



ANJUMAN-ISLAM'S

AIKTC KALSEKAR TECHNICAL CAMPUS
INNOVATIVE TEACHING EXUBERANT LEARNING

School of Architecture

School of Engineering & Technology

School of Pharmacy

Knowledge Resource & Relay Centre (KRRC)

AIKTC/KRRC/SoET/ACKN/QUES/2022-23/

Date: 25/01/23

School: SoET-CBCS-Rev.

Branch: BSC.IT

SEM: I

To,
Exam Controller,
AIKTC, New Panvel.

Dear Sir/Madam,

Received with thanks the following [✓]Semester/[✓]Unit Test-I/Unit Test-II (Reg./ATKT) question papers from your exam cell:

Sr. No.	Subject Name	Subject Code	Format		No. of Copies
			SC	HC	
1	Programming Principles with C	USIT101		✓	
2	Digital Logic and Applications	USIT102		✓	
3	Fundamentals of Database Management Systems	USIT103		✓	
4	Computational Logic and Discrete Structure	USIT104		✓	

Note: SC – Softcopy, HC - Hardcopy

(Shaheen Ansari)
Librarian, AIKTC

F.Y.B.SC.IT -I SEMESTER EXAMINATION 2022-23

SUBJECT : PROGRAMMING PRINCIPLES WITH C

MAX. MARKS : 75

DATE : 26/11/2022

DURATION : : 2 ½ Hrs

- N. B.: (1) All questions are compulsory.
(2) Make suitable assumptions wherever necessary and state the assumptions made.
(3) Answers to the same question must be written together.
(4) Numbers to the right indicate marks.
(5) Draw neat labeled diagrams wherever necessary.
(6) Use of Non-programmable calculator is allowed.

- 1. Attempt any three of the following:** 15
- What is an Algorithm? Explain.
 - What is the role of a compiler in programming?
 - What is Data Type? Explain various types of it.
 - List and explain five desirable program characteristics.
 - Explain keywords and identifier in C
 - What is constants? Explain its types.
- 2. Attempt any three of the following:** 15
- Explain the conditional operator in C with example.
 - Explain assignment operators in C with example.
 - Explain while and do-while with difference.
 - What is Relational operator? Explain with an example?
 - Write a program to find the given string is palindrome or not.
 - Explain Switch case with example.
- 3. Attempt any three of the following:** 15
- What is function ? Explain advantages of function.
 - Explain user defined and library function.
 - Explain with example call by value in function.
 - Explain call by reference in C.
 - Explain function with no arguments with no return type in C.
 - Write a program using strlen(), strcmp() function.
- 4. Attempt any three of the following:** 15
- What is an Array? Explain its types.
 - Write a short note on Pointer
 - Write a program to accept '5' integers from user into an array and display them one in each line.
 - What is a Function Pointer ? Explain with an example.
 - WAP to make multiplication of two dimensional array in C.
 - What is Dynamic Memory Allocation? Explain its functions.
- 5. Attempt any three of the following:** 15
- What is structure ? Create an Employee structure with two members that are ID and Name. Input and display record of two employees .
 - Write different ways of initializing structure.
 - Explain the difference between structure and union in C
 - Write difference between in union and structure
 - Write a program to perform addition and subtraction using a pointer.
 - Write difference between array and structure.

F.Y.B.SC.IT - I SEMESTER EXAMINATION 2022-23

SUBJECT : DIGITAL LOGIC AND APPLICATIONS

MAX. MARKS : 75

DATE : 30/11/2022

DURATION : 2 ½ Hrs.

N. B.: (1) All questions are compulsory.

(2) Make suitable assumptions wherever necessary and state the assumptions made.

(3) Answers to the same question must be written together.

(4) Numbers to the right indicate marks.

(5) Draw neat labelled diagrams wherever necessary.

(6) Use of Non-programmable calculators is allowed.

1. Attempt any three of the following:

[15]

- Convert the following. (i) $(928)_{10} = (?)_8$ (ii) $(101011)_2 = (?)_{10}$ (iii) $(362)_{10} = (?)_2$
- What is XS-3 code? Explain with example
- Perform the following. (i) $(97)_{10} = (?)_2$ (ii) $(f3C)_{16} = (?)_8$ (iii) $(10110101)_2 = (?)_{10}$
- Explain Positional Number System in detail.
- Explain with example 1's complement method used for addition.
- Explain Basic gates with a truth table.

2. Attempt any three of the following:

[15]

- Explain K map reduction technique.
- Explain Quine McCluskey Method.
- Explain Minterm and Maxterm.
- Simplify Boolean function $F(a,b,c,d) = \sum m(0, 1, 2, 3, 5, 6, 7, 10, 13, 14, 15)$ using K-Map.
- Explain NAND and NOR gates in detail.
- Explain Quine Mc-Cluskey minimization technique.

3. Attempt any three of the following:

[15]

- Explain Full adder.
- Explain 4:1 Multiplexer.
- Explain 3 to 8 Decoder.
- Explain Encoder.
- Explain 1:2 Demultiplexer.
- Explain Priority Encoder.

4. Attempt any three of the following:

[15]

- Write a note on flip-flop.
- Explain Master Slave J-K flip-flop.
- State difference between Combinational circuit and Sequential Circuit.
- Explain T flip flop.
- Explain synchronous counter.
- Explain the term Synchronous and Asynchronous.

5. Attempt any three of the following:

[15]

- Design 1:4 demultiplexer
- Draw flow chart of division (restoring) algorithm.
- Draw flow chart for binary multiplication algorithm.
- Design 8: 1 multiplexer with truth table.
- Explain the look ahead carry generator.
- Explain Booth's algorithm with an example.

F.Y.B.SC.IT -I SEMESTER EXAMINATION 2022-23

SUBJECT : FUNDAMENTAL OF DATABASE MANAGEMENT SYSTEM

MAX. MARKS : 75

DATE :28/11/2022

DURATION : 2 ½ Hrs.

N. B.: (1) All questions are compulsory.

(2) Make suitable assumptions wherever necessary and state the assumptions made.

(3) Answers to the same question must be written together.

(4) Numbers to the right indicate marks.

(5) Draw neat labelled diagrams wherever necessary.

(6) Use of Non-programmable calculators is allowed.

1. Attempt any three of the following: 15
- a. Define database. What are the Advantages and Disadvantages of DBMS?
 - b. Differences between DBMS and File processing system?
 - c. Explain three-schema architecture?
 - d. What are the basic building blocks of data model. Explain with example?
 - e. Short note on (i) Domain integrity (ii) Entity integrity.
 - f. Explain the Entity Relationship Model?
2. Attempt any three of the following: 15
- a. What is mapping cardinality and its types?
 - b. List and explain different types of attributes in ER model.
 - c. Draw an ER diagram for a university consisting of following entities and convert it into tables.
1) student (2) Department (3) Class (4) Faculty.
 - d. Explain relation algebra? Select Operation. Project Operation.
 - e. List and Explain the symbols in the use case diagram with proper example?
 - f. What is UML .Types of UML?
3. Attempt any three of the following: 15
- a. Write a short note Functional dependencies?
 - b. What is Normalization .Explain 1NF?
 - c. Explain Decomposition ?
 - d. Types of functional dependencies? Explain Transitive dependencies.
 - e. Define Third normal form(3NF) and its advantages ?
 - f. what is Normalization. Explain different anomalies ?

4. Attempt any three of the following:

a Solve the following query.using following table?(table worker)

WORKER ID	FIRST NAME	LAST NAME	SALARY	JOINING DATE	DEPARTMENT
001	Monika	Arora	100000	2014-02-20 09:00:00	HR
002	Niharika	Verma	80000	2014-06-11 08:00:00	Admin
003	Vishal	Singhal	300000	2014-02-20 09:00:00	HR
004	Amitabh	Singh	500000	2014-02-20 09:00:00	Admin
005	Vivek	Bhat	500000	2014-06-11 09:00:00	Admin
006	Vijay	Diwan	200000	2014-06-11 09:00:00	Account
007	Satish	Kumar	75000	2014-01-20 09:00:00	Account
008	Geetika	Chauhan	90000	2014-04-11 09:00:00	Admin

(i) Write an SQL query to print details of Workers with DEPARTMENT name as "Admin".

(ii) Write an SQL query to print details of the Workers whose FIRST_NAME contains 'a'.

(iii) Write an SQL query to print details of the Workers whose FIRST_NAME ends with 'a'.

(iv) Write an SQL query to print details of the Workers whose SALARY lies between 100000 and 500000.

(v) Write an SQL query to fetch the count of employees working in the department 'Admin'.

b Explain Arithmetic operators and comparison operators?

c Different types aggregate functions in SQL?

d Explain query Processing in DBMS?

e Write a short note on DDL and DML?

f What is view and advantage of views?

5. Attempt any three of the following:

a. Explain Transaction management Architecture?

b. Types of database recovery techniques? Log-based, shadow paging, checkpoints?

c. What is Process recovery. advantages and disadvantages?

d. Explain Database recover ?

e. Explain Transaction states?

f. Different types Transaction log?

- N. B.: (1) All questions are compulsory.
(2) Answers to the same question must be written together.
(3) Numbers to the right indicate marks.
(4) Draw neat labeled diagrams wherever necessary.
(5) Use of Non-programmable calculator is allowed.

1. Attempt any three of the following:

15

- Definition of Set, Different types of sets with examples.
- Find the dual of the given statement and prove its dual. $(A \cup U) \cap (B \cup \phi) = B$
- Explain Set Operations with Proper Venn diagram.
- Consider Relation $R: A \rightarrow B$ where $A = \{-1, 1, 0, 2\}$ and $B = \{0, 1, 2, 3, 4\}$. Draw a Relation that satisfies $R = \{(a, b) : a \in A, b \in B, a^2 = b\}$, Write All Images and Pre-images and Domain(DR), Range(RR), Co-Domain(Co-DR) Derived From Relation.
- (i) For a given set $A = \{a, b, c\}$ Find $n(P(P(P(A)))) = ?$.
(ii) Write the dual of each equation: $E \rightarrow E^*$
(a) $A \cup \phi = A$ (ii) $A \cup A' = U$ (b) $(A \cap B) \cup (A' \cap B) \cup (A \cap B') \cup (A' \cap B') = U$
(iii) If X and Y are Two Sets Then $X \cap (Y \cup X)$ is a) Y b) X c) ϕ d) None of the above
(iv) Let A and B are two sets, If $A \cap B = \phi$, Then A and B are _____ sets.
- Let U be an universal set and A, B, C are subsets of U. Then for all A, B, C prove the following
(i) $A \cup B \subseteq U$ (ii) $A \cup B = B \cup A$ (iii) $A \subseteq A \cup B, B \subseteq A \cup B$ (iv) $A \cup \phi = A$ (v) $A \cup A' = U$.

2. Attempt any three of the following:

15

- Prove that: probability of an impossible event ϕ is an zero.
- Let $f: R \rightarrow R$ be defined by the rule $f(x) = x^2$ show that f is bijective.
- Explain Function, Types of Function, And Invertible Function With Examples.
- What are Mathematical Functions? Explain Any Two with their Domain & Range.
- Define $f: R \rightarrow R$ by the rule $f(x) = 4x - 1$ for all $x \in R$, Is f is one-to-one? Give a counter example.
- A leap Year is selected at random, what would be Sample space & Probability of having 53 Mondays.

3. Attempt any three of the following:

15

- In a survey of 120 people, it was found that:
65 read *Newsweek* magazine, 20 read both *Newsweek* and *Time*, 45 read *Time*, 25 read both *Newsweek* and *Fortune*, 42 read *Fortune*, 15 read both *Time* and *Fortune*, 8 read all three magazines.
(a) Find the number of people who read at least one of the three magazines.
(b) Fill in the correct number of people in each of the eight regions of the Venn diagram
(c) Find the number of people who read exactly one magazine.
- Let U be the set of positive integers not exceeding 1000. Then $|U| = 1000$. Find $|S|$ where S is the set of such integers which are not divisible by 3, 5, or 7.
- State and prove first pigeonhole principle.
- By using Pigeonhole principle, Find the minimum number of students in the class to be sure that three of them are born in the same month.
- How many ways are there to select a first-prize winner, a second prize winner and a third prize winner from 100 different people who have entered a contest?
- How many 4-letters words with or without meaning, can be formed out of the letters of the word ALGORITHMS, if repetition of letters is not allowed?

4. Attempt any three of the following:

15

- Explain connected and disconnected graph with suitable example.
- Explain Traversable path with suitable example.
- Explain the terms (i) Complete Graph (ii) Regular Graph.
- Explain Directed cycle free graph with suitable example.
- Define: (i) Directed graph (ii) undirected graph
- Explain: (i) Eulerian cycle (ii) Eulerian path.

5. Attempt any three of the following:

15

- Explain cycle with their properties.
- Define the terms (i) Maximal Element (ii) Minimal Element.
- Write any 3 difference between General Tree and binary Tree.
- Explain Ordered set and Partially Ordered sets with example.
- Write any 3 properties of trees.
- Explain the term (i) Well-ordered sets (ii) Lattice.