**[7]**

　　　　　　　　　　　　　　OR

Q6) a)　List and explain all I/O related instructions of 8085.　**[4]**

　　　b)　What are the advantages and disadvantages of I/O mapped I/O over Memory mapped I/O.　**[4]**

　　　c)　Compare interrupt driven I/O and polled I/O.　**[3]**

P.T.O.

Q7) a) Explain various interrupts of 8085. **[5]**

 b) Explain mode 0 and mode 1 operation of 8253 with neat diagrams.**[6]**

OR

Q8) a) Draw the block diagram of 8253. Explain in brief. **[7]**

 b) What is ISR? How is it executed in 8085? **[4]**

Q9) a) Draw and explain the programmer's model of 8086. **[8]**

 b) Explain Maximum mode operation of 8086. **[4]**

OR

*Q10)*a) Explain Minimum mode operation of 8086. **[6]**

 b) What is segmentation? Explain in detail. **[6]**

*Q11)*a) Write an 8086 assembly language program to reverse 5 numbers in an array. **[6]**

 b) Explain various registers of 8086. **[6]**

OR

*Q12)*a) Write an 8086 assembly language program to convert two digit Hexadecimal number into equivalent Binary Coded Decimal number.**[6]**

 b) List and explain the any 3 DOS and BIOS Calls each. **[6]**

□□□□

P1406   **[3766]-205**

First Year M.C.A. (Engineering)
MANAGEMENT INFORMATION SYSTEMS
(2008 Course)

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

Instructions to the candidates:
   1)   *Answers to the two sections should be written in separate answer books.*
   2)   *Figures to the right indicate full marks.*
   3)   *From Section I, answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.*
   4)   *From Section II, answer Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.*
   5)   *Neat diagrams must be drawn wherever necessary.*
   6)   *Make suitable assumptions wherever appropriate and relevant.*

SECTION - I

Q1) a)   Explain the various levels of management.   **[6]**

      b)   Describe in detail the Information Systems (IS) hierarchy.   **[6]**

                                   OR

Q2) a)   Explain the broader classes of strategies.   **[6]**

      b)   What is infrastructure management? What are the different hardware
           acquisition issues?   **[6]**

Q3) a)   Explain in detail Production Management as an application of Management
           Information Systems.   **[6]**

      b)   Explain the importance of Management Information Systems (MIS) in
           the service industry.   **[6]**

                                   OR

Q4) a)   What are the challenges in implementing Information System (IS)?
           What is the importance of change management?   **[6]**

      b)   Explain in detail Transaction Processing Systems as an application of
           Management Information Systems.   **[6]**

Q5) a)   Explain the steps in Enterprise Resource Planning (ERP)
           implementation. What are the benefits of Enterprise Resource Planning
           (ERP) solutions?   **[6]**

      b)   Define Enterprise Management System (EMS). What are its
           components?   **[5]**

                                                                    P.T.O.

1

Q6) a) What is call center? What are the different activities performed in call centers? **[6]**

b) What are the steps in Business Process Re-engineering? Explain. **[5]**

SECTION - II

Q7) a) Write a short note on - Supply Chain Management (SCM). **[6]**

b) Explain B2B, B2C and C2C types of e-Commerce. **[6]**

OR

Q8) a) What is Customer Relationship Management? Explain the challenges and trends in Customer Relationship Management. **[6]**

b) Write a short note on Electronic fund Transfer. **[6]**

Q9) a) What are the benefits and risks of decision support system? **[6]**

b) Explain the various analysis methods in decision support system. **[6]**

OR

*Q10)*a) Differentiate between Management Information Systems and Decision Support Systems. **[4]**

b) List the different domains of Artificial Intelligence. **[4]**

c) Explain the architecture of Data Warehousing. **[4]**

*Q11)*a) List the issues involved in global management of information technology. **[6]**

b) Explain biometric security and elaborate on fault-tolerant systems. **[5]**

OR

*Q12)*a) What is disaster recovery plan? Explain steps involved in developing a disaster recovery plan. **[6]**

b) What is the Need of Information Security? List different hacking techniques. **[5]**

□□□□

P1407　　　　　　　　　　**[3766]-301**

Second Year M.C.A. (Engineering)
OPERATING SYSTEM
(610901) (2008 Course)

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

Instructions to the candidates:

　　1)　Answer any three questions from each section.
　　2)　Answers to the two sections should be written in separate answer books.
　　3)　Neat diagrams must be drawn wherever necessary.
　　4)　Figures to the right indicate full marks.
　　5)　Assume suitable data, if necessary.

SECTION - I

Q1) a)　What is the use of stack in Macro-Processor? Give example.　　**[6]**

　　b)　What features of assembly language makes it mandatory to design a two pass assembler? Explain with suitable example.　　**[6]**

　　　　　　　　　　　　　　　　OR

Q2) a)　Enlist the different types of errors that are handler by PASS-I and PASS-II of two PASS assembler.　　**[6]**

　　b)　Draw a neat flowchart for macroprocessor to handle nested macro definitions.　　**[6]**

Q3) a)　Define the terms:　　**[6]**
　　　　i)　Incremental compiler.
　　　　ii)　Cross compiler.
　　　　iii)　Bootstrap Compiler.

　　b)　Consider the following segment of code.　　**[6]**
```
main()
{
    int a,b;
    float a,b;
    a = 10 + b;
    b = a * s;
}
```
　　　Show the output of lexical analyzer for the above code segment.

　　　　　　　　　　　　　　　　　　　　　　　　　P.T.O.

Q4) a) Enlist the various tables used and created by the lexical analyzer? Give the format of each of these tables. **[8]**

b) State TRUE or FALSE: **[4]**

   i) Loader loads and execute the object code.

   ii) Linker and loader not needed with re-locatable programs.

   iii) Transfer vector is used by direct linking loader.

   iv) In absolute loader relocation is done by assembler.

Q5) a) Consider the following set of processes: **[5]**

Process	Burst Time	Priority
P_1	10	3
P_2	1	1
P_3	2	3
P_4	1	4
P_5	5	2

Assume arrival time for all processes is at time O in order P_1, P_2, P_3, P_4, P_5. Calculate the turn around time and waiting time for each process using FCFS and SJF.

b) With the help of neat diagram explain the state transition of a process.**[6]**

Q6) a) What is long-term, short-term and medium-term scheduling? Which one of there is used in process scheduling? **[5]**

b) Explain the difference between preemptive and non-preemptive process scheduling with an example. **[6]**

SECTION - II

Q7) a) Explain virtual memory management. **[6]**

b) What is swapping? Explain how space is allocated using swapping.**[6]**

Q8) a) Consider the following page reference string 1, 2, 3, 4, 2, 1, 5, 6, 1, 2, 3, 7. Number of page frames are three. Show the page trace and calculate number of page faults for the following page reference schemes **[8]**

   i) LRU

   ii) Optimal.

b) State TRUE or FALSE: **[4]**

    i) In a system which uses mono programming without swapping or paging, only one process is running at a given time.

    ii) The concept of virtual memory allows programs to run even when they are partially in main memory.

    iii) Paging system is used in virtual memory system.

    iv) Multi programming increases the CPU utilization.

Q9) a) What are the different issues related to disk performance? Explain any one disk scheduling algorithm with suitable example. **[8]**

    b) What are the advantages and disadvantages of C-SCAN scheduling algorithm? **[4]**

OR

Q10) a) Consider a disk system with 100 cylinders. The request to access the cylinders occurs in following sequence: 4, 34, 10, 7, 19, 73, 2, 15, 6, 20. Assuming that the head is at cylinder 50, what is the total distance that disk arm moves to satisfy all the pending requests for the following disk scheduling algorithms: **[10]**

    i) SCAN ii) SSTF iii) FCFS.

    b) With respect to file system, what is symbolic linking? **[2]**

Q11) a) Compare and constrast micro kernel and monolithic Kernel? **[5]**

    b) State and explain fork, wait and exec, process management system calls. **[6]**

OR

Q12) a) State salient features of Linax operating system. **[5]**

    b) Why the file system mounting is required? Explain the process of mounting. **[6]**

□□□□

P1408   **[3766]-305**

Second Year M.C.A. (Under Engineering)
PRINCIPLES OF MULTIMEDIA
(611905) (2008 Course)

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

Instructions to the candidates:

1)   *Answer Q.1 or Q.2; Q.3 or Q.4; Q.5 or Q.6 from Section-I and Q.7 or Q.8; Q.9 or Q.10; Q.11 or Q.12 from Section-II.*

2)   *Answers to the two sections should be written in separate answer books.*

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

4)   *Use of electronic pocket calculator is allowed.*

5)   *Assume suitable data, if necessary.*

SECTION - I

Q1) a)   Explain what do you mean by multimedia document architecture? Also explain what are ODA and OMF?   **[8]**

   b)   Explain the features of QT.   **[4]**

                          OR

Q2) a)   State and explain goals and objectives of Multimedia.   **[8]**

   b)   What is authoring tool? Explain any one authoring tool used in multimedia.   **[4]**

Q3) a)   Explain BMP file format in detail.   **[8]**

   b)   Explain what do you mean by Image Enhancement? Explain the concept by point processing.   **[4]**

                          OR

Q4) a)   Discuss the various factors that influence the brightness of a pixel in an image.   **[8]**

   b)   What is Compression? Explain the various types of Compressions used in multimedia.   **[4]**

1

Q5) a) Explain MPEG audio file with its frame Buffer. **[7]**

b) Explain in brief basic component of an audio system. **[4]**

OR

Q6) a) What are MIDI messages? Differentiate between Channel Message and System Message. **[7]**

b) Define following terms with reference to audio- **[4]**

    i)   Sampling theorem   ii)   Quantization

SECTION - II

Q7) a) What do you mean by text compression? Explain how Huffman coding technique is used for text compression. **[8]**

b) Explain the features of H.263. **[4]**

OR

Q8) a) How encoding on a DVD-audio is different from that on a CD-audio. Also explain the architecture of DVD. **[8]**

b) Explain in brief Video Recording System. **[4]**

Q9) a) What is VRML? Explain the applications of VRML with the help of suitable example. **[8]**

b) Why does it takes four nodes to make a simple object in VRML? **[4]**

OR

*Q10)*a) Explain Virtual Reality chair used in VR-Applications. **[8]**

b) What is the use of DEF and USE in VRML? Are there any disadvantages of using DEF and USE for reuse? **[4]**

*Q11)*a) Explain how atmospheric effects can be introduced in 3D Animation.**[7]**

b) Write a short note on- 2D Animation. **[4]**

OR

*Q12)*a) Explain principles of animation with example. **[7]**

b) Explain Key frames and tweening in animation. **[4]**

□□□□

P1507   **[3766]-102**

F. Y. M.C.A. (Engg.)
DISCRETE MATHEMATICS
(510902) (2008 Course)

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

Instructions to the candidates:
  1)   Answer any three questions from each section.
  2)   Answers to the two sections should be written in separate books.
  3)   Neat diagrams must be drawn wherever necessary.
  4)   Assume suitable data, if necessary.

SECTION - I

Q1) a)   Among 50 students in a class, 26 got an A in the first examination and
        21 got an A in the second examination. If 17 students did not get an A
        in either examination, how many students got an A in both
        examinations.   **[4]**

    b)   Prove by induction that the sum of the cubes of three consecutive integers
        divisible by 9. $A \to (\overline{B} \to C)$ and $A(p\overline{B}) \to (A\overline{q} \cup C)$ **[5]**

    c)   If $A \oplus B = A$ C, is B = C, justify.   **[4]**

                            OR

Q2) a)   Prove the following using venn diagram.   **[6]**

        i)

        ii) $(A-B)-C = A-(B \cup C)$

    b)   Consider a set of integers from 1 to 250. Find how many of these
        numbers are divisible by 3, 5 or 7?   **[5]**

    c)   If A = {1}, B = {a, b}, C = {2, 3}, find $A \times B \times C$, A^2, $B^2 \times A$, C^3.**[2]**

Q3) a)   Prove that   are equivalent.
            $p \triangledown q$ and $(p \vee q) \wedge \sim (p \wedge q)$ are equivalent.   **[6]**

    b)   There are two restaurant next to each other. One has a sign that says
        "Good food is not cheap" and the other has a sign that says "Cheap
        food is not Good". Prove that both the statements are logically
        equivalent. Using truth table.   **[7]**

Q4) a) Obtain CNF and DNF of the following formule. **[5]**

  i) $p \wedge (p \to q)$

  ii) $\leftrightharpoons (p \vee q)$

 b) Negate each of the following in such a way that the symbol ~ does not appear before a quantifier. **[8]**

  i)

  ii)

  iii) $\exists x [x.2 = 1]$

  iv) $\forall x \exists y [x + y = 1]$

Q5) a) In how many ways can the letters in the word 'COMMITTEE' be arranged. **[2]**

 b) 6 mens are to be seated round a circular table, how many ways are there of achieving this? How many if A refuses to sit beside B? **[4]**

 c) Two dice are rolled together. Event A denotes that the sum of numbers on the top faces is even and event B denotes that there is a 4 on at least one of the top faces. Find probability of $P(A \cup B)$ and $P(A \cap B)$. **[3]**

OR

Q6) a) Two cards are drawn from a deck of 54 cards (52 + 23). What is the probability that. **[4]**
  i) Both of them are spade.
  ii) Both are kings.
  iii) Atleast one joker is drawn.
  iv) Both are black queens.

 b) A husband and a wife appear in an interview for two vacancies in the some post. The probability of husbands. Selection is $\frac{1}{3}$ and that of wifes selection is $\frac{1}{2}$. What is the probability that: **[5]**

  i) Both of them will be selected.
  ii) Only one of them will be selected.
  iii) None of them will be selected.

2

SECTION - II

Q7) a) Use Warshalls algorithm to find transitive closure of relation R whose directed graph is as given in fig.1. **[6]**
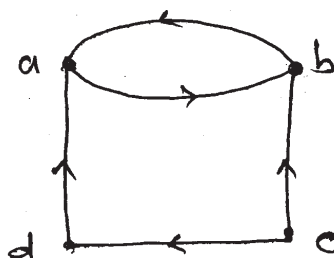

Fig.1

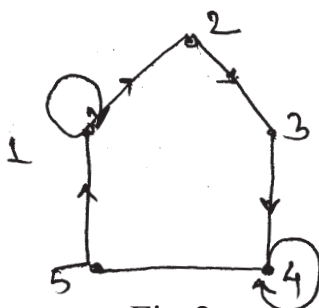b) Find the relation determined by the diagraph in fig.2. **[5]**

Fig.2

OR

Q8) a) Draw the Hasse diagram representing the partial ordering {(a, b) | a divisible b} on {1, 2, 3, 4, 6, 8, 12}. **[5]**

b) Define surjective function, bijective function and injective function with suitable example. **[6]**

Q9) a) Define the following terms: **[6]**
   i)   Multiple graph.
   ii) Weighted graph
   iii) Regular graph.
   iv) Bipartite graph.

b) How many edges has each of the following graphs? **[4]**
   i) K_{12}
   ii) K_3
   iii) $K_{8,9}$
   iv) $K_{5,7}$

c) Is there exist a regular graph of degree 5 on 9 vertices. **[1]**

3

OR

Q10) a) Determine the number of regions defined by a connected graph with 6 nodes and 10 edges. Draw the graph. **[5]**

b) Apply shortest path algorithm to determine a shortest path between *a* and *z* in the graph shown in fig.3. **[6]**
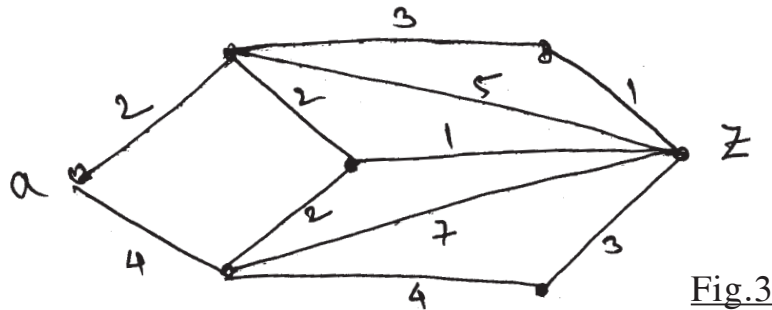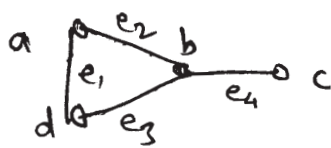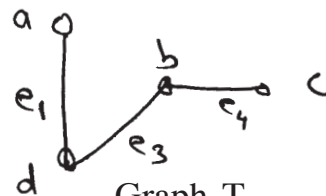

Fig.3

Q11) a) Construct an optimal tree for the weights 8, 9, 10, 11, 13, 15, 22. Find the weight of the optimal tree. **[7]**

b) Find the fundamental cut-sets of the following graph G with respect to the given spanning tree T in fig.4. **[6]**

Graph G   Graph T

Fig.4

OR

Q12) a) Define a spanning tree in a connected graph. Find the minimum spanning tree for the following graph using prisms algorithm, fig.5. **[4]**
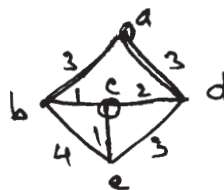

Fig.5

b) Write short notes on: **[9]**

i) Binary search tree and its applications.

ii) Isomorphic and non isomorphic trees.

iii) Max-flow and Min-cut theorem.

▢▢▢▢

P1508   **[3766]-202**

First Year M.C.A. (Faculty of Engg.)
DATA STRUCTURES AND FILES
(510910) (Sem. - II) (2008 Course) (Theory)

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

Instructions to the candidates:
  1)   *Answers to the two sections should be written in separate books.*
  2)   *Neat diagrams must be drawn wherever necessary.*
  3)   *Assume suitable data, if necessary.*

SECTION - I

Q1) a)   Write a note on big on notation used in time and space complexity.**[4]**

   b)   Consider integer array int. a[5][4] declared in C program. If the base address is 510, find the address of the element a[3][2] with the row major and column major representation.   **[6]**

   c)   Explain the concept of ordered list with suitable example.   **[2]**

OR

Q2) Write pseudo C code to multiply two sparse matrices. What is the complexity of your code.   **[12]**

Q3) a)   How do you sort a linked list? Write a C program to sort a linked list.
                                                                  [8]

   b)   What are the advantages of circular linked list.   **[4]**

OR

Q4) a)   Write the steps in Pseudo C code to insert an item in doubly linked list.   **[8]**

   b)   Write a function to check whether two singly link lists are equal or not.
                                                                  [4]

Q5) a)   Convert the following infix expression into postfix expression by showing contents of stack for every iteration.

   (((A/(B Λ C)) + (D&E)) - (A&C)).

   Evaluate the postfix expression obtained by using stack for

   A = 27, B = 3, C = 2, D = 3, E = 17.   **[8]**

   b)   Give any four applications of stack as a data structures.   **[3]**

   *P.T.O.*

1

Q6) a) What is a queue? How is it represented in 'C' using array? What are the operations to be performed to implement a queue using array? Write pseudo codes in 'C' to implement these operations. **[8]**

b) Give an ADT for queue. **[3]**

SECTION - II

Q7) a) Write recursive 'C' function to find out: **[6]**
   i) Height of a given binary tree.
   ii) Width (breadth) of a given binary tree.

b) With respect to the graph in the figure construct the adjacency matrix and adjacency list. **[6]**
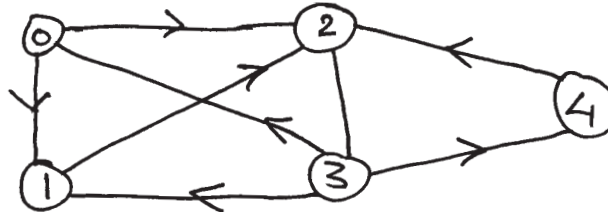
OR

Q8) a) Write a function for following **[8]**
   i) Inorder traversal in a binary tree.
   ii) Pre order traversal in a binary tree.

b) Define the following **[4]**
   i) Spanning tree.
   ii) Graph.

Q9) a) Explain index sequential search with example. **[4]**

b) Write a non recursive algorithm for binary search and analyze its complexity. **[7]**

OR

*Q10)*a) Write pseudo C code for bubble sort and calculate its time complexity. **[6]**

b) Explain in detail Best, Worst and Average time complexity of the following **[5]**
   i) Quick sort.
   ii) Merge sort.

2

*Q11)*a) What are the characteristics of a good hash function? **[4]**

b) Write C pseudo code showing all the primitive operations on simple index file. **[8]**

OR

*Q12)*a) Explain how the records are logically deleted from a file. **[4]**

b) List the various operations in a direct access, file and give C implementation of any two. **[8]**

❑❑❑❑

3

Total No. of Questions : 12]   [Total No. of Pages : 3

P1509   **[3766]-302**

M.C.A. (Engineering Faculty)
DATABASES : CONCEPTS AND SYSTEMS
(610902) (2008 Course)

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

Instructions to the candidates:
  1)   *Answers to the two sections should be written in separate books.*
  2)   *Neat diagrams must be drawn wherever necessary.*
  3)   *Assume suitable data, if necessary.*
  4)   *Section-I : Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.*
  5)   *Section-II : Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.*

SECTION - I

Q1) a) Explain Advantages and disadvantages of Hierarchical Data Model and Network Data Model.   **[7]**

      b) Describe the levels of Data Abstraction in DBMS.   **[4]**

                                    OR

Q2) a) Describe Query Processor and Storage manager components of DBMS.**[7]**

      b) Explain advantages and disadvantages of DBMS approach.   **[4]**

Q3) a) Consider a University database that keeps track of students, their majors, their transcripts and their registrations, as well as of the university's course offerings. The database also keeps track of the sponsored research projects of faculty and graduate students. Draw an E-R Diagram which should be consist of Entity sets, attributes, relationships, mapping cardinality and keys.   **[8]**

      b) Explain strong entity set and weak entity set in detail.   **[4]**

                                    OR

Q4) a) Draw ER Diagram for Banking enterprises which should be consist of Entity sets, attributes, relationships, mapping cardinality and keys, aggregation, specialization, Role and Generalization.   **[8]**

      b) Explain the constrains on Generalization in EER.   **[4]**

Q5) a) What do extension and Intentions of relations mean.   **[4]**

      b) Explain SQL Sequence and View Object.   **[4]**

      c) Explain codd's comprehensive sub-language rule and data independence rule.   **[4]**

                                                              P.T.O.

1

OR

Q6) a) Explain different keys used in relational model and Domain Constraints with suitable example. **[6]**

b) Explain database languages with suitable example. **[6]**

SECTION - II

Q7) a) Consider the following Relations. It defines the schema of the database application for a library. **[10]**

BOOK (Book_ISBN[pk], Title, Publisher_Name[fk])

BOOK_AUTHORS (Book_ISBN [pk,fk], Author_Name[pk])

PUBLISHER (Name [pk], Address, Phone)

BOOK_COPIES (Book_ ISBN [pk,fk], Branch_ID [pk,fk], Num_ Copies)

BOOK_LOANS (Book_ISBN[pk,fk], Branch_ID [pk,fk], Card_Num[pk,fk], Date_Out, Date_Due)

LIBRARY_BRANCH (Branch_ID [pk], Branch_Name, Address)

BORROWER (Card_Num[pk], Name, Address, Phone)

Answer the following queries in each of the SQL query languages that you know:

i) List the ISBN and title of all books written by "John Smith".

ii) List the ISBN and title of all books written by "John Smith" as the only author.

iii) List the Card number and name of all borrowers who checked out two or more books on 10/16/2003.

iv) List the branch ID and name of all library branches that have at least one copy of all the books.

v) List the card number and name of borrowers who check out books from the LPL03 branch.

vi) List the names of authors who use only one publisher.

vii) List the names of authors and a count of the number of books they have published. The list will be in descending order by the number of books.

viii) List the ISBN, title and publisher of all books that have the word "Louisiana" in the title.

ix) List the card number and name of the borrower who has checked out the most books.

x) For each branch list the branch ID and the number of books they have. This is the total number of books including multiple copies.

b) Describe sub query in SQL. **[2]**

Q8) a) The HRD manager has decided to raise the salary for all the employees in department no. 20 by 0.05. Whenever any such raise is given to the employees a record for the same is maintained in the emp_raise table. It includes the employee no, the date when the raise was given and the actual raise. Write a PL/SQL block to update the salary of each employee and insert a record in the emp_raise table, create employee and department table. **[6]**

b) Write short notes on Assertion and Database Triggers. **[6]**

Q9) a) Consider following Relational Table. Find Nontrivial and Trivial Functional Dependency. **[6]**

A	B	C
a_1	b_1	c_1
a_1	b_1	c_2
a_2	b_1	c_1
a_2	b_1	c_3

b) Explain Fact Finding techniques in Database design and analysis. **[5]**

OR

Q10) a) What is Normalization? Explain up to 4th Normal Form with suitable example. **[6]**

b) Compute closure of the following set F of functional dependencies for relational schema R = (A, B, C, D, E)
$F : A \rightarrow BC \quad CD \rightarrow E \quad B \rightarrow D \quad E \rightarrow A$ **[5]**

Q11) a) Explain ACID Properties. **[4]**

b) Describe recovery with concurrent Transactions. **[4]**

c) Explain the method for determining conflicts and view serializability. **[4]**

OR

Q12) Write a short note on: **[12]**

a) Multiversion Timestamp Ordering.

b) Deadlocks Prevention.

□□□□