BCA- III (2010 Course)

4191

AMOOR- III (2010 Course) : OCT / NOV - 2011

Subject : Operating System Concepts

12

Day : Friday
Date : 11/11/2011

4192

Time : 10:00 a.m. to 1:00 p.m.
Max Marks : 70 Total Pages : 1

N.B.:

1) Each question carries **FOURTEEN** marks.
2) Q. No. 1 is **COMPULSORY.**
3) Attempt any **FOUR** questions from Q. No. 2 to Q. No. 7.
4) Draw diagrams **WHEREVER** necessary.
5) Figures to the **RIGHT** indicate full marks.

Q.1 a) Consider the following jobs are to be executed with one processor. **(07)**

Job	Arrival time	Burst time
1	1	5
2	0	7
3	3	3
4	2	10

Calculate average turn around time and total wait time using round robin with time slot = 2.

b) What are different types of operating systems? Explain each in brief. **(07)**

Q.2 a) What is meant by segmentation? Explain segmentation with paging. **(07)**
b) Explain different types of file access methods. **(07)**

Q.3 Consider the following page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. How many page faults would occur for the following page replacement algorithms, assuming 3 frames. **(14)**

a) Least recently used
b) First in First out.

Q.4 a) What is interrupt? Explain how interrupts are handled. **(07)**
b) Explain contiguous storage allocation strategy with example. **(07)**

Q.5 a) Explain layered system structure of operating system. **(07)**
b) What is multiprogramming with variable number of partitions? Explain with suitable examples. **(07)**

Q.6 a) What are services performed by operating system for process management? **(07)**
b) What is deadlock? What are necessary conditions to occur the deadlock? **(07)**

Q.7 Write short notes on any **TWO** of the following: **(14)**

a) Message exchange
b) Interprocess synchronization
c) Virtual memory
d) Principles of security.

AMOOR- III (2010 Course) : OCT / NOV - 2011

Subject : Database Management with Oracle

13

Day : Monday
Date : 14/11/2011

4193

Time : 10:00 a.m. to 1:00 p.m.
Max Marks : 70 Total Pages : 1

N.B:

1) Each question carries **FOURTEEN** marks.
2) Questions I is **COMPULSORY**.
3) Attempt any four questions from Q.2- Q.7
4) Draw neat and clean diagram **WHEREVER** necessary.

Q.1 a) Create a table named Circle with two columns radius and area. Write a PL/SQL block to calculate area of circle for radius varying from 1 to 10 and insert those values into the table. **(07)**

b) What is PL/SQL? Explain the advantages of PL/SQL over SQL. **(07)**

Q.2 a) What is Oracle? Explain the Various tools of Oracle. **(07)**

b) Explain how Oracle satisfies Codd's Rules. **(07)**

Q.3 Explain the following with syntax and example. **(14)**

a) Sequence
b) Stored Procedure and Functions

Q.4 What is Cursor? Explain the various types of cursors with examples. **(14)**

Q.5 a) Write a PL/SQL block to accept 10 numbers in loop and print the Square of accepted even numbers and cube of odd numbers. **(07)**

b) Write a PL/SQL block to check whether a number entered is palindrome or not. **(07)**

Q.6 Consider the following table structure: **(14)**
Dept(D_no,D_name,Location)
Emp(E_no,E_name,salary,commission,Hire_date,D_no,job)

a) Create above tables with proper constraints.
b) Display employees whose name start with letter "a".
c) Display employees hired in the month of October and salary between 5000 and 10000.
d) Display the Department name in which employee named Raj is working.
e) Delete a record from employee whose employee number is 52.
f) Display the employee details in ascending order on column employee name.
g) Display all employees under department "sales" with salary greater than 15000.

Q.7 Write short note on any two. **(14)**

a) SQL Component
b) Triggers
c) Views
d) Locks

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BCA- III (2010)

AMOOR- III (2010 Course) : OCT / NOV - 2011

Subject : Visual Programming

14

Day : Wednesday
Date : 16/11/2011

4194

Time : 10:00 a.m. to 1:00 p.m.
Max Marks : 70 Total Pages : 1

N.B:

1) Each question carries **FOURTEEN** marks.
2) Questions I is **COMPULSORY**.
3) Attempt any four questions from Q.2- Q.7
4) Draw neat and clean diagram **WHEREVER** necessary.

Q.1 **a)** Design Visual Basic application with user interface which will contain a combo box, textbox. Load the distinct city names from "Customer" table in a combo box at a runtime. When user selects a city, it displays appropriate record in the data grid. **(07)**

b) What is Event Driven Programming? Explain how event driven programming differs from procedural programming. **(07)**

Q.2 **a)** Create a Visual Basic application that accepts two numbers and performs mathematical operations such as add, subtract, multiply and divide. Display the result in messagebox. **(07)**

b) Explain different type conversion functions in VB. **(07)**

Q.3 **a)** Describe in detail following control structures with suitable examples. **(07)**
i)If statement
ii)Do until loop

b) What are different data types in VB? **(07)**

Q.4 Differentiate between- **(14)**
i)List box and Combo box
ii)Input box and Message box
iii)Picture box and Image control
iv)Random file and Sequential file Access

Q.5 **a)** Explain how control array are implemented in VB at even time with an example. **(07)**

b) Explain Dialog Box in detail. **(07)**

Q.6 **a)** Explain the properties of data control for connecting to database. **(07)**

b) What is report? Write a procedure to create data report. **(07)**

Q.7 Write short notes (any two) **(14)**

i) Errors in VB
ii) MDI
iii) Data types
iv) Properties of toolbars

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AMOOR- III (2010 Course) : OCT / NOV - 2011

Subject : Management-III (Financial Accounting)

15

Day : Friday
Date : 18/11/2011

4195

Time : 10:00 a.m. to 1:00 p.m.
Max Marks : 70 Total Pages : 2

N.B.:

1) Each question carries **FOURTEEN** marks each.
2) Q. No. 1 is **COMPULSORY.**
3) Solve any **FOUR** questions from Q. No. 2 to Q. No. 7.
4) Figures to the **RIGHT** indicate full marks.
5) Use of non-programmable calculator is allowed.

Q.1 a) Analyze the following transaction of Rohan Traders, Delhi for April 2010 and record the same into the Journal. **(07)**

Date	Transactions
1 April	Started business with Rs.50,000/-.
4 April	Deposited into Bank Rs.10,000/-.
12 April	Salary paid to Ashish Rs.1,800/-.
30 April	Withdraw Rs.500/- for domestic purposes.

b) Define Management accounting and explain its nature and scope. **(07)**

Q.2 What are the advantages and limitations of Budgetary control? **(14)**

Q.3 State the advantages and limitations of marginal costing. **(14)**

Q.4 What is a 'ratio'? What are the limitations of ratio analyzes. **(14)**

Q.5 Define 'Financial Accounting'. What are the functions of Financial Accounting? **(14)**

P.T.O.

Q.6 From the following Trial Balance of Bharat, Mumbai. Prepare Trading a and Loss A/c for the year ended 31st March 2010 and a Balance Sheet a date.

Particular	Debit Rs.	Cre
Capital		
Land & Building	87000	
Plant & Machinery	17500	
Goodwill	20000	
Drawings	22600	
Cash in hand	1795	
Stock on 1st April 2009	27000	
Wages	10000	
Purchase less returns	69000	
Carriage inward	600	
Traveller's commission	6000	
Insurance	2000	
Motor car	3000	
Carriage outward	1400	
Sales less returns		
Salaries	15000	
Bank charges	105	
Reserved for Bad & doubtful debts		
Debtors	20000	
Creditors		
Total Rs.	**3,03,000**	**3**

The following adjustments are to be considered.

a) On 31st March 2010 the stock was valued at Rs.46,000/-.
b) Insurance premium amounting to Rs.800/- is prepaid.
c) Outstanding salaries amounted to Rs.1,000/-.

Q.7 Write short notes on any **TWO** of the following:

a) Sales book
b) Trading A/c
c) Classification of Accounts
d) Tally.

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AMOOR- III (2010 Course) : OCT / NOV - 2011

Subject : Mathematics-III (Graph Theory)

17

Day : Monday
Date : 21/11/2011

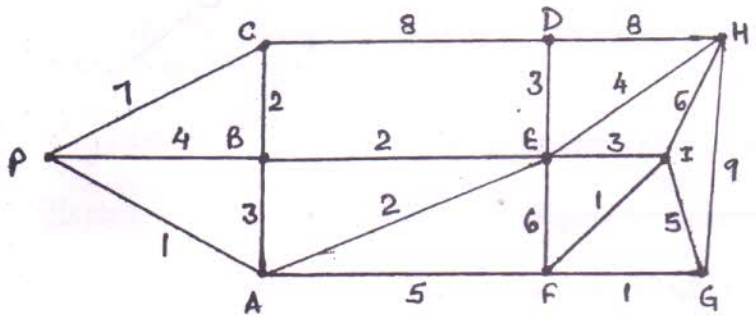
4196

Time : 10:00 a.m. to 1:00 p.m.
Max Marks : 70 Total Pages : 2

N. B. :

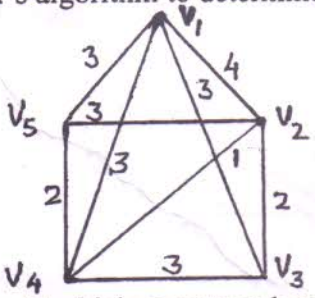
1) Each question carries **FOURTEEN** marks.
2) **Q. No. 1** is **COMPULSORY.**
3) Attempt any **FOUR** questions from **Q. 2** to **Q. 7**
4) Use of **NON PROGRAMMABLE** scientific calculator is allowed.

Q. 1 a) Every morning the lazy postman takes the bus to post office, from there, he chooses the route to reach home as quickly as possible (not ending at the post office) below is map of streets along which he must deliver mail, giving the number of minutes required to walk each block whether delivering or not. P denotes the post office and H denotes the home. What must the edges traveled more than once satisfy? How many times will each edge to be traversed in the optimal route? Use any method. **(08)**



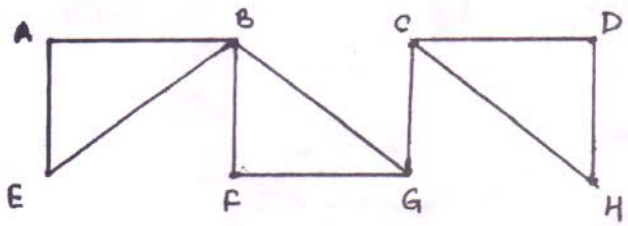
b) Prove that: A finite connected graph G is Eulerian if and only if each vertex has even degree. **(06)**

Q. 2 a) Apply Kruskal's algorithm to determine a shortest path. **(07)**



b) Draw the 2-tree T which corresponds to the algebraic expression $E = (x + 3y)^4 (a - 2b)$ and find preorder of T. **(07)**

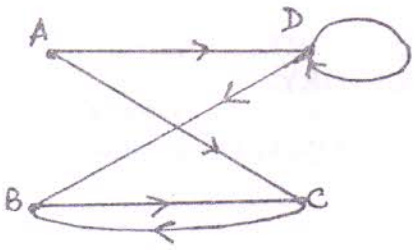
Q. 3 a) Define degree of graph? Find degree of each vertices for below graph: **(07)**



P. T. O.

b) Draw the two, 3-regular graphs with eight vertices.

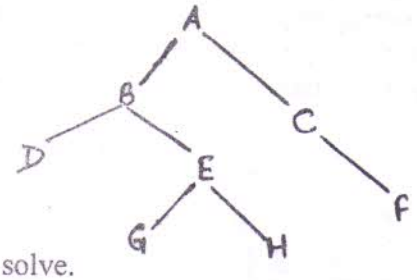
Q. 4 **a)** Find the number of vertices and edges; are there any multiple edges or loops? If so, what are they?



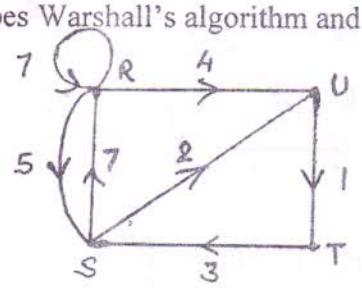
b) For the given tree T , Find:

i) Depth of T

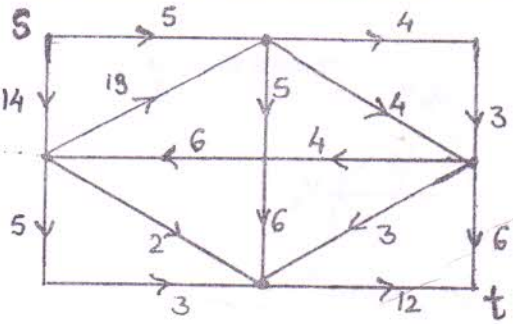
ii) List the nodes of T in preorder, inorder, postorder



Q. 5 Describes Warshall's algorithm and solve.



Q. 6 **a)** In the network below, find a maximum flow from s to t,



b) Draw a diagram for the $G = G(V, E)$ *for all* $V = \{a, b, c, d, e, f\}$, $E = [\{a, d\}, \{a, f\}, \{b, c\}, \{b, f\}, \{c, e\}]$

Q. 7 Write short notes on **ANY TWO** of the following:

a) Coloring of graphs

b) Directed and Undirected graph

c) Maximum Matching

d) Planner Graph

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BCA - III (2004)

AMOOR - III (2004 Course) : OCT / NOV - 2011

Subject : Computer Architecture & Operating System

28

Day : Friday
Date : 11/11/2011

4209

Time : 10:00 a.m. to 1:00 p.m.
Max Marks : 80 Total Pages : 1

N.B.

1) Attempt any **FIVE** questions from Section - I. Each question carries **10** marks.
2) Attempt any **TWO** questions from Section - II. Each question carries **15** marks.
3) Answers to both the section should be written in the **SAME** answer book.

SECTION - I

Q.1 What is operating system? Explain various types of OS.

Q.2 With the help of diagram explain process state transition.

Q.3 Explain in detail IO interface.

Q.4 What is virtual memory? Explain working of virtual memory.

Q.5 Explain instruction format with the help of example.

Q.6 Explain any two page replacement algorithms.

Q.7 Write short notes on: (ANY TWO)

a) Swapping
b) Segmentation
c) Serial Communication

SECTION - II

Q.8 Explain the concept of mutual exclusion and semaphore . How are the two concepts related to each other?

Q.9 What is interrupt? How interrupt is managed by OS?

Q.10 Write short notes on: (ANY THREE)

a) Scheduling Algorithm
b) Page Replacement
c) File System
d) DMA

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AMOOR- III (2010 Course) : APRIL / MAY - 2012

Subject : Operating System Concepts

Day : Wednesday
Date : 18/04/2012

7171

Time : 10:00 a.m. to 1:00 p.m
Max Marks : 70 Total Pag

N.B.:

1) Each question carries **FOURTEEN** marks.
2) Q. No. 1 is **COMPULSORY.**
3) Attempt any **FOUR** questions from Q. No. 2 to Q. No. 7.
4) Draw diagrams **WHEREVER** necessary.
5) Figures to the **RIGHT** indicate full marks.

Q.1 **a)** Consider the following set of processes, with the length of the CPU burst given in milliseconds.

Process	Burst time	Priority
1	10	03
2	01	01
3	02	04
4	01	05
5	05	02

The processes are assumed to have arrived in order 1, 2, 3, 4, 5 all at time 0. Calculate average turn around time and total wait time using shortest remaining time next algorithm.

b) What is multiprogramming with fixed number of partitions? Explain with suitable examples.

Q.2 Differentiate between following.

a) Symmetric and asymmetric multiprocessing
b) External and internal fragmentation.

Q.3 **a)** What is Scheduling? Differentiate between short term, medium term and long term schedulers.

b) Write down the purpose of paging and paging table.

Q.4 **a)** Write down various protection mechanisms of operating system.

b) What is deadlock situation? How it can be avoided?

Q.5 Write down in brief various page replacement algorithms.

Q.6 Define the term operating system. Write down the various types of operating systems with suitable examples.

Q.7 Write short notes on any **TWO** of the following:

a) Segmentation
b) Virtual memory
c) Interrupt
d) Process Control Box.

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AMOOR- III (2010 Course) : APRIL / MAY - 2012

Subject : Database Management with Oracle

65

Day : Saturday
Date : 21/04/2012

7172

Time : 10:00 a.m. to 1:00 p.m.
Max Marks : 70 Total Pages : 1

N.B:

1) Each question carries **FOURTEEN** marks.
2) Questions I is **COMPULSORY**.
3) Attempt any four questions from Q.2- Q.7
4) Draw neat and clean diagram **WHEREVER** necessary.

Q.1 a) Consider the following table structure (07)
Dept(D_no,D_name,Location)
Emp(E_no,E_name,Salary,D_no)
Write a function to accept employee name from the user and check whether he is present in sales department or not. If yes print his details.

b) What is SQL? Explain the various data types of SQL. (07)

Q.2 Explain the following SQL Statements with Example.
a) Create and Alter (07)
b) Insert and update (07)

Q.3 What are Joins? Explain the different types of joins with examples. (14)

Q.4 Explain the types of Exceptions in ORACLE and how they are handled. (14)

Q.5 a) Write a PL/SQL block to accept 10 numbers in a loop and print their sum and average. (07)
b) What is Trigger? Discuss the executions of trigger with Example. (07)

Q.6 Consider the following table structure. (14)
Branch(B_name,B_city)
Borrow(Loan_no,C_name,B_name,Amount)
a) Create above tables with proper constraints.
b) Give the name of borrower having loan number 206.
c) Give the name of Borrower who has taken loan in the range of 5000 to 20000.
d) Give the name of borrower whose names starts with letter "P ".
e) List the total loan taken from M.G.Road branch.
f) Display the borrower table in descending order on column amount.
g) Delete record of a customer "Rajesh" from Borrow table.

Q.7 Write short note on any two. (14)
a) DBA
b) Cursor
c) Views
d) Rollback & Commit

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AMOOR- III (2010 Course) : APRIL / MAY - 2012

Subject : Visual Programming

66

Day : Monday
Date : 23/04/2012

7173

Time : 10:00 a.m. to 1:00 p.m.
Max Marks : 70 Total Pages : 1

N.B:

1) Each question carries **FOURTEEN** marks.
2) Questions I is **COMPULSORY**.
3) Attempt any four questions from Q.2- Q.7
4) Draw neat and clean diagram **WHEREVER** necessary.

Q.1 **a)** Design the user Interface which will contain a listbox and command button. When user clicks on command button it will load student name from "student" table in listbox at runtime. When user select name of the student it displays appropriate record in Data Grid Control. **(07)**

b) What is Event Driven Programming? Explain use of different component used in Visual Basic IDE. **(07)**

Q.2 **a)** Explain the functionality of the following controls (any two) **(07)**
i) Label
ii) Command button
iii) Combo box
iv) Frame Control

b) Explain Menus in detail. **(07)**

Q.3 **a)** Discuss various String functions. **(07)**

b) Write a program to demonstrate the use of Timer Control. **(07)**

Q.4 Explain with sample code how following loop structures are implemented in VB. **(14)**
i) For -------- Next
ii) If then ------- Else ------ Endif
iii) Select Case ---------- End select
iv) Do ------ Until

Q.5 **a)** Differentiate between - **(07)**
i) Check box and Option buttons.
ii) List box and combo box.

b) Explain in detail different types of Dialog Box. **(07)**

Q.6 **a)** Define control array. Explain how control arrays can be implemented at run time in Visual Basic with an example. **(07)**

b) Discuss different types of errors in Visual Basic. **(07)**

Q.7 Write short notes (any two) **(14)**
i) ADO
ii) Data types in VB
iii) TextBox control
iv) Report

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AMOOR- III (2010 Course) : APRIL / MAY - 2012

67

Subject : Management-III (Financial Accounting)

Day : Saturday
Date : 28/04/2012

7174

Time : 10:00 a.m. to 1:00 p.m.
Max Marks : 70 Total Pages : 1

N.B.:

1) Each question carries **FOURTEEN** marks each.
2) Q. No. 1 is **COMPULSORY.**
3) Solve any **FOUR** questions from Q. No. 2 to Q. No. 7.
4) Figures to the **RIGHT** indicate full marks.
5) Use of non-programmable calculator is allowed.

Q.1 a) Enter the following transactions in the journal of Amar Traders, Mumbai for the month of June 2010. **(07)**

Date	Transactions
1 June	Amar started business with cash Rs.8,000/-
3 June	Deposited Rs.4,000/- into state bank of India.
15 June	Sold goods for cash Rs.4500/- @ 2% cash discount
20 June	Received Rs.500/- as interest on investment

b) Define the term 'Financial Accounting'. Explain its functions. **(07)**

Q.2 State the various advantages and limitations of standard costing. **(14)**

Q.3 What is a ratio? What are the significance of ratio analysis? **(14)**

Q.4 State the advantages and limitations of Marginal costing. **(14)**

Q.5 The expenses budgeted for production of 100% capacity in a factory are given below: **(14)**

Items	At 100% capacity Rs.
Materials	6,00,000
Labour	2,00,000
Variable expenses (Direct)	40,000
Variable overheads	2,00,000
Fixed overheads	80,000
Administrative expenses (fixed)	40,000
Selling expenses (10% fixed)	1,20,000
Distribution expenses (20% fixed)	60,000

Prepare a budget for production of
a) 50% capacity.
b) 80% capacity.

Q.6 What are the advantages and limitations of management accounting? **(14)**

Q.7 Write short notes on any **TWO** of the following: **(14)**
a) Ledger
b) Tally
c) Cost sheet
d) Margin of safety.

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68

AMOOR- III (2010 Course) : APRIL / MAY - 2012

Subject : Mathematics-III (Graph Theory)

Day : Monday
Date : 30/04/2012

7175

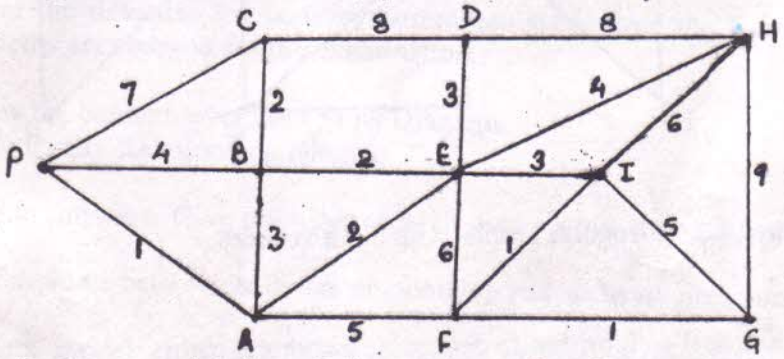
Time : 10:00 a.m. to 1:00 p.m.
Max Marks : 70 Total Pages : 2

N. B. :

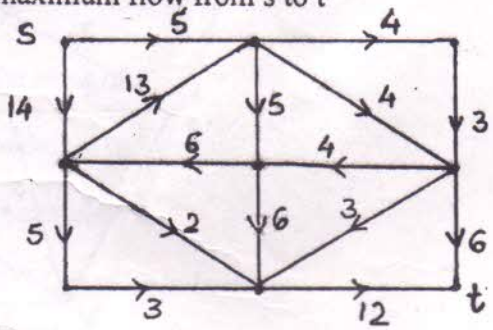
1) Each question carries **FOURTEEN** marks.
2) **Q. No. 1** is **COMPULSORY.**
3) Attempt any **FOUR** questions from **Q. 2** to **Q. 7**
4) Use of **NON PROGRAMMABLE** scientific calculator is allowed.

Q. 1 **a)** Prove or disprove that : Every Eulerian bipartite graph has an even number of edges. **(06)**

b) Every morning the lazy postman takes the bus to post office, from there, he chooses the route to reach home as a quickly as possible (not ending at the post office) below is map of streets along which he must deliver mail, giving the number of minutes required to walk each block whether delivering or not. P denotes the post office and H denotes the home. What must the edges traveled more than once satisfy? How many times will each edge to be traversed in the optimal route? Use any method. **(08)**

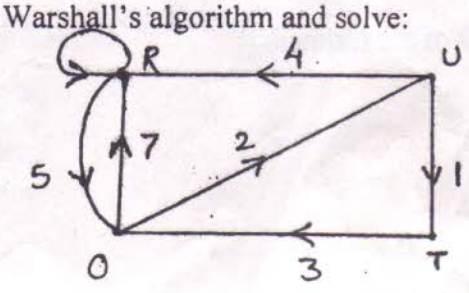


Q. 2 **a)** In the network below, find a maximum flow from s to t **(07)**



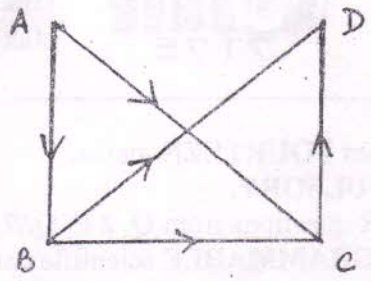
b) Draw a diagram for the **(07)**
$G = G(V, E)$ *for all* $V = \{A, B, C, D\}$,
$E = [\{A, B\}, \{D, A\}, \{C, A\}, \{C, D\}]$

Q. 3 Describe Warshall's algorithm and solve: **(14)**



P. T. O.

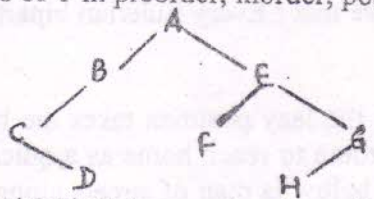
Q.4 a) *Find the number of vertices and edges; are there any multiple edges or loops? If so, what are they?* (07)



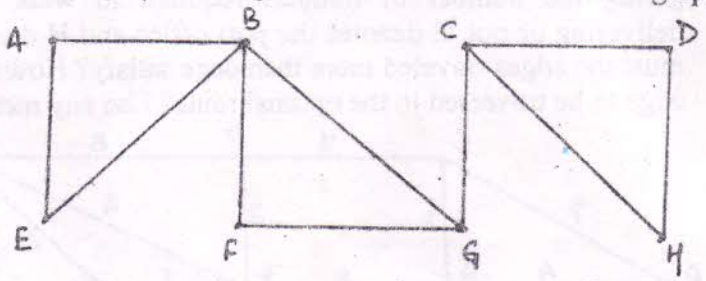
b) For the given tree T, find : (07)

i) Depth of T

ii) List the nodes of T in preorder, inorder, postorder

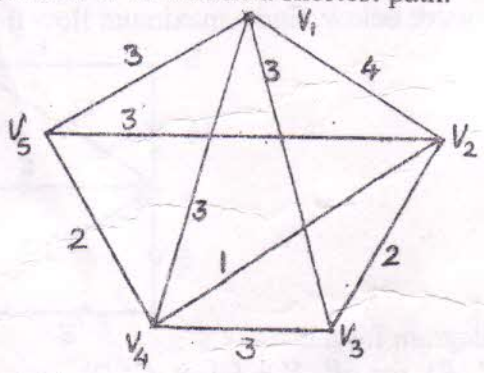


Q. 5 a) Define degree of graph? Find degree of each vertices for below graph: (07)



b) Draw the two, 3-regular graphs with eight vertices. (07)

Q. 6 a) Apply Kruskal's algorithm to determine a shortest path. (07)



b) Draw the 2 – tree T which corresponds to the algebraic expression. (07)
$E = (x + 3y)^4 \ (a - 2b)$ and find preorder of T.

Q. 7 Write short notes on **ANY TWO** of the following: (14)

a) Hamilton graph

b) Eulerian circuits

c) Coloring of graphs

d) Planner Graph

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AMOOR- III (2010 Course) : OCT / NOV - 2012

Subject : Operating System Concepts

10

Day : Saturday
Date : 29/12/2012

10103

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 1

N.B.:

1) Each question carries **FOURTEEN** marks.
2) Q. No. 1 is **COMPULSORY.**
3) Attempt any **FOUR** questions from Q. No. 2 to Q. No. 7.
4) Draw diagrams **WHEREVER** necessary.
5) Figures to the **RIGHT** indicate full marks.

Q.1 **a)** Consider the following jobs are to be executed with one processor. **(07)**

Job	Arrival time	Burst time
1	0	12
2	2	3
3	5	8
4	5	5

Calculate average turn around time and total wait time using shortest remaining time next algorithm.

b) What is operating system? Explain the functions of it. **(07)**

Q.2 **a)** What is meant by paging? Describe the structure of a page table. **(07)**
b) Explain different ways in which free space on disk can be managed in a computer system. **(07)**

Q.3 Consider the following page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. How many page faults would occur for the following page replacement algorithms, assuming 3 frames. **(14)**

a) FIFO (First in First out)
b) Optimal.

Q.4 **a)** What is deadlock situation? How it can be protected? **(07)**
b) Write down various protection mechanisms of operating system. **(07)**

Q.5 **a)** Explain client server model of operating system. **(07)**
b) Describe the different services of operating system performed for process management. **(07)**

Q.6 **a)** What is multiprogramming with fixed number of partitions? Explain with suitable examples. **(07)**
b) What is DMA? Explain in detail. **(07)**

Q.7 Write short notes on any **TWO** of the following: **(14)**

a) Semaphore
b) Preemptive scheduling
c) Process control blocks
d) Swapping.

* * *

AMOOR- III (2010 Course) : OCT / NOV - 2012

Subject : Database Management with Oracle

Day : Monday
Date : 31/12/2012

10104

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 1

N.B:

1) Each question carries **FOURTEEN** marks.
2) Questions I is **COMPULSORY**.
3) Attempt any four questions from Q.2- Q.7
4) Draw neat and clean diagram **WHEREVER** necessary.

Q.1 a) Consider tables Dept(D_no,D_name,location) Emp(E_no,E_name,Salary,D_no) Write a cursor to print the name of employees working in D_no 20 and having salary greater than 50000. **(07)**

b) What is PL/SQL? Explain PL/SQL block with example. **(07)**

Q.2 Explain E.F.codd's rules in detail. Explain how ORACLE satisfies these rules. **(14)**

Q.3 a) Explain the following SQL statements with examples. **(07)**
i) Grant and Revoke
ii) Select Statement

b) Write a PL/SQL block to enter a number and display whether it is odd or even. **(07)**

Q.4 a) Explain any five aggregate functions and any five character functions with examples. **(14)**

Q.5 a) Write a PL/SQL block to enter a number and print factorial of it. **(07)**

b) Write a PL/SQL block to enter a number and print it in reverse order. **(07)**

Q.6 Consider the following tables. **(14)**
Movie(M_no,M_name,M_type,M_star,M_Price)
Invoice(I_no,M_no,Custno,issuedate,returndate)

a) Create above tables with proper constraints.
b) List the names and types of all movies except "comedy" movie.
c) Find the name of customer who have been issued movie of the type "Horror".
d) Find the movie name which has been issued to customer whose name is "Raj"
e) Display the Movie name with minimum price.
f) Change the type of M_no 12 to "Comedy".
g) List the movies whose prices is greater than 2000 and less than 5000.

Q.7 Write short note on any two. **(14)**
a) Exceptions
b) Foreign Key
c) Locks
d) Trigger

AMOOR- III (2010 Course) : OCT / NOV - 2012

Subject : Visual Programming

Day : Wednesday
Date : 02/01/2013

10105

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 1

N.B:

1) Each question carries **FOURTEEN** marks.
2) Questions I is **COMPULSORY.**
3) Attempt any four questions from Q.2- Q.7
4) Draw neat and clean diagram **WHEREVER** necessary.

Q.1 **a)** Design a Visual Basic screen with following components a combo box textbox and command button. Accept name in textbox and when user clicks on command button it has to add in combo box. If duplicate name is added to combo box it has to give information to user and discard that name from combo box. **(07)**

b) What are different String functions used in VB? Explain with suitable examples. **(07)**

Q.2 **a)** Write a program to convert the text of the textbox to Bold, Italic, and Underline by making use of checkboxes **(07)**

b) Explain Event Driven Programming. **(07)**

Q.3 **a)** Explain the concept of MDI. **(07)**

b) Explain the usage of Common Dialog Box in detail. **(07)**

Q.4 **a)** Differentiate between- **(07)**
i) Picture box and Image box
ii) Random and sequential file access

b) Explain any two looping structures in VB with examples. **(07)**

Q.5 **a)** Define control array. Explain how control arrays can be implemented at run- time in VB with an example. **(07)**

b) What are different data types used in VB? **(07)**

Q.6 Create a form for admission process and connect with backend by using databound control having fields for the table student as stud_name, address, gender, date_of_birth, qualification. The records displayed in the textbox should navigate movenext, previous, last, first. Make use of the following components Label, Textbox, option button, ADODB control and command button. **(14)**

Q.7 Write short notes (any two) **(14)**

i) Properties of Toolbars
ii) Data reports
iii) ADO
iv) Error handling with VB
v) Frame Control

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AMOOR- III (2010 Course) : OCT / NOV - 2012

Subject : Management-III (Financial Accounting)

Day : Friday
Date : 04/01/2013

10106

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 2

N.B.:

1) Each question carries **FOURTEEN** marks each.
2) Q. No. 1 is **COMPULSORY.**
3) Solve any **FOUR** questions from Q. No. 2 to Q. No. 7.
4) Figures to the **RIGHT** indicate full marks.
5) Use of non-programmable calculator is allowed.

Q.1 **a)** Journalize the following transactions in the Books of Sunil for May 2011. **(07)**

Date	Transactions
1 May	Started business with cash worth Rs.1,00,000/-.
3 May	Sold goods to Samir Rs.4,200/- on credit.
7 May	Borrowed Rs.25,000 from state bank of India.
17 May	Bought stationery for office use Rs.350.

b) Define the term 'Final accounts'. Explain the importance of preparing final accounts. **(07)**

Q.2 What do you mean by financial accounting? What are the functions of financial accounting? **(14)**

Q.3 Differentiate between financial accounting and management accounting. **(14)**

Q.4 State the various advantages and limitations of standard costing. **(14)**

Q.5 Define the term 'Cost Accounting'. Explain the objectives of Cost Accounting. **(14)**

P.T.O.

14

Q.6 From the following Trial Balance of Chandan Trading Co. Pune. Prepare Trading and Profit and Loss A/c for the year ended 31st March 2011 and a Balance Sheet as on that date. **(14)**

Particular	Debit Rs.	Credit Rs.
Purchases	38,000	
Loose Tools	2,000	
Cash in hand	2,500	
Traveling Exps.	700	
Furniture	2,200	
Bank Balance	7,000	
Petty cash	200	
Stock as on 1st April 2010	1,800	
Investments	10,000	
Sundry Debtors	20,000	
Sales returns	2,300	
Bills receivable	10,000	
Bad debts	5,100	
Drawing's	1,800	
Discount allowed	1,000	
Equipments	14,000	
Power charges	2,100	
Wages	7,200	
Sundry Expenses	1,200	
Insurance	240	
Plant & Machinery	21,000	
Salaries	3,200	
Excise duty	650	
Interest on Bank loan	250	
After sales service exps.	3,000	
Purchase returns		1,000
Miscellaneous income		200
Bank overdraft		14,000
Interest on Investment		1,300
Discount earned		600
Sundry creditors		6,000
Bills payable		1,200
Capital		80,000
Sales		52,000
Commission received		1,140
Total Rs.	**1,57,440**	**1,57,440**

The closing stock as on 31st March 2011 amounted to Rs. 15,300/-.

Q.7 Write short notes on any **TWO** of the following: **(14)**

a) Ledger
b) Purchase book
c) Trial balance
d) Rules of Journalizing the transactions.

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AMOOR – III (2010 COURSE) : OCT / NOV - 2012
SUBJECT : MATHEMATICS – III (GRAPH THEORY) 15

Day : Saturday
Date : 05-01-2013

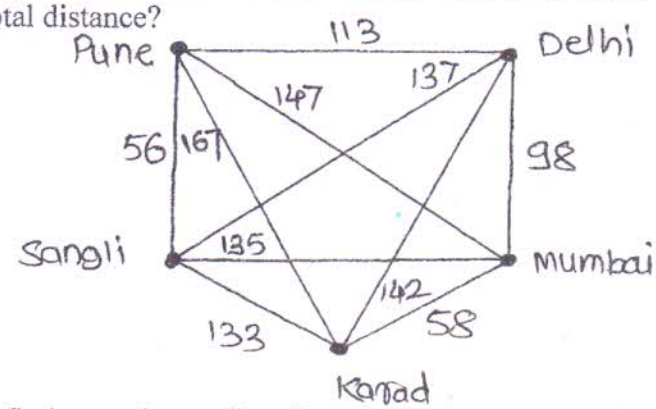
Time : 10.00 A.M. TO 1.00 P.
Max. Marks : 70

N. B. :

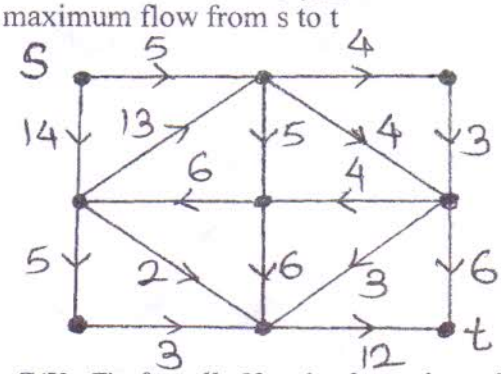
1) Each question carries **FOURTEEN** marks.
2) **Q. No. 1** is **COMPULSORY.**
3) Attempt any **FOUR** questions from **Q. 2** to **Q. 7**
4) Use of **NON PROGRAMMABLE** scientific calculator is allowed.

Q. 1 **a)** Show that a connected graph G with n vertices must have at least n-1 edges. **(06)**

b) A traveling salesman wants to visit each of n cities exactly once and returns to his starting point. In which order should he visit these cities to travel the minimum total distance? Use any method. **(08)**

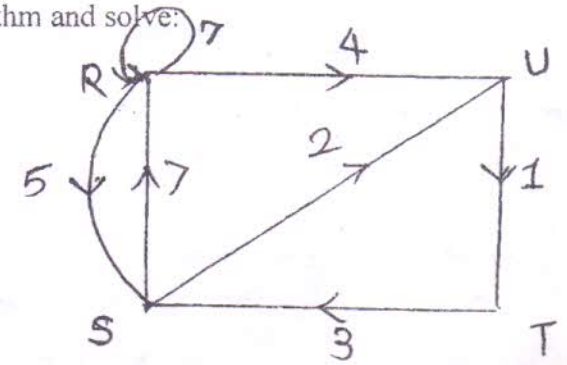


Q. 2 **a)** In the network below, find a maximum flow from s to t **(07)**



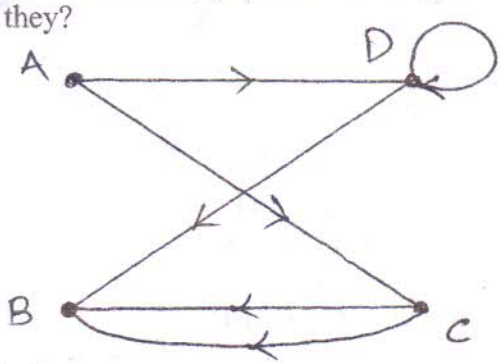
b) Draw a diagram for the $G = G(V, E)$ *for all* $V = \{a, b, c, d, e, f\}$, $E = [\{a, d\}, \{a, f\}, \{b, c\}, \{b, f\}, \{c, e\}]$ **(07)**

Q. 3 Describes Warshall's algorithm and solve: **(14)**



P. T. O.

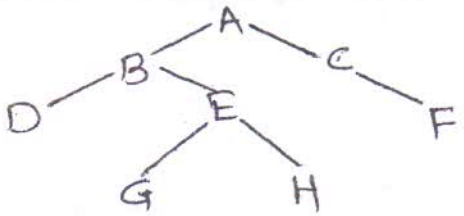
Q. 4 a) Find the number of vertices and edges; are there any multiple edges or loops? If so, what are they? (07)



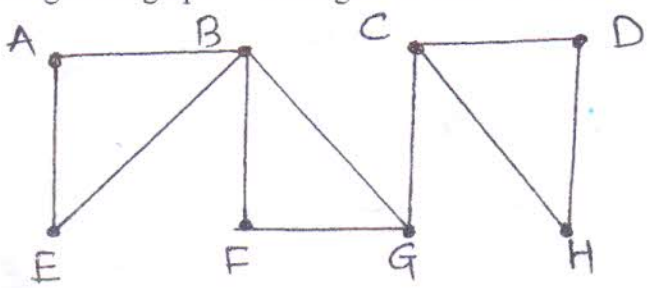
b) For the given tree T find : (07)

i) Depth of T

ii) List the nodes of T in preorder, inorder, postorder

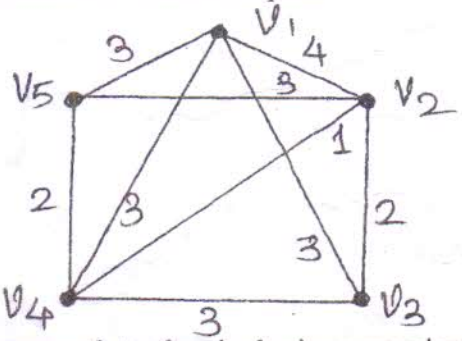


Q. 5 a) Define degree of graph? Find degree of each vertices for below graph: (07)



b) Draw the two, 3 – regular graphs with eight vertices. (07)

Q. 6 a) Apply Kruskal's algorithm to determine a shortest path. (07)



b) Draw the 2 – tree T which corresponds to the algebraic expression (07)
$E = (a + 2b)^4 / (c - 7d)$ and find preorder of T.

Q. 7 Write short notes on **ANY TWO** of the following: (14)

a) Merge algorithm

b) Eulerian circuit

c) Coloring of graphs

d) Directed and Undirected graph

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AMOOR- III (2010 Course) : OCT. / NOV. - 2013

Subject : Operating System Concepts

13

Day : Friday
Date : 08/11/2013

15329

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 1

N.B.:

1) **Q. No. 1** is **COMPULSORY.**
2) Attempt any **FOUR** questions from questions **Q. No. 2 to Q. No. 7**

Q.1 **a)** Consider the following set of processes with the length of CPU burst time and arrival time given in milliseconds **(07)**

Process	Burst Time	Arrival Time
P_1	5	1
P_2	1	0
P_3	2	2
P_4	4	3

Illustrate the execution of these processes using FCFS CPU scheduling algorithm. Also calculate waiting time, turnaround time of each process and calculate average waiting time and average turnaround time for above situation.

b) Explain file protection mechanism in operating system. **(07)**

Q.2 **a)** What is an operating system? Explain its importance. **(07)**

b) Explain segmentation with paging. **(07)**

Q.3 Describe various operating services for process management. **(14)**

Q.4 **a)** Define semaphore. Explain characteristics of semaphore. **(07)**

b) Explain layered structure of operating systems. **(07)**

Q.5 **a)** What is deadlock? Explain different method for recovery from deadlock. **(07)**

b) What is a role of page table? What are the contents of page table? **(07)**

Q.6 **a)** Explain First In First Out page replacement algorithm. **(07)**

b) Discuss any one method of disk space management. **(07)**

Q.7 Write short notes on Any **TWO** of the following: **(14)**

a) I/O device
b) User Authentication
c) File operations
d) Synchronous and Asynchronous message exchange

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Subject : Database Management with Oracle

14

Day : Monday
Date : 11/11/2013

15330

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 2

N.B.:

1) **Q. No. 1 is COMPULSORY.**
2) Attempt any **FOUR** questions from **Q. No. 2 to Q. No. 7.**
3) Each question carries **14** marks.

Q.1 **a)** Explain the different DDL commands with example. **(07)**

b) Explain the different SET operations in SQL. **(07)**

Q.2 **a)** What is cursor? Explain the steps of creating cursor. Give one example. **(07)**

b) Write a PL/ SQL block to check whether an entered number is Armstrong or not? **(07)**

Q.3 **a)** Consider the following database: **(07)**
Emp (ENo*, EName, Designation, Salary, PNo)
Project (PNo*, PName, PType)
i) Create above tables with proper constraints
ii) Display employees whose salary is less than 30000.00.
iii) Delete employees who are working on 'ERP' project.

b) Write a PL/SQL block to display employee details who are working on 'SAP' project using cursor on above database (Q.3 (a)). **(07)**

Q.4 **a)** Explain Arithmetic, Logical and Relational operators with example. **(07)**

b) Consider the following database **(07)**
Student (SNo*, SName, Marks, Extraactivity)
Write a PL/ SQL block to raise marks of the students by 5% who is having extra activity as 'National player'.

Q.5 **a)** Differentiate between: **(07)**
i) GROUP BY and ORDER BY Clause
ii) HAVING and WHERE Clause

b) What is index? Explain the different types of indexes. **(07)**

P. T. O.

15

Q.6 Consider the following database and solve the queries:

empCompany (EName*, CName, Salary, JDate)
Company (CName*, City)
Manager (EName, MName*)
empShift (EName, Shift)

i) List name of employees living in city 'Nagar'.
ii) List name of employees having company 'ACC'.
iii) Display the cities in which 'TATA' company is located.
iv) Give name of employees having manager 'Vijay'.
v) List the name of employees who are not employee in company 'ACC'.
vi) Display shift-wise employees.
vii) Display the names of employees who is working in 'Night' shift and having salary greater than 20,000.00

Q.7 **a)** Explain the various date functions used in SQL.

b) Write a short note on:
i) Self Join .
ii) Nested Queries

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AMOOR- III (2010 Course) : OCT. / NOV. - 2013

Subject : Visual Programming

16

Day : Wednesday
Date : 13/11/2013

15331

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 1

N.B.

1) Q. No. 1 is **COMPULSORY.**
2) Attempt any **FOUR** questions from Q.No.2 to Q. No.7.
3) Each question carries 14 marks.

Q.1 **a)** Explain different features of VB which force it to become Event driven programming. (07)

b) Design a form using VB to perform basic arithmetic operations using Combo Box. (07)

Q.2 **a)** What are functions? Why it is necessary? Explain different types of functions used in VB in detail. (07)

b) Explain the use of Data Grid Control. (07)

Q.3 Explain various controls in VB with their important properties, events and methods. (14)

Q.4 What are different types of errors? What are the techniques to handle errors in VB? (14)

Q.5 **a)** Explain different data controls used in VB to access data. (07)

b) Write data manipulation program using DAO for following table. (07)
employee (empno, empname, birth-date, place)
Note: Use add, delete, first ,last, previous, next buttons.

Q.6 Design a simple word processor using VB which allow the user to set the font name with radio buttons font styles with check boxes and font size with horizontal scroll bar. (14)

Q.7 Write short notes on (**ANY TWO**) (14)

i) Dialogue Boxes
ii) Visual data Manager
iii) Data Reports

* * *

Subject : Management-III (Financial Accounting)

17

Day : Saturday
Date : 16/11/2013

15332

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 2

N.B.:

1) Q. No. 1 is **COMPULSORY.**
2) Attempt any **FOUR** questions from Q. No. 2 to Q. No. 7.
3) Each question carries **FOURTEEN** marks.

Q.1 **a)** Journalise the following transactions in the books of Ajit Traders, Delhi for April 2010.

Date	Transactions
April-1	Ajit started business with cash Rs.80,000 and goods worth Rs.20,000.
April-2	Deposited in to Bank Rs.60,000.
April-8	Purchased goods from Sahil & Co. worth Rs.30,000.
April-10	Cash sales Rs.20,000.
April-12	Sold goods to Nitin worth Rs.40,000.
April-19	Personal expenses Rs.5,000.
April-25	Salary paid was Rs.15,000.

b) Explain the importance of subsidiary books. Explain any two subsidiary books with format.

Q.2 Explain Management Accounting. Distinguish between financial accounting and management accounting.

Q.3 Explain the concept and importance of ratio analysis with advantages and limitations.

Q.4 Explain the concept of Marginal Costing with its advantages and limitations.

Q.5 Define Budgetary Control. Also explain its advantages and limitations.

P.T.O.

18

Q.6 Given below is a Trial balance of Mr. Rahul as on 31st March 2010.

Particulars	Debit Bal. (Rs.)	Credit Bal. (Rs.)
Cash in hand	6,800	
Sundry debtors	22,500	
Bills receivable	10,000	
Stock (on 1.4.2009)	16,700	
Purchases	37,200	
Loan from Bank		20,000
Sundry creditors		15,000
Sales		65,800
Purchase returns		2,200
Sales returns	800	
Salaries	11,000	
Wages	2,000	
Printing and Stationary	3,200	
Commission	1,000	
Bills Payable		8,200
Discount		2,300
Capital		56,500
Machinery	41,000	
Carriage Inward	1,500	
Insurance	1,800	
Drawings	2,500	
Octroi duty	800	
Furniture	8,000	
Office Rent	3,200	
Total Rs.	**1,70,000**	**1,70,000**

Prepare Trading and Profit and Loss A/c for the year ended 31st March 2010 and Balance Sheet as on that date considering the following Adjustments.

a) Stock of goods on 31st March 2010 valued at Rs.21,000.
b) Outstanding salaries were Rs.1,000 and Printing and Stationary Rs.800.
c) Prepaid insurance Rs.600.
d) Furniture is to be depreciated at Rs.15%.

Q.7 Write short notes on any TWO of the following:

a) Importance of Tally Package
b) Objectives of cost accounting
c) Separate legal entity
d) Margin of safety.

* * *

Subject : Mathematics-III (Graph Theory)

Day : Tuesday
Date : 19/11/2013

15333

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 2

N.B.:

1) **Q. No. 1** is **COMPULSORY**.
2) Attempt any **FOUR** questions from **Q. No. 2 to Q. No. 7.**
3) Each question carries **FOURTEEN** marks.
4) Use of non programmable scientific **CALCULATOR** is allowed.

Q.1 a) Draw Tree T for algebraic expression.

$E = \sqrt{(a+b)+(a-9b)^2}$.

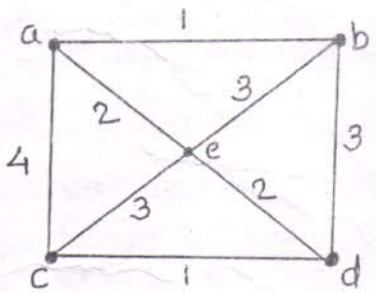
b) Discuss 'Decomposition of graph' with suitable example.

Q.2 Write note on weighted graph and then draw a weighted graph G. Which is maintained in memory by DATA array ,weight matrix is below:

Data : X, Y, S, T $W = \begin{bmatrix} 0 & 0 & 3 & 0 \\ 5 & 0 & 1 & 7 \\ 2 & 0 & 0 & 4 \\ 0 & 6 & 8 & 0 \end{bmatrix}$

Q.3 a) Write Algorithm to find Minimal Spanning tree by Kruskal's Algorithms.

b) Use Kruskal's Algorithm to find minimum spanning tree.



Q.4 Illustrate concept of 'matrix representation of Graphs' with the help of following points:

i) Incidence matrix
ii) Adjacency matrix
iii) Example

P. T. O.

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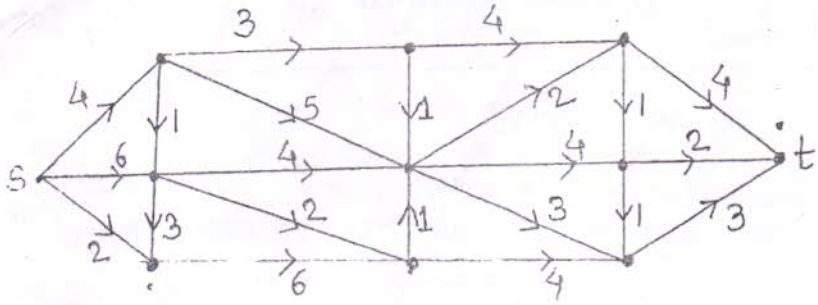
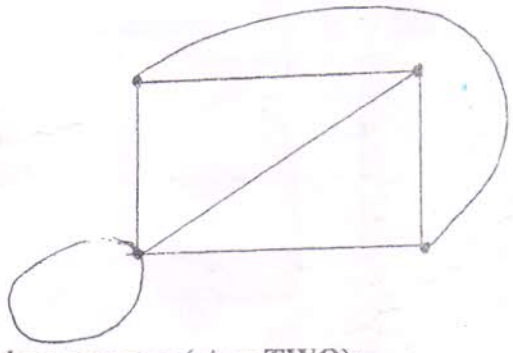
Q.5 Use the pruning algorithm to find the shortest path from s to t .



Q.6 **a)** What is chromatic number? How many colors are required to make give graph colorful. (Use suitable method)



Q.7 Write short notes on (Any **TWO**):

a) Enumeration of Tree

b) Planner graph

c) Appel and Haken Algorithm

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AMOOR- III (2010 Course) : WINTER - 2014

Subject : Operating System Concepts

Day : Saturday
Date : 15/11/2014

20743

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 1

N.B:

1) Q. No.1 is **COMPULSORY.**
2) Attempt **ANY FOUR** questions from Q. No. 2 to Q. No. 7.
3) Figures to the **RIGHT** indicate full marks.

Q.1 Consider the following set of processes with the length of the CPU burst time given in milliseconds. **(14)**

Process	Burst Time
P1	10
P2	1
P3	2
P4	3
P5	5

Assume that all processes arrived at time 0. Draw Gantt chart and calculate average waiting time using-

i) FCFS scheduling algorithm.
ii) SJF scheduling algorithm.

Q.2 **a)** List different functions of operating system and explain each in brief. **(07)**

b) Define file. Explain different file attributes. **(07)**

Q.3 **a)** Define operating system. List different types of operating systems and explain any one of them. **(07)**

b) Explain with neat diagram short term, middle term and long term scheduler. **(07)**

Q.4 **a)** What is deadlock and give the necessary conditions for occurrence of deadlock. **(07)**

b) Define process. Explain different process state transitions with neat diagram. **(07)**

Q.5 **a)** Explain with neat diagram concept of internal and external fragmentation. **(07)**

b) What is Semaphore? Explain how mutual exclusion is achieved using Semaphore. **(07)**

Q.6 **a)** Differentiate between paging and segmentation. **(07)**

b) List different page replacement algorithms and explain any two of them. **(07)**

Q.7 Write a note on **ANY TWO:** **(14)**

a) Layered operating system structure
b) Device controllers
c) DMA
d) Directory operations

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Subject : Database Management with Oracle

Day : Monday
Date : 17/11/2014

20744

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 1

N.B.:

1) **Q. No. 1** is **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Attempt any **FOUR** questions from **Q. No. 2 to Q. No. 7.**

Q.1 **a)** Explain SELECT command with all clauses. (07)
b) What is CURSOR? Explain its different attributes. (07)

Q.2 Consider following table and solve the following queries. (14)
Student (RollNo NUMBER, Name CHAR (30), Course VARCHAR (20), Fees NUMBER (6,2))

i) Create above table
ii) Alter table and apply primary key to RollNo column
iii) Alter table and increase the column size of Name by 40.
iv) Add new column year with data type NUMBER.
v) Create the table student_New with the same structure of student using SELECT command.
vi) Display the name of the students whose course begins with 'B'.
vii) Remove all the records of student whose fees is greater than 5000.

Q.3 **a)** Explain GRANT command with all options. (07)
b) Differentiate between UNIQUE and PRIMARY KEY constraint. (07)

Q.4 **a)** Write a PL/SQL block to display the content of student table of Q.2. (07)
b) Describe any FIVE aggregate functions with example. (07)

Q.5 **a)** Explain different SET operations. (07)
b) Write a PL/ SQL block to check whether entered number is negative, positive or zero. (07)

Q.6 Write a Procedure on following table to find the five employees with the highest sales amount and print their names along with total sales for each. (14)
EMP (ID, Name, SalesAmt, Dept).

Q.7 Write short notes on any **TWO** of the following: (14)

a) Data models
b) Views
c) Import / Export command

* * * * *

Subject : Visual Programming

Day : Tuesday
Date : 18/11/2014

20745

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 1

N.B.:

1) **Q.No. 1** is **COMPULSORY**. Attempt any **FOUR** of the remaining.
2) Figures to the right indicate full marks.
3) All questions carry equal marks.

Q.1 **a)** Write a VB program to design a simple calculator using control array. **[07]**

b) Differentiate between object oriented programming and Event driven programming. **[07]**

Q.2 Explain the functionality of the following controls. **[14]**

a) Scrollbar
b) Timer control
c) Picture box
d) Textbox control

Q.3 **a)** What do you mean by function? Explain five string functions. **[07]**

b) Explain in detail msgbox and Input box. **[07]**

Q.4 Design a VB form consisting of a menu named courses. Courses menu consists of two submenus BBA, BCA. By selecting an appropriate submenu respective information should display on separate form. Write code for all controls. **[14]**

Q.5 What is Error handling in VB? Explain different types of Errors. **[14]**

Q.6 Differentiate between:- **[14]**

a) Random and Sequential file access
b) Check box and Option button

Q.7 Write short note any **TWO** of the following: **[14]**

a) Data types in VB
b) Data Reports
c) ADO

* * * * *

Subject : Management-III (Financial Accounting)

Day : Wednesday
Date : 19/11/2014

20746

Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 2

N. B. :

1) Q. No. **1** is **COMPULSORY**.
2) Attempt **ANY FOUR** questions from Q. No. **2** to Q. No.**7.**
3) All questions carry **EQUAL** marks.
4) Use of non-programmable calculator is **ALLOWED**.

Q. 1 **a)** Explain of Accounting Concepts and Accounting Conventions.

b) Journalize the following transactions in the books of Avani for the year 2012.

Jan 11st Avani Commenced Business with cash Rs. 8,00,000/-

Jan 22nd Purchased goods for cash Rs. 1,00,000/-

Jan 23th Purchased goods from Swati Rs. 80,000/- and paid half amount in cash.

Jan 28th Paid salary Rs. 25,000/-

Jan 29th Sold goods for cash Rs. 1,50,000/-

Q. 2 Distinguish between Financial Accounting and Cost Accounting.

Q. 3 Explain the meaning and objectives of Budgetary control also give advantages of Budgetary control.

Q. 4 Explain the Material variance and Labour variance with suitable examples.

Q. 5 Explain Liquidity Ratio and Profitability Ratio.

Q. 6 Write short notes on **ANY TWO** of the following:

a) Tally Package

b) Trial Balance

c) Flexible Budget

d) P/V Ratio

P. T. O.

Q. 7 From the following Trial Balance and additional information, you are required to prepare a Trading and Profit and Loss Account and Balance sheet as on 31st December, 2012

Particulars	Dr. Amount	Cr. Amount
Capital		4,00,000
Sundry Debtors	1,08,000	
Drawings	36,000	
Machinery	1,40,000	
Sundry Creditors		56,000
Wages	2,00,000	
Purchases	3,80,000	
Opening stock	80,000	
Bank Balance	60,000	
Carriage charges	6,000	
Salaries	8,000	
Rent and Taxes	18,000	
Sales		5,80,000
	10,36,000	**10,36,000**

Additional Information :

a) Closing Stock Rs. 24,000/-

b) Outstanding Rent and Taxes Rs. 2,000/-

c) Charge depreciation on Machinery 10%

* * * * *

AMOOR- III (2010 Course) : WINTER - 2014

Subject : Mathematics-III (Graph Theory)

Day : Thursday
Date : 20/11/2014

20747

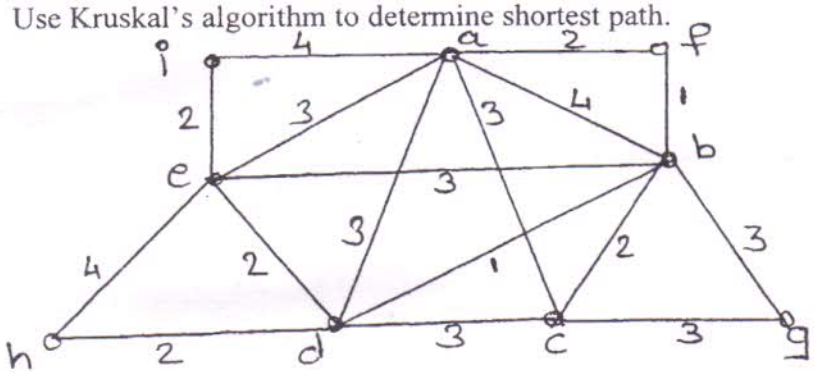
Time : 10.00 AM TO 01.00 PM
Max Marks : 70 Total Pages : 3

N.B.:

1) Q. No. **1** is **COMPULSORY**.
2) Attempt ANY FOUR questions from Q. No. **2** to Q. No. **7.**
3) Each question carries **FOURTEEN** marks.
4) Use of non programmable scientific **CALCULATOR** is allowed.

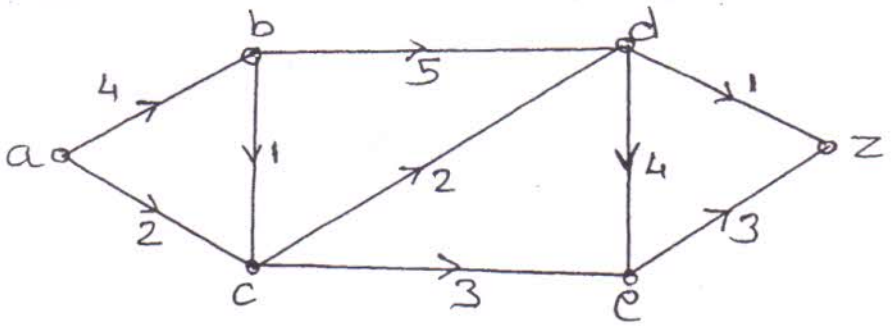
Q.1 **a)** Draw a Graph for the $G = G(V, E)$ for all $V = \{A, B, C, D\}$
$E = [\{A, B\}, \{D, A\}, \{C, A\}, \{C, D\}, \{B, D,\}, \{C, B\}\ ]$

b) Use Kruskal's algorithm to determine shortest path.



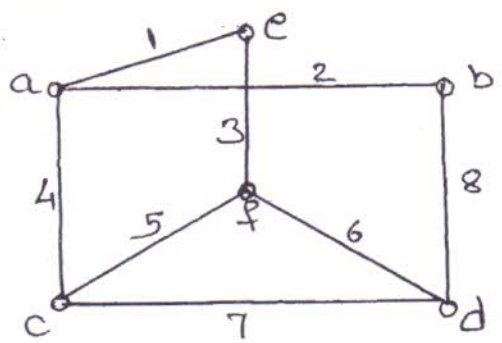
Q.2 **a)** Write a brief note on: K – chromatic graph.

b) Explain Dijkstra's Algorithm. Find the length of shortest path between A to Z.



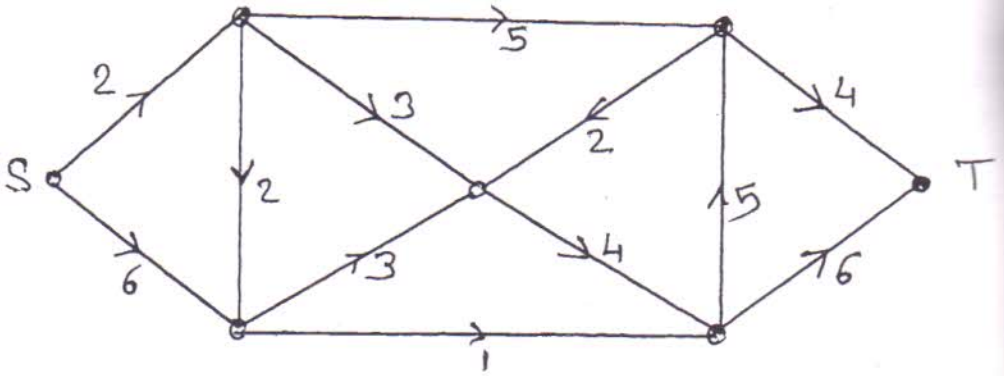
Q.3 **a)** Find out the following? Explain it.

i) Adjacency matrix
ii) Incidence matrix

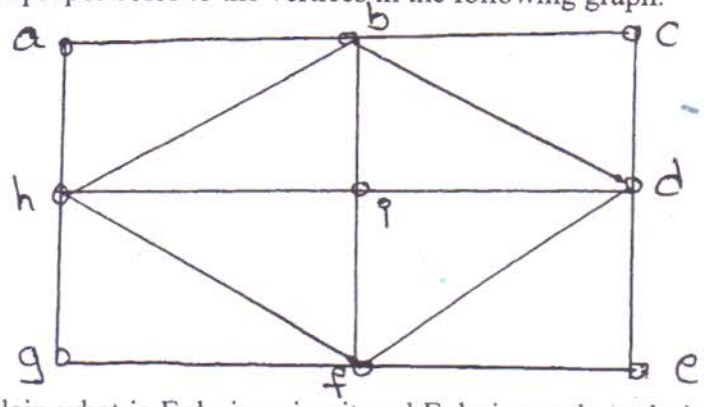


P.T.O.

b) In the network below, find maximum flow from s to t.

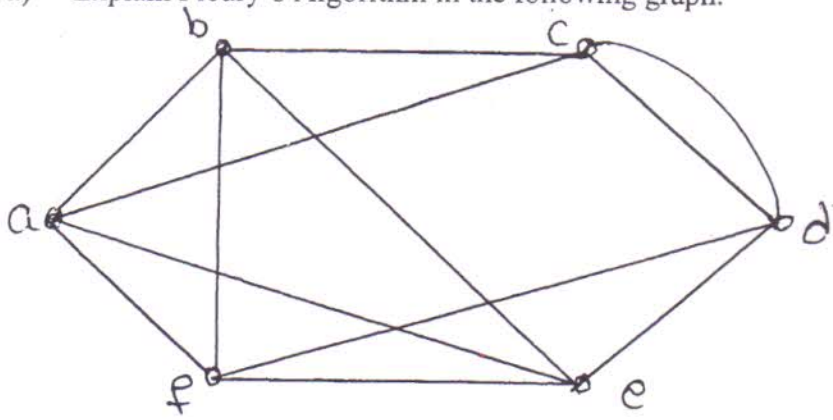


Q.4 **a)** Give proper color to the vertices in the following graph.



b) Explain what is Eulerian circuit and Eulerian path, and give the condi
find the Eulerian circuit or path.

Q.5 **a)** Explain Fleury's Algorithm in the following graph.



b) Explain Depth first search algorithm with suitable example.

Q.6 Write short note on **ANY TWO** of the following:

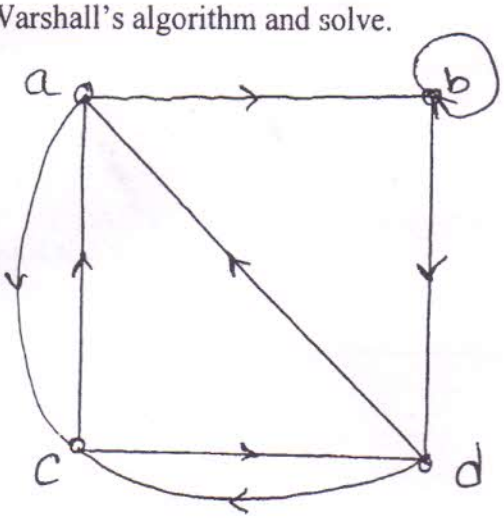
a) Planner graph

b) Graceful labeling

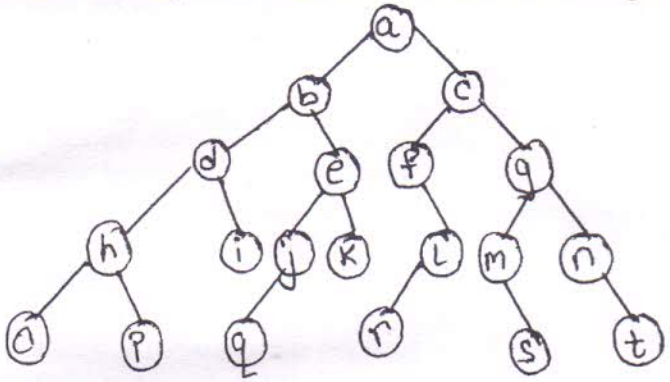
c) Maximum matching

20747

Q.7 **a)** Describe Warshall's algorithm and solve.



b) Find Pre-order, Post-order and In-order from tree given below.



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AMOOR- III (2014 Course) : WINTER - 2015

Subject : Operating Systems

Day : Friday
Date : 20/11/2015

26315

Time : 02.00 PM TO 05.00 PM
Max Marks : 100 Total Pages : 1

N.B:

1) Answer **ANY FOUR** questions from Section-I and **ANY TWO** questions from Section-II.
2) Both the sections should be written in the **SAME** answer book.
3) Figures to the **RIGHT** indicate full marks.

SECTION-I

Q.1 Differentiate between: **(15)**
a) Online operating system Vs Real time operating system.
b) Memory management with bitmap Vs Memory management with linked list.
c) Implicit tasking and Explicit tasking.

Q.2 Explain the following terms: **(15)**
a) Process control block
b) File access methods
c) Process relationships.

Q.3 What is segmentation? Explain the concept of pure segmentation in detail. **(15)**

Q.4 What is semaphore? Why it is necessary? Discuss the implementation of semaphore. **(15)**

Q.5 What is deadlock? Explain conditions for deadlock occurrence. How to detect and recover the system from deadlock. **(15)**

Q.6 Explain the concepts of file. Discuss various file protection mechanisms in detail. **(15)**

Q.7 Write short notes on: **(15)**
a) Disk scheduling
b) Reusable and consumable resources
c) System programs

SECTION-II

Q.8 Consider the memory with six page frames (0-5). R bit values are given below for each page. **(20)**
R bit value at clock tick 0 : 010010
R bit value at clock tick 1 : 011011
R bit value at clock tick 2 : 110110
R bit value at clock tick 3 : 010101
R bit value at clock tick 4 : 111110
R bit value at clock tick 5 : 110011
R bit value at clock tick 6 : 110001
R bit value at clock tick 7 : 101010
By using LRU with aging (simulation of LRU in software) Find out page to be replaced at end. Also explain the algorithm in detail.

Q.9 Consider the following case: **(20)**

Process	Arrival time	Execution time (in ms)
P1	10.00	6
P2	10.03	2
P3	10.04	1
P4	10.07	5

Calculate average waiting and turnaround time in case of
a) First come first served
b) Shortest job first
c) Round Robin

Q.10 a) What are the operations performed by the operating system on a process right from its creation to termination. Explain each of them. **(10)**
b) Explain the concept and need of multiprocessing operating system. **(10)**

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Subject : Software Engineering

Day : Monday
Date : 23/11/2015

26316

Time : 02.00 PM TO 05.00 PM
Max Marks : 100 Total Pages : 1

N.B.

1) Answer any **FOUR** questions from Section – I and any **TWO** questions from Section - II.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SAME** answer book.

SECTION – I

Q.1 What are Principles of Software Engineering? Explain in brief Program and Software. **(15)**

Q.2 Explain Waterfall Model with stages in Waterfall Model of Software Process. Explain each stage in brief. **(15)**

Q.3 Why Feasibility Study is required? Explain types of Feasibility Study in Software Development Process. **(15)**

Q.4 Explain concept of PERT and GANTT charts for Software Project Management. Explain Planning and Execution phase in Software Project Management. **(15)**

Q.5 Write detail note on Function Oriented and Object Oriented Modeling with respect to Constructing Solution to a Problem. (Assume any Business Problem) **(15)**

Q.6 What is Software Testing? Explain different Software Testing Techniques in brief. **(15)**

Q.7 Write short notes on the following: **(15)**

a) Quality Control and Quality Assurance
b) Categories of Software Maintenance
c) Software Development Life Cycle

SECTION – II

Q.8 Draw the Entity Relationship Diagram and Context Level Data flow Diagram for Hospital Management System. (Assume appropriate processes in Hospital Management System) **(20)**

Q.9 Explain Requirement Engineering in detail with respect to types of Requirements. **(20)**

Q.10 a) What are Characteristics of SRS (Software Requirement Specification) ? Explain need of SRS document. **(10)**

b) Explain Cost Benefit Analysis in Brief. **(10)**

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AMOOR- III (2014 Course) : WINTER - 2015

Subject : Data Structures

Day : Thursday
Date : 26/11/2015

26317

Time : 02.00 PM TO 05.00 PM
Max Marks : 100 Total Pages : 1

N.B.:

1) Attempt any **FOUR** questions from Section -I.
2) Attempt any **TWO** questions from Section – II.
3) Figures to the right indicate **FULL** marks.
4) Answers to both the sections should be written in **SAME** answer book.

SECTION-I

Q.1 Explain the applications of stack with example. **(15)**

Q.2 Explain in detail any three sorting techniques. **(15)**

Q.3 Explain Advantages and disadvantages of Linked list. **(15)**

Q.4 What is Data structure? Explain types of data structures. **(15)**

Q.5 What is Queues? Explain types of queues. **(15)**

Q.6 Write a program to allocate memory dynamically for string and store their addresses in array of pointers to string. **(15)**

Q.7 Explain the terms: **(15)**

i) Inorder Traversal
ii) Preorder Traversal
iii) Postorder Traversal

SECTION-II

Q.8 Write a program to implement depth first search algorithm. **(20)**

Q.9 Write a program to sort 20, 35, 40, 100, 3, 10, 15 using insertion sort. **(20)**

Q.10 Write program to find specific element from the array using binary search. **(20)**

* * * *

Subject : Mathematics

Day : Saturday
Date : 28/11/2015

26318

Time : 02.00 PM TO 05.00 PM
Max Marks : 100 Total Pages : 2

N.B.:

1) Attempt any **FOUR** questions from Section –I and any **TWO** questions from Section –II.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SAME** answer book.

SECTION-I

Q.1 **a)** Find $A X B X C = ?$ **(08)**

If $A = \begin{bmatrix} -1 & 2 & 3 \\ 1 & -1 & 5 \\ 6 & 2 & 3 \end{bmatrix}$ $B = \begin{bmatrix} 5 & 2 & 3 \\ 0 & 1 & 0 \\ -1 & -2 & -3 \end{bmatrix}$

and $C = \begin{bmatrix} 6 & 5 & 4 \\ 5 & 4 & -2 \\ 4 & -3 & 1 \end{bmatrix}$.

b) $A^2 + BI - C.$ **(07)**

Q.2 What is proposition and truth table? Construct truth table for $\sim(p \wedge q) \vee (\sim q \vee r)$. **(15)**

Q.3 Let $V = \{1, 2, 3, 4\}$ and **(15)**

$f = \{(1,3), (2,1), (3,4,), (4,3)\}$ and

$g = \{(1,2), (2,3), (3,1,), (4,1)\}$.

Find: i) f o g ii) g o f iii) f o f

Q.4 For each pair of integers a and b, find integers q and r such that **(15)**

$a = bq + r$ and $0 \leq r < |b|$

i) $a = 258$ and $b = 12$ ii) a = 573 and $b = -16$

Q.5 Prove that: **(15)**

i) $(A \cup B)' = A' \cap B'$ For any A and B for universal set U.

ii) prove above expression by venn diagram.

Q.6 Define 'Symmetric relation'. Give an example of a symmetric relation. Give an example of a relation that is not symmetric. **(15)**

P. T. O.

Q.7 Write short notes on the following: (15

a) Counting principle

b) Minimal Boolean expressions

c) Closure properties

SECTION-II

Q.8 a) Draw logic circuit for output Y
Here $Y = A'BC + AB'C' + AB'$.

b) Write note on (Any **TWO**)
i) NAND gate
ii) NOR gate
iii) Prime implicate

Q.9 In a class of 80 students, 50 students know English, 55 know French and 46 know German languages. 37 students know English and French, 28 students know French and German, 25 students know English and German. 7 students know non of these languages. Find out.

i) How many students know all 3 languages?

ii) How many know only one language?

Q.10 Find the g.c.d. of

a) 45, 34 b) 77, 128

c) 258, 60 d) 152, 80

using Euclidean algorithm.

* * * *

AMOOR- III (2010 Course) : WINTER - 2015

Subject : Operating System Concepts

Day : Friday
Date : 20/11/2015

26329

Time : 02.00 PM TO 05.00 PM
Max Marks : 70 Total Pages : 1

N.B.:

1) Q. No. 1 is **COMPULSORY.**
2) Attempt any **FOUR** questions from **Q. No. 2 to Q. No. 7.**

Q.1 a) Find average waiting time using First Come First Serve scheduling algorithm for the following processes, assume that all processes are arrived of time interval 0. **(07)**

Process	Execution Time
P_0	5
P_1	3
P_2	8
P_3	6

b) Explain with neat diagram Distributed Operating System. **(07)**

Q.2 a) What is Operating System? Explain multiprogramming operating system. **(07)**

b) Explain with neat diagram Process Control Block. **(07)**

Q.3 Explain in brief different functions of Operating System. **(14)**

Q.4 Explain with neat diagram how logical address is converted to physical address. **(14)**

Q.5 a) List different page replacement algorithms and explain any one in detail. **(07)**

b) Explain the concept of swapping with help of diagram. **(07)**

Q.6 a) Explain how memory management is done using bit-maps. **(07)**

b) Explain C-SCAN and C-LOOK disk scheduling algorithms. **(07)**

Q.7 Write short notes on **ANY TWO** of the following: **(14)**

a) Semaphores
b) Deadlock
c) DMA
d) File Security

* * * *

AMOOR- III (2010 Course) : WINTER - 2015

Subject : Database Management with Oracle

Day : Monday
Date : 23/11/2015

26330

Time : 02.00 PM TO 05.00 PM
Max Marks : 70 Total Pages : 1

N.B.:

1) **Q.No.1** is **COMPULSORY**.
2) Attempt **ANY FOUR** questions from **Q.No.2** to **Q.No.7**.
3) Each question carries **14** marks.
4) Draw neat and labeled diagrams **WHEREVER** necessary.

Q.1 Explain SELECT statement with all options. **[14]**

Q.2 **a)** Explain different DDL commands with example. **[07]**

b) What is sequence? How to create sequence in oracle? **[07]**

Q.3 Explain different constraints used in oracle with example. **[14]**

Q.4 Write a PL/SQL block that finds the five employees with the highest sales figure and print their numbers and names along with total sales of each. **[14]**
Emp (ID, NAME, SALES_AMT, DEPT).

Q.5 Write a PL/SQL block using cursor to fetch the data from student and enrollment table and have a student_id less than 100 and count the no. of courses they enrolled **[14]**
Student (studid, last_name, first_name, city)
Enrollment (Id, studid, course, enroll_date)

Q.6 **a)** Consider the following database and solve the queries: **[07]**
Emp (eno, ename, designation, salary, Pno)
Project (Pno, pname, ptype)

i) Create above tables with proper constraints.
ii) Display employee names whose salary is less than 30,000/-.
iii) Delete the records of employees who are working on 'ERP' project.
iv) Update an employee name whose eno = 10

b) Write a PL/SQL block to display employee details who are working on 'SAP' project. **[07]**

Q.7 Write short notes on **ANY TWO** of the following: **[14]**

a) Stored procedure

b) Function

c) Trigger

* * * *

Subject : Visual Programming

Day : Thursday
Date : 26/11/2015

26331

Time : 02.00 PM TO 05.00 PM
Max Marks : 70 Total Pages : 1

N.B.:

1) **Q.No. 1** is **COMPULSORY**. Attempt any **FOUR** of the remaining.
2) Figures to the right indicate full marks.
3) All questions carry equal marks.

Q.1 **a)** Write a VB program to check whether the given number is armstrong or not. Give an appropriate message. **[07]**

b) Explain following VB IDE components: **[07]**

i) Menu bar
ii) Tool box
iii) Project Explorer
iv) Properties window

Q.2 What is control array? Explain how control array can be implemented at run time with example. **[14]**

Q.3 **a)** What do you mean by function? Explain any five Date and Time functions. **[07]**

b) Explain the following control statements: **[07]**

i) If statement
ii) Select case

Q.4 As a programmer how do you create menus and submenus in VB? Also discuss the importance of menu. **[14]**

Q.5 **a)** Write a note on Data Reports **[07]**

b) Explain the concept of MDI. **[07]**

Q.6 Differentiate between:- **[14]**

a) Random and Sequential file access
b) List box and Combo box control

Q.7 Write short note any **TWO** of the following: **[14]**

a) Label control and Text box control
b) Error Handling in VB
c) Data bound control

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Subject : Management-III (Financial Accounting)

Day : Saturday
Date : 28/11/2015

26332

Time : 02.00 PM TO 05.00 PM
Max Marks : 70 Total Pages : 1

N.B:

1) Each question carries **FORTEEN** marks.
2) Q No.1 is **COMPULSORY**.
3) Attempt **ANY FOUR** questions from Q.2 to Q.7.
4) Use of non-programmable scientific **CALCULATION** is allowed.

Q.1 a) Enter the following transactions in the Journal of Das Electrical for the month of July 2014 **(07)**

Date	
1.July	Das started business with cash Rs 10, 00,000 of which Rs 450,000 was taken as a loan from Gangadhar.
10.July	Bought 10 mixers from Rico company @ Rs 1000/- each
15.July	Received Re 5000 as interest on Investment.
20.July	Paid salary Rs 15000/-

b) Describe the Functions of financial Accounting. **(07)**

Q.2 Explain in detail Accounting Concepts and Conventions. **(14)**

Q.3 Define Management Accounting. Explain the nature, scope of Management Accounting. **(14)**

Q.4 Explain the standard costing with various Advantages and limitations. **(14)**

Q.5 Explain concept of Marginal Costing with its Advantages and limitations. **(14)**

Q.6 The Expenses budgeted for production of 10,000. Units in a factory are given below. **(14)**

	Per Units (Rs.)
Materials	70
Labour	25
Variable Cost	20
Fixed overheads(Rs. 100,000)	10
Variable expenses (Direct)	05
Selling expenses(10% fixed)	13
Distribution Expenses (20% fixed)	07
Administration Expenses Rs(50,000)	05
Total	**155**

Prepare Budget for the production of a 8000 Units and 6000 Units.

Q.7 Write short notes:**(ANY TWO)** **(14)**

a) Subsidiary books
b) Tally Fundamentals
c) Types of Ratio
d) Break even point

* * * *

AMOOR- III (2010 Course) : WINTER - 2015

Subject : Mathematics-III (Graph Theory)

Day : Tuesday
Date : 01/12/2015

26333

Time : 02.00 PM TO 05.00 PM
Max Marks : 70 Total Pages : 2

N.B.:

1) **Q.No.1** is **COMPULSORY**.
2) Attempt **ANY FOUR** questions from **Q.No.2** to **Q.No.7**.
3) Figures to the right indicate **FULL** marks.

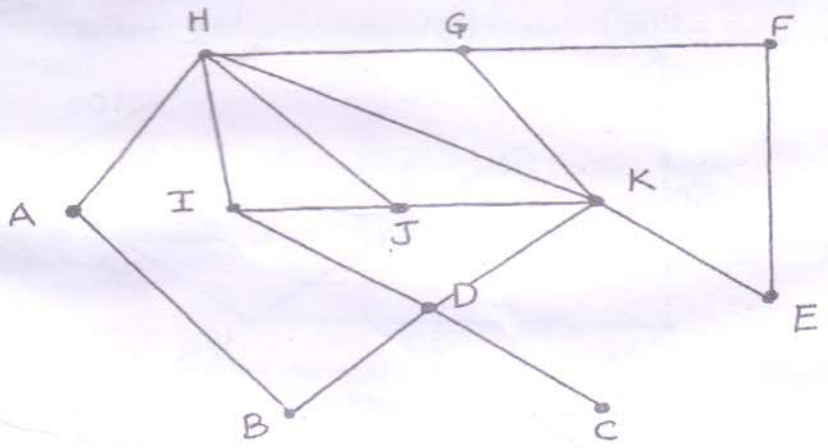
Q.1 a) Compare Eulerian Circuits and Euler's Path. **[07]**

b) Write steps involved in Breadth First Search (BFS) Algorithm. **[07]**

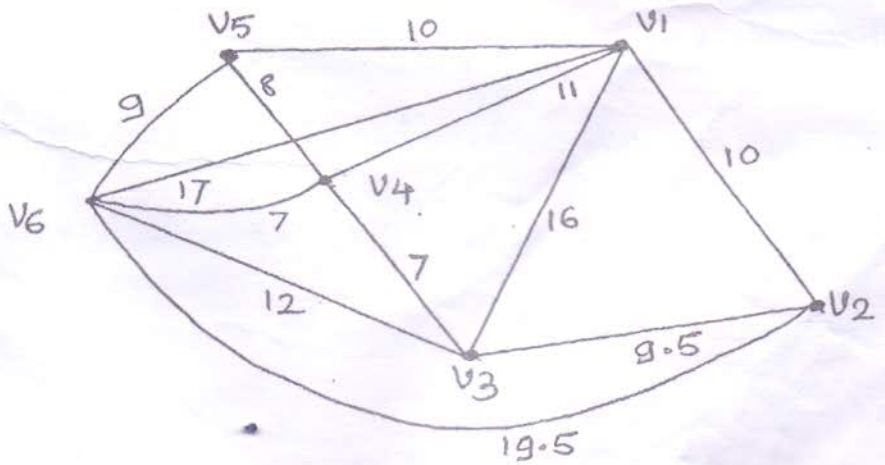
Q.2 Write short note on Isomorphic graph with suitable example. **[14]**

Q.3 a) What is chromatic number? **[07]**

b) How many colors are required to make given graph colourful. **[07]**



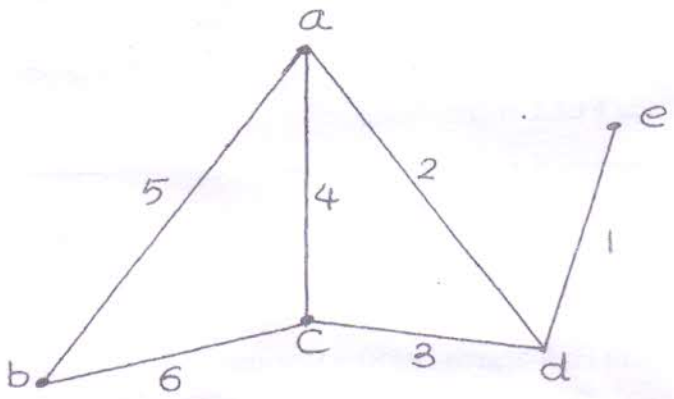
Q.4 Use the algorithm of Kruskal's, as outlined in study to find a shortest spanning tree in the graph given below. **[14]**



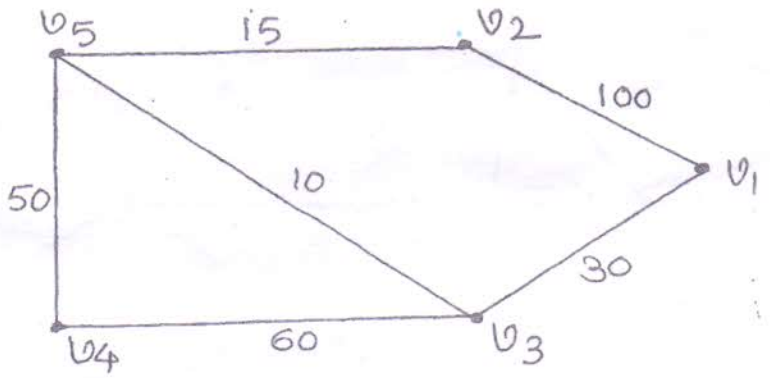
P.T.O.

Q.5 **a)** What is meant by spanning trees? [07]

b) Sketch all spanning trees of the given graph. [07]



Q.6 Apply Dijkastra algorithm to find the shortest path from vertex V_1 to V_5 in the graph shown in the figure below. [14]



Q.7 Write short notes on **ANY TWO** of the following:

a) Planer graphs

b) Directed graphs

c) Adjacency matrix

* * * *

AMOOR-III(2014 Course) CBCS : SUMMER - 2016

Subject : Operating Systems

Day : Tuesday
Date : 12/04/2016

29231

Time : 02.00 PM TO 05.00 PM
Max Marks : 100 Total Pages : 1

N.B:

1) Answer **ANY FOUR** questions from Section-I and **ANY TWO** questions from Section-II.
2) Both the sections should be written in the **SAME** answer book.
3) Figures to the **RIGHT** indicate full marks.

SECTION-I

Q.1 Explain various operating system structures with their merits and demerits. **(15)**

Q.2 Explain the following: **(15)**

a) Multilevel scheduling
b) Multilevel feedback scheduling
c) Process control block

Q.3 What is page table? Give the structure of page table entry. Explain the process of converting virtual addresses into physical addresses with suitable example. **(15)**

Q.4 Explain the file system structure in detail. **(15)**

Q.5 What is semaphore? Discuss characteristics and queuing implementation of semaphore. **(15)**

Q.6 What is deadlock? Describe deadlock detection methods with example. **(15)**

Q.7 Write short notes on: **(15)**

a) Fragmentation
b) Disk structure
c) Segmentation with paging

SECTION-II

Q.8 Consider the following case: **(20)**

Process	Arrival time	Execution time (min)
P1	10.00	08
P2	10.01	03
P3	10.07	02
P4	10.10	04

Calculate average waiting and turnaround time in case of.

a) First come first served
b) Shortest job first
c) Round robin

Q.9 Consider the following page reference string. **(20)**
1,2,3,4,0,2,3,2,1,0,4,3,2,4,3,0,1
Find out the page to be replaced at end using LRU with matrix. Also explain the algorithm.

Q.10 Explain the following: **(20)**

a) Distributed operating system.
b) Input Output interface.
c) Conditional critical region.
d) Operating system services.

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Subject : Software Engineering

Day : Saturday
Date : 16/04/2016

29232

Time : 02.00 PM TO 05.00 PM
Max Marks : 100 Total Pages : 1

N. B. :

1) Attempt **ANY FOUR** questions from Section –**I**. Each question carries **15**marks.
2) Attempt **ANY TWO** questions from Section –**II**. Each question carries **20** marks.
3) Answers to both the sections should be written in the **SAME** answer book.

SECTION - I

Q. 1 What are software engineering concepts? Explain principles and importance of software engineering. **(15)**

Q. 2 What is software project management? Explain software configuration in brief. **(15)**

Q. 3 Explain software development life cycle in brief. What are stages in SDLC? **(15)**

Q. 4 What is need of feasibility study? Explain in brief types of feasibility. **(15)**

Q. 5 What is requirement engineering? Explain in brief types of requirements. **(15)**

Q. 6 What are characteristics of SRS? Explain function oriented modeling in brief. **(15)**

Q. 7 Explain ERD concepts with example. What are benefits of flow charts? **(15)**

SECTION – II

Q. 8 What are concepts of Testing? Explain different testing techniques with example. **(20)**

Q. 9 What are quality concepts with respect to software? Explain in brief software quality assurance and software reviews. **(20)**

Q.10 Write short notes on **ANY TWO** of the following: **(20)**

a) Software maintenance
b) Object oriented design
c) Waterfall model

* * * * *

Subject : Data Structures

Day : Wednesday
Date : 20/04/2016

29233

Time : 02.00 PM TO 05.00 PM
Max Marks : 100 Total Pages : 1

N.B.:

1) Attempt **ANY FOUR** questions from Section – I and attempt **ANY TWO** questions from Section – II.
2) Answers to both the sections should be written in the **SAME** answer book.
3) Figures to the right indicate **FULL** marks.

SECTION – I

Q.1 Explain array of structure and structure within structure with example. **[15]**

Q.2 What is dynamic memory allocation? Write and explain memory allocation for structure with example. **[15]**

Q.3 Discuss the advantage of linked list over array with example. **[15]**

Q.4 What is stack? Explain it with its example. **[15]**

Q.5 Explain with example linked list implementation of queue. **[15]**

Q.6 Explain Breadth First Traversal and Depth First tree Traversal. **[15]**

Q.7 Write short notes on **ANY TWO** of the following: **[15]**

a) Circular linked list
b) Array
c) Atomic Data

SECTION – II

Q.8 Write C program to perform Binary Search using Recursion. **[20]**

Q.9 Write a C program to implement a stack using Linked List. **[20]**

Q.10 Write a C program to read n unsorted numbers to an array of size n and sort the numbers in descending order using insertion sort technique. **[20]**

* * * *

Subject : Mathematics

Day : Friday
Date : 22/04/2016

29234

Time : 02.00 PM TO 05.00 PM
Max Marks : 100 Total Pages : 2

N.B.:

1) Attempt **ANY FOUR** questions from Section- I and attempt **ANY TWO** questions from Section – **II.**
2) Figures to the right indicate **FULL** marks.
3) Both the sections should be written in the **SAME** answer book.

SECTION – I

Q.1 Let $U = \{x : x \in N, 1 \le x \le 12\}$ be the universal set and $A = \{1, 9, 10\}$, $B = \{3, 4, 6, 11, 12\}$ and $C = \{2, 5, 6\}$ are subsets of U. Find the sets. **(15)**

a) $(A \cup B) \cap (A \cup C)$

b) $A \cup (B \cap C)$

c) $(A \cup B \cup C)'$

Q.2 a) Define composition of functions. Hence find the composition function: g o f. **(07)**

Given that $A = \{1, 2, 3, 4\}$, $B = \{a, b, c, d\}$, $C = \{x, y, z\}$
Consider the function $f : A \to B$ and $g : B \to C$ defined by
$f = \{(1,a), (2,c), (3,b), (4,a)\}$ and $g = \{(a,x), (b,x), (c,y), (d,y)\}$

b) Let R be a relation on the set A = {1, 2, 3, 4} defined as **(08)**

$R = \{(1,1), (1,2), (1,3), (1,4), (2,2), (2,4), (3,3), (3,4), (4,4)\}$
Construct diagraph for R.

Q.3 a) Construct a combinatorial circuit from the following input / output table. **(07)**

Input		Output
x_1	x_2	$f(x_1, x_2)$
1	1	1
1	0	0
0	1	0
0	0	1

b) Using mathematical induction prove that **(08)**

$$2 + 5 + 8 + \ldots\ldots + (3n-1) = \frac{n(3n+1)}{2}.$$

Q.4 Prove that $A^3 - 4A^2 - 3A + 11I = O$ **(15)**

Where $A = \begin{bmatrix} 1 & 3 & 2 \\ 2 & 0 & -1 \\ 1 & 2 & 3 \end{bmatrix}$ and I is the unit matrix of order 3.

P.T.O.

Q.5 **a)** Express E in its complete sum – of – products of form

i) $E = \left(x' + y\right)' + x'\ y$

ii) $E = y\left(x + yz\right)'$

b) Construct the truth tables for

i) $(p \wedge q) \vee (q \wedge r) \vee (r \wedge p)$

ii) $(p \vee q) \vee r$

Q.6 **a)** If A is the set of natural numbers which are less than 10 and B is the se prime numbers which are less than 10. Then show that $A \times B \neq B \times A$

b) If $A = \begin{bmatrix} 2 & -1 & 0 \\ 0 & -2 & 1 \\ 1 & 0 & 1 \end{bmatrix}$, $B = \begin{bmatrix} -2 & 1 & -1 \\ 1 & 2 & -2 \\ 2 & -1 & -4 \end{bmatrix}$ $C = \begin{bmatrix} 1 & 1 & -1 \\ 2 & -3 & 4 \\ 3 & -2 & 3 \end{bmatrix}$

Evaluate:

i) $2A + 3B - 4C$

ii) $A\left(BC\right)$

Q.7 Write short notes :

a) Types of functions.

b) Basic logical operations.

c) Difference between relations and functions.

SECTION - II

Q.8 Explain the following concepts with suitable examples.

a) Closure properties.

b) Equivalence relations.

c) Partial ordering relations.

d) n – ary relations.

Q.9 **a)** In a city, three daily news papers A, B and C are published. 42 percent people in that city read A, 56 percent read B, 60 percent read C, 24 p read A and B, 34 percent read B and C, 32 percent read C and A, 8 per not read any of three news papers. Using the algebra of sets, fi percentage of persons who read all the three news papers.

b) Find the gcd of

i) 77, 128

ii) 258, 60

using Euclidean algorithm.

Q.10 **a)** Draw circuit diagrams to represent the following equations.

i) $A = (p.\ q).r$

ii) $C = (p.\ q) + \left(\overline{p}\ .\overline{q}\right)$

b) Verify if the propositions:

i) $(p \wedge q) \wedge \sim (p \vee q)$ is a contradiction.

ii) $(p \wedge \sim q) \vee \sim (p \wedge \sim q)$ is a tautology.

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