

Anjuman-I-Islam's
AKBAR PEERBHOY COLLEGE OF COMMERCE AND ECONOMICS

PROFESSIONAL SECTION

Time Table - F. Y. B. Sc. (I.T.) Semester-I (Regular) Dec-2023

| Sr. No. | Date | Day | Name of the Subjects | Time | Duration |
|---------|------------|-------------|---|----------------------|----------|
| 1 | 11-12-2023 | Monday ✓ | Programming Principles with C (V) | 02:30 pm to 05:00 pm | 2 ½ Hrs |
| 2 | 12-12-2023 | Tuesday ✓ | Digital Logic & Applications (V) | 02:30 pm to 05:00 pm | 2 ½ Hrs |
| 3 | 13-12-2023 | Wednesday ✓ | Fundamentals of DBMS (V) | 02:30 pm to 05:00 pm | 2 ½ Hrs |
| 4 | 14-12-2023 | Thursday ✓ | Technical Communication Skills (V) | 02:30 pm to 05:00 pm | 2 ½ Hrs |
| 5 | 15-12-2023 | Friday ✓ | Computational Logic & Disc. Structure (V) | 02:30 pm to 05:00 pm | 2 ½ Hrs |



Akbar Peerbhoy College of Commerce & Eco.

F. Y. B. Sc. IT SEM I CBGS 75 Marks Subject: Digital Logic and Appl.

Date: 12-12-2023 Duration: 02 ½ Hours Roll Number: _____

Note: All questions are compulsory.

1. Attempt any three of the following: 15
 - a. Explain AND and OR Gate with truth table.
 - b. Convert following decimal number into binary number a) 11.34 b) 295
 - c. Convert $(10F.2F)_{16}$ to its equivalent decimal number.
 - d. What is meant by universal gate? Draw logic circuits showing construction of Ex-OR gate using NAND gate and using NOR gate.
 - e. What is an ASCII? Illustrate with example.
 - f. Write a short note on EX-OR Gate.

2. Attempt any three of the following: 15
 - a. State and explain De Morgan's theorem.
 - b. Prove that: $A + \overline{AB} = A + B$
 - c. Simplify using K-map and realize it using minimum number of gates. $F(A,B,C,D) = \sum m(4,6,8,9,10,12,13,14) + d(0,2,5)$
 - d. $F(A,B,C,D) = \sum m(0,1,2,5,13,15)$. Draw k-map and find minimize Boolean expression.
 - e. State the different Boolean theorems.
 - f. Apply suitable Boolean laws and theorems to modify the expression for a two-input EX-OR gate in such a way as to implement a two-input EX-OR gate by using the minimum number of two-input NAND gates only

3. Attempt any three of the following: 15
 - a. Write a short notes on demultiplexer.
 - b. What is multiplexer? Implement the following expression using a multiplexer $F(A,B,C,D) = \sum m(0,4,5,8,9,10,15)$
 - c. Write a short notes on combination logic design.
 - d. Explain a half adder and draw the logic circuit for the same.
 - e. Describe the working of 2 bit half subtractor.
 - f. Write a short notes on octal to binary encoder.

4. Attempt any three of the following: 15
 - a. What is flip-flop? Explain SR flip-flop.
 - b. Draw logic circuit diagram of D flip flop and describe its working using truth table.
 - c. Explain the operation of the shift registers.
 - d. Design modulo 6 ripple counter.
 - e. Discuss various applications of flip-flops.
 - f. Explain working of SIPO register.

5. Attempt any three of the following: 15
 - a. Draw pin diagram of DIP 74181 (LSI) chip.
 - b. List various logical operations corresponding to different combinations of S3, S2, S1 and S0 in DIP 74181 (LSI) chip.
 - c. Narrate each step of Booth's Multiplication algorithm.
 - d. Draw a block diagram of "Carry Look Ahead Block".
 - e. Draw a circuit diagram of Hardware circuit for dividing a 4-bit dividend.
 - f. Explain Binary Division algorithm with example.



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F.Y.B.Sc. IT SEM- I CBGS

75 Marks Duration:02½Hours

Programing Principles with C

Date: ___ 2023

Note: All questions are compulsory.

| | | |
|-------------|--|-----------|
| Q.1: | Attempt any three. | 15 |
| a) | Briefly explain the history of C language. | |
| b) | Explain symbols used in Flowchart using suitable example. | |
| c) | Write an algorithm for any one of the following i) Tea Vending Machine ii) Making Call using Mobile Phone | |
| d) | Draw a flow chart for any one of the following i) Tea Vending Machine ii) Making Call using Mobile Phone | |
| e) | Define the following: i) Keywords ii) Variable iii) Constant iv) identifier v) Algorithm | |
| f) | Write and explain the structure of C program using a program to print "Hello World!". | |
| Q.2: | Attempt any three. | 15 |
| a) | Write a short note on arithmetic operations in C language. | |
| b) | Write a program to demonstrate the use of logical operators in C. | |
| c) | Explain the various shorthand operators in C language. | |
| d) | Write a program using if – else structure to check whether the number is divisible by 7 or not | |
| e) | Explain the working of nested loop using suitable example. | |
| f) | Write a short note on Break, Go to and Continue. | |
| Q.3: | Attempt any three. | 15 |
| a) | Define Function. Explain function declaration and call in C. | |
| b) | Write a program using function to check whether a number is prime or not. | |
| c) | List and explain any five Maths functions available in C language. | |
| d) | Write a short note on stdio.h header file in C language. | |
| e) | Explain the use of printf() and scanf() function. Support your answer with an example. | |
| f) | Write a short note on recursion. | |
| Q.4: | Attempt any three. | 15 |
| a) | Define Pointers. Demonstrate the declaration and call of pointer using suitable example. | |
| b) | What is Pointer arithmetic? Explain. | |
| c) | Write a program using pointers to swap the value of variables in memory | |
| d) | Write a program using array to sum of five numbers. | |
| e) | Write a short note on pointer to function. | |
| f) | Declare a matrix of five rows and five columns. Display it on Screen. | |
| Q.5: | Attempt any three. | 15 |
| a) | Write a short note on structures. | |
| b) | Declare a structure to store book information. Display the book info on screen. | |
| c) | Explain the following concepts: i) Array in Structure ii) Array of Structures | |
| d) | What are the various operations performed on a file in C language. | |
| e) | Write a program in C to read the contents of "abc.txt" file on screen. | |
| f) | Write a short note on pointer to a structure using suitable example. | |
| | -x-x-x-x-x- ALL THE BEST -x-x-x-x-x- | |



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F.Y.B.Sc. IT SEM- I CBGS

75 Marks Duration:02½Hours

Fundamentals of Database Management System

Date: ___ 2023

Note: All questions are compulsory.

- Q.1 Attempt any three.** 15
- Explain SELECT statement with suitable example.
 - What is DBMS? Write its advantage and disadvantage.
 - Explain the following term with suitable example
 - Entity
 - Attribute
 - Write and explain the syntax of CREATE TABLE command.
 - Draw and explain the architecture of DBMS.
 - Write INSERT statement to add a record with values (20, 'AMIT', 'DADAR', 98989) in STUD table.
 - Write a SQL statement to display records not having address="MAHIM" from table.
- Q.2 Attempt any three.** 15
- What is relational algebra? Explain PROJECT operation with suitable example.
 - What is DDL statement? Explain different types of DDL statement.
 - What is relational database constraint? Explain NOT NULL constraint with example.
 - What is relational algebra? Explain UNION and INTERSECTION operation with suitable example.
 - What is relational database constraint? Explain PRIMARY KEY constraint with example.
 - Write UPDATE statement to increase salary of all employees by 1200.
 - Write a SQL statement to delete records having address="BANDRA" from table.
- Q.3 Attempt any three.** 15
- What is normalization? Write its benefit.
 - What is functional dependency? Explain Armstrong's axioms of functional dependency.
 - What is update anomaly? Explain with suitable example.
 - Explain multivalve and transitive functional dependency.
 - Write and explain 1NF, 2NF and 3NF.
 - Write INSERT statement to add a record in EMPLOYEE table.
 - Write a SQL statement to display all records from EMPLOYEE table.
- Q.4 Attempt any three.** 15
- What is view? Write and explain the syntax to create view.
 - What is aggregate function? Explain min() and max() function with suitable example.
 - What is an ER diagram? Draw and explain different symbols used to draw ERD.
 - Explain count(), avg() and sum() aggregate functions with example.
 - Write and explain PL/SQL block structure.
 - Write a SQL statement to delete records having prod_qty more than 50.
 - Write a SQL statement to display all records of "A" quality.
- Q.5 Attempt any three.** 15
- What is data model? Write and explain different element used in data model.
 - Write and explain the syntax of INSERT statement with suitable example.
 - Draw the ERD for College Management System.
 - Explain different types of relationships in ER diagram with suitable example.
 - Create a table with primary key having field as (DNO, DNAME, DADDR, DPH).
 - Write a SQL statement to add one more column "SALARY" in existing EMP10 table.

-x-x-x-x-x- ALL THE BEST -x-x-x-x-x-



Akbar Peerbhoy College of Commerce & Eco.

F.Y.B.Sc. IT SEM- I CBGS 75 Marks Technical Communication Skills

Date: _____ 2023 Duration: 02½ Hours

Note: All questions are compulsory.

| | |
|---|-----------|
| 1. Attempt any three of the following: | 15 |
| a. What is Technical Communication: | |
| b. Explain advantages & disadvantages of oral communication | |
| c. Discuss with diagram the main components of communication process | |
| d. Discuss the importance of communication in an organization | |
| e. Which are the main communication barriers | |
| f. How to overcome these barriers of communication | |
| 2. Attempt any three of the following: | 15 |
| a. Discuss 7 C's of effective communication | |
| b. Write a short note on body language | |
| c. Write a short note on effective listening | |
| d. Write a short note on Common Barriers to Listening | |
| e. Write a short note on gestures & Types of gestures | |
| f. How to use gesture effectively | |
| 3. Attempt any three of the following: | 15 |
| a. Discuss the Purpose of Business Presentations | |
| b. Factors for delivering an effective presentation | |
| c. The six steps to becoming an effective presenter | |
| d. What is Visual Aids? | |
| e. Discuss different types of visual aids | |
| f. Explain 10 Cs of technical Writing | |
| 4. Attempt any three of the following: | 15 |
| a. Key aspects related to corporate meetings | |
| b. How to conduct a business meeting effectively | |
| c. Explain effective Report Writing | |
| d. What is Conference? Explain its various Characteristics | |
| e. What is Convention? Explain its various Characteristics | |
| f. Write a short note Planning an effective presentation | |
| 5. Attempt any three of the following: | 15 |
| a. Which are key types of interviews in business communication | |
| b. Explain the Interview process | |
| c. Discuss key components and features of teleconferencing | |
| d. What are the key elements and components of a typical business letter | |
| e. As an Entrepreneur write a business letter to the local restaurant owner offering the basic services in IT, which will increase their business | |
| f. Explain the Structure of a business presentation | |
| -x-x-x-x- ALL THE BEST -x-x-x-x- | |

Instructions: All questions are compulsory.

Q1 Attempt any three

- (a) Explain with an example: 1) Reflexive relation 2) Transitive relation. [15]
5
(b) Define set and explain 4 operation on set with an example. 5
(c) Let z be the set of integers. Let R be the relation defined on set z such that $xRy \Leftrightarrow 3x+5y$ is divisible by 8. Show that R is symmetric. 5
(d) Use mathematical induction to prove that $1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$ 5
(e) $A = \{2,3,5\}$, $B = \{2,4,6,10\}$ Check if R is a relation. 5
From set A to set B , Given $2R2$, $2R4$, $2R6$, $2R10$, $3R6$, $5R10$.
(f) Let $U = \{x | x \in z, 0 \leq x \leq 10\}$ be a universal set and $P = \{x | x \text{ is a prime number}\}$,
 $Q = \{x | x^2 < 70\}$ are the subsets of U . 5
1. Draw a venn diagram for the above
2. List the elements in $P^c \cap Q$.

Q2 Attempt any three

- (a) Let $V = \{1,2,3,4\}$. For the following functions $f:V \rightarrow V$ and $g:V \rightarrow V$. Find [15]
5
1. $f \circ g$
2. $g \circ f$
 $f = \{(1,3), (2,1), (3,4), (4,3)\}$
 $g = \{(1,2), (2,3), (3,1), (4,1)\}$
(b) In multiple choice question (MCQ) there are 4 choices out of that only one choice is the correct answer. The examinee answer such type of questions by three ways. 5
i. Guess
ii. Copy
iii. Know the answer.

The probability that the answer is given by guess is $\frac{1}{3}$, by copy is $\frac{1}{6}$. The probability that his answer is correct, given that he copies it, is $\frac{1}{8}$. Find the probability that he knew the answer to the question, given that he correctly answer it.

- (c) A box contains 8 red, 9 blue and 15 white balls. One ball is drawn at random from this box. Find the probability that 5
1. It is red or blue
2. Neither blue nor white
3. Not red.
(d) Find Ackermann function $A(1,3)$. 5
(e) Three coins are tossed. a person receives Rs. X^2 if he gets X heads. Find the probability distribution and expected value. 5
(f) Define one to one function. 5
Let $X = \{1,2,3\}$ and $Y = \{a,b,c,d\}$
Define $H: X \rightarrow Y$ as $H(1)=c$, $H(2)=a$, $H(3)=d$
Define $K: X \rightarrow Y$ as $K(1)=d$, $K(2)=b$, $K(3)=d$.
Is either H or k one to one Justify.

Q3 Attempt any three

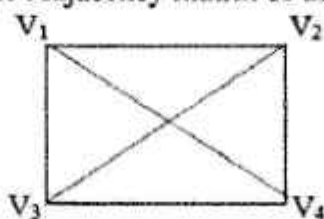
[15]

- (a) If repetition of digits is permitted. 5
 1. How many three digits numbers can be formed from the 6 digits 2,3,4,5,7 & 9?
 2. How many of these numbers are less than 400?
- (b) Find $f(2)$, $f(3)$, $f(4)$ if f is defined recursively by $f(0)=-1$, $f(1)=2$ and for $n=1,2,3,\dots f(n+1) = f(n)+3f(n-1)$. 5
- (c) A box contains 7 red, 6 white and 4 blue balls. Find, how many selection of three balls can be made so that 5
 - 1.) None is red.
 - 2.) One is of each colour.
- (d) Explain the Tower of Hanoi. 5
- (e) How many four digits numbers can be formed out of digits 1,2,3,5,7,8,9 if no digit is repeated in any numbers? 5
- (f) Show that if 7 numbers from 1 to 12 are selected then at least two of them will add up to 13. 5

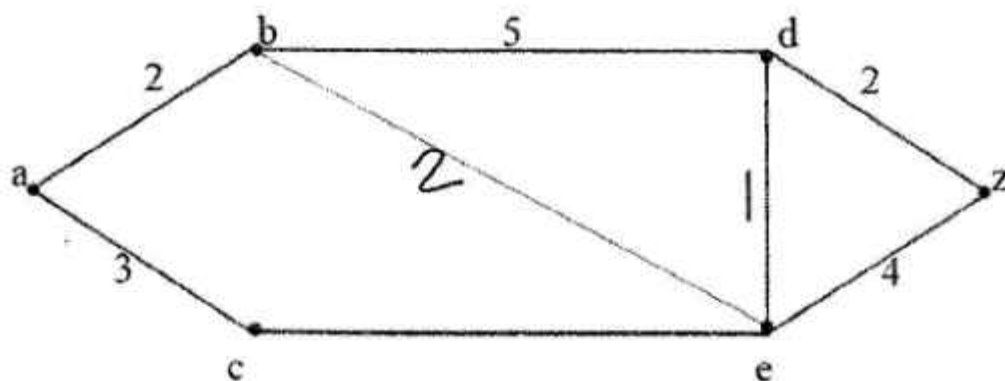
Q4 Attempt any three

[15]

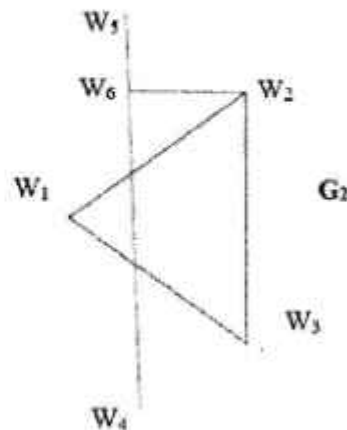
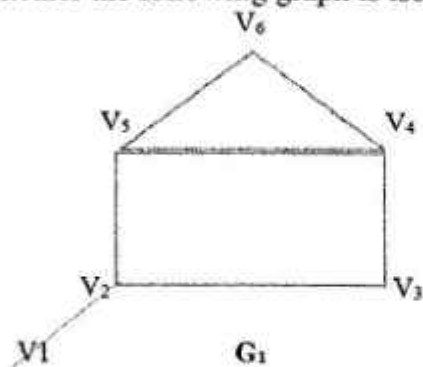
- (a) Explain graph with 2 examples. 5
- (b) Write 5 types of graphs with examples. 5
- (c) Define cycle. what is complete graph? What is the number of edges in a complete graph? 5
- (d) What is Adjacency matrix. Write the Adjacency matrix of the following. 5



- (e) Find the shortest path from a to z by dijkstra's algorithm. 5



- (f) Check whether the following graph is isomorphic. 5



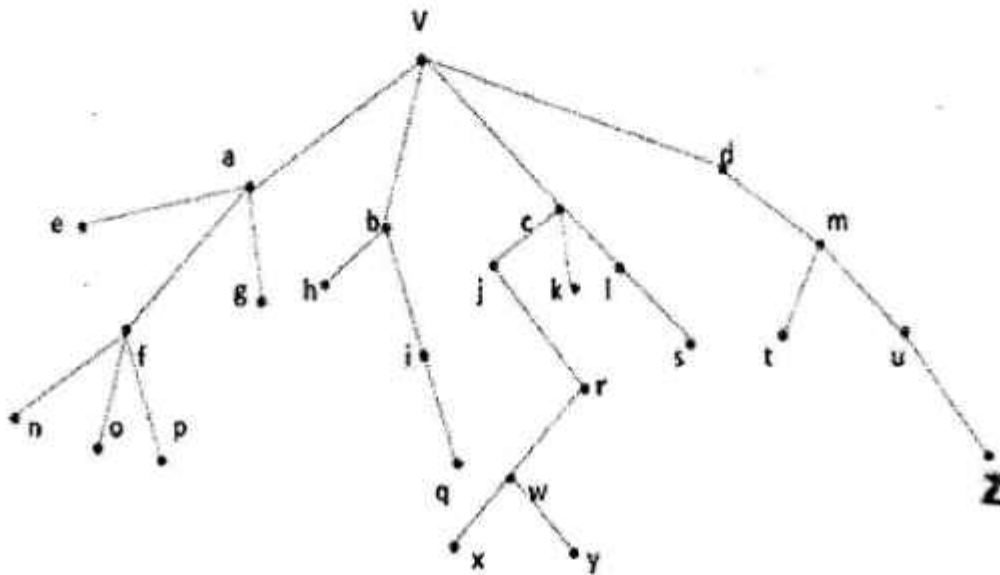
Q5 Attempt any three

[15]

- (a) Explain Lattices. What is join and meet? 5
- (b) For a given list of symbols and frequencies .construct a Huffman code tree and write the code of each symbol . also encode the words DEFEATED and CABBAGE. 5

| LETTERS | A | B | C | D | E | F | G | H |
|-------------|------|------|------|------|------|------|------|------|
| FREQUENCIES | 0.06 | 0.12 | 0.20 | 0.13 | 0.10 | 0.15 | 0.17 | 0.05 |

- (c) Draw Hasse diagram of Poset (S_{24}, D) . 5
- (d) Observe the given tree and answer the following question: 5
 1. Root of the tree
 2. Internal vertices of the tree
 3. Siblings of o
 4. Leaves of a tree
 5. Subtree rooted at a



- (e) Explain partially ordered set with an example. 5
 - (f) Explain Traversing Binary tree. 5
- Determine the preorder, inorder and post order traversing of the given binary tree.

