Max Time: 2½ hrs | **FYBSc IT** | Max Marks: 75

PPC – Sem-I

02/11/2023

instructions:

1) **All** questions are **compulsory**.
2) Mixing of sub questions are not allowed.
3) Write in clear, legible, writings.

Q I) Attempt any **three: -** (15)

A) Write a program to sort the array in ascending order.
B) Write a program to display Fibonacci series
C) Create the structure of an employee consisting of his name, employee id, salary.
D) Write a short note on pointers. Explain the different operators used in pointers.
E) Write a brief note on dynamic memory allocation.
F) Write a program to swap two numbers with the help of pointers.

Q I I) Attempt any **three: -** (15)

A) Explain the term typecasting and typedef.
B) What do you mean by linkers and preprocessors. Write a brief note on it.
C) Explain the constant and its type in brief.
D) What are the different operators used in C Programming.
E) Differentiate between while loop and do-while loop.
F) State the difference between break and continue statements with the help of a program.

Q III) Attempt any **three: -** (15)

A) What are the basic datatypes supported in C Programming Language.
B) What are identifiers. Enlist some of the identifiers and explain in brief.
C) Write a short note on keywords. Describe some of the keywords briefly.
D) Write a program on nested Else If statements.
E) Write a program to demonstrate the Floyd triangle.
F) Explain some of the library functions in brief.

Q IV) Attempt any **three: -** (15)

A) What is functions. Explain the different types of it.
B) Write a program to find the sum of natural number using recursion.
C) Write a program in C to find the armstrong numbers.
D) Write a program to Open a File, write in it, And Close the File.
E) What do you mean by array. Explain the different types of it.
F) Explain some of the string handling functions with the help of examples.

Q V Attempt any **three: -** (15)

A) Write a program to find the reverse of a given number.
B) Explain the switch case statement with the help of a program.
C) Write a short note on Bit fields.
D) Differentiate between structure and union.
E) Write a program to access elements of an array using pointers.
F) Explain the difference between call by value and call by reference with the help of programs.

Max Time: 2½ hrs | FYIT Semester I | Max Marks: 75

Digital logic and applicationt 03/11/2023

Instructions:

1) **All** questions are **compulsory**.
2) Mixing of sub questions is not allowed.
3) Write in clear, legible, writing.

Q1) Attempt any three. (15)

A) What is meant by the universal logic gate? Draw logic circuit showing EX-OR gate using NAND gate and NOR gate.

B) Convert the following fractional decimal numbers to equivalent binary numbers (show the step by step).
   a. 0.5682
   b. 0.6954
   c. 0.1235

C) State the difference between analog and digital signals with examples.

D) Multiply hexadecimal numbers (72)16 and (39)16.

E) Perform the following binary operation using the 2'complement method.
   a. (1010)2 - (101)2
   b. (1001)2 - (1101)2

F) Convert following binary numbers into decimal equivalent form.
   a. 1011.01.10101
   b. 1001.0101
   c. 1100.1011

Q2) Attempt any three: (15)

A) Prove the given Boolean expression using Boolean laws and draw the circuit for it using NAND gates only
A.B+A'B+A'B'=A'+B

B) Solve: Y= A'.B'.C'.D'+A'.B'.C'.D+ A'.B.'C.D+ A'.B.C'.D+A'.B.C.D+A'.B.C.D+A.B'.C'.D+A.B'.C.D' A.B.C'.D by using K map and write the minimize equation.

C) F (A,B,C,D)=∑m(0,1,2,5,6,7,12,13,15). Draw k-map and find minimized Boolean expressions.

D) Explain postulates of boolean algebra.

E) Realize the given Boolean expression using NOR gates only.
Y=(A'+B+C) .(A+B'+C') .(A'+B'+C') . (A'+B+C') .

F) Explain principles of duality and D- Morgan theorems for boolean algebra.

Q3) Attempt any three: (15)

A) Design a full adder using 8:1 multiplexer..

B) Draw and explain 4 bit binary to gray code converter.

C) Draw and explain 3:8 line decoder with a truth table and circuit.

D) Draw and explain BCD to EXCESS-3 adder with truth table and k-map.

E) Explain the design procedure of combinational circuits with examples..

F) Design 4 bit magnitude comparator using logic gates.

Q4) Attempt any three: (15)

A) What is a sequential circuit? Explain applications of asynchronous sequential circuits.

B) Design and explain JK flip flop.
C) Explain PIPO and SISO shift register with diagram.
D) Design and explain 5 stage twisted ring counter.
E) Explain synchronous counter design procedure in detail.
F) Design 4 bit binary UP/DOWN ripple counter with a control of UP/DOWN counting..

Q5) Attempt any three: (15)

A) Draw and explain ALU block diagram in detail.
B) Perform the following multiplication in binary number system: (15)10 x (8)10
C) Perform the following binary division
   a)divide 110 by 10
   b) divide 1110101 by 1001
D) Draw and explain 4 bit parallel adder.
E) Using booth's multiplication algorithm multiply (6) and (12) .
F) Write the steps for octal division and perform following octal operations:
   a) perform (24)8 ÷ (4)8.
   b) Perform (12) 8 x (7)8

Class:-F.Y.B.Sc.I.T.

Subject:- Database Management Systems 04/11/2023

(Time:- 2 hours 30 minutes)

Total Marks :- 75

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 calculators is allowed

Q. 1.] Attempt any three of the following :- **15**

1. What are the different types of database system users?
2. What is Data Abstraction? Explain its three levels
3. What do you mean by Data Model? What are its different categories? Explain each
4. What do you mean by Data Independence in DBMS? Explain Logical Data Independence and Physical Data Independence
5. What are the different types of database system users?
6. What is Relational Algebra? Explain the following operators used in relational algebra: a. Select b. Project. c. Rename d. Set. e. Cartesian product. f. Joins

Q. 2.] Attempt any three of the following:- **15**

1. What are the different types of keys that can occur in a table? Explain any five
2. Draw the ER diagram of a Library management system
3. Explain ER diagrams and its components
4. Explain the different types of attributes:- simple, composite, multi-valued, derived, key attribute
5. Explain the different cardinalities of relationships
6. Explain the different types of entities

Q. 3.] Attempt any three of the following:- **15**

1. Explain what is generalization and specialization in ER diagrams
2. What are the types of functional dependencies? Explain each
3. Explain the different anomalies that can occur if the tables are not normalized
4. Explain the difference between lossy and lossless decomposition
5. Explain the process of normalization through an example
6. What are constraints in a DBMS? What are the different types of constraints? Explain.

Q. 4.] Attempt any three of the following:- 15

1. What are the different components of SQL? Explain
2. Give the syntax of:- creating a table, inserting data in , dropping a table, Select Statement
3. What is a subquery? What are the rules for a subquery? Explain how subqueries are used in the following predicates:- ANY, ALL
4. Define Joins in database. Explain the following types of joins in detail:- Cross, Inner, Equi, Natural, Self
5. List and explain the different types of Aggregate functions
6. Consider the following tables:-
   BOOKS(BookId, Title, Price)
   SUPPLIER(SupId, SupName, SupAddress)
   BOOKSUPPLY(BookId, SupId, Quantity)
   Write SQL queries to do the following:- (any five)
   i. Display the details of books whose prices are greater than the average price of books
   ii. Display names of all suppliers who are supplying book with BookId 'B005'
   iii. Display the highest quantity of books supplied by each supplier
   iv. Display the names of books starting with 'B' and ending with 'G'
   v. Display the title of the costliest book
   vi. Display the book titles and names of their suppliers

Q. 5.] Attempt any three of the following:- 15

1. What is a transaction? What are the different states of a transaction? Explain with a diagram
2. List the ACID properties of a transaction. Explain each with an example
3. Why is there a need for Concurrency Control?
4. What is a DBMS lock? What are the two modes in which a data item can be locked?
5. What are the levels of locking a data item? Explain two-phase locking protocol
6. What are the different deadlock detection and recovery schemes?

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Max Time: 2½ hrs | FYIT Semester I | Max Marks: 75

Technical Communication Skills 07/11/23

Instructions:

1) **All** questions are **compulsory.**
2) Mixing of sub questions is not allowed.
3) Write in clear, legible, writing.

Q1) Attempt **any three:** **(15)**

A) What is the process of communication?
B) Explain the stages in developing relationships through interpersonal communication?
C) What is Barriers Communication? Explain the classification of Barriers?
D) Explain the Levels of communication?
E) Explain various forms of nonverbal communication?
F) What is nonverbal communication?

Q2) Attempt **any three:** **(15)**

A) What is email etiquette? write down a few points which one should consider while writing an email?
B) What are the different types of audience? explain the steps involved in audience analysis?
C) Write the 7 cs of effective communication?
D) Explain the five main stages of writing business messages?
E) What is financial communication and what are its constituents?
F) What is meeting and conferencing explaining different types of conferencing?

Q3) Attempt **any three:** **(15)**

A) State and explain the activities involved in branding a project?
B) Explain effective presentation strategy?
C) Explain the different types of interviews?
D) Explain Active and Passive listeners?
E) What are the preparations that one must do before appearing in an interview?
F) What is an active listener ? explain the type of listener?

Q4) Attempt **any three:** **(15)**

A) Write the steps of business letter writing ?
B) Write the step for writing a body of a letter?
C) What is a resume? its format ?traditional electronics and video resume?
D) State and explain the steps in writing business reports ?
E) Explain the difference between a traditional resume and video resume?
F) Explain five main strategies for writing business messages?

Q5) Attempt **any three:** **(15)**

A) What is MIS? explain the objectives of MIS?
B) Write down the tips to use the elements of financial communication?
C) How does Visual Aids play an important role in presentation?
D) How will you present your wish to communicate in an effective way?
E) What are the ethical dilemmas faced by managers in business communication?
F) Explain the key principles of ethical communication?

Max Time: 2½ hrs | FYIT Semester I | Max Marks: 75

CLDS

08/11/23

Instructions:

1) **All** questions are **compulsory**.
2) **Mixing of sub questions is not allowed.**
3) Write in clear, legible, writing.

Q1) Attempt any three: (15)

A) Write the definition of Reflexive , symmetric ,Transitive and equivalence Relation.
R is relation defined on a set of Coplanar lines show that "R" is an equivalence relation if xRy implies line x is parallel to Line y.

B) Let = {1,2,3,4} , R be arealtion on the set A defined by
$R = \{(1,1), (1,2), (1,3), (1,4), (2,2), (2,4), (3,3), (3,4), (4,4)\}$ Construct the matrix and digraph of R.

C) If $A = \{1,2,3\}$, $B = \{2,3,4\}$, $S = \{1,3,4\}$ and $T = \{2,4,5\}$, verify that:

$$(A \times B) \cap (S \times T) = (A \cap S) \times (B \cap T).$$

D) use mathematical induction to prove that
$1^2 + 2^2 + 3^2 + \ldots + n^2 = \frac{n(n+1)(2n+1)}{6}$ for all integers $n \geq 1$

E) Let A={1,2,3,4,6} ,Let R be a relation defined on set A such that xRy iff "x complete divides y". write R , draw the digraph and write the matrix for R.

F) In a college, 100 student have access to three software packages, A,B and C 28 did not use any software . 8 used only packages A, 26 used packages B , 7 used only packages C , 10 used all 3 packages and 3 used both A and B.

i) Draw a Venn diagram with all sets enumerated as for as possible. Label the two subsets which cannot be enumerated as x and y.

ii) If twice as many students used package B as packages A , write down a pair of simultaneous equation in x and y.

iii)solve these equation to find x and y. How many used package C?

Q2) Attempt any three: (15)

A) Let $f: R \to R$ be defined by the rule $f(x) = x^3 + 5$. Show that f is one to one and onto. Find the inverse function

B) For the following probability distribution :

Obtain (i) $P(X > 3)$ $(ii) P(X \leq 4)$ $(iii) P(X$ is a multiple of 3) (iv) $P(X$ is odd)

$(v) E(x)$ $(vi) V(X)$

X	0	1	2	3	4	5	6
$P(X)$	0.02	0.06	0.10	0.14	0.18	0.22	0.28

C) In a Binomial distribution with 6 independent trials, the probabilities of 3 and 4 successes are found to be 0.2457 and 0.0819 respectively. Find the parameter "p" of the binomial.

D) A fair coin is tossed ten times. If getting head is defined as success, out the probability of getting 4 success in the ten trials.

E) Let V={1,2,3,4} and let f={(1,3),(2,1),(3,4),(4,3)} and g={(1,2),(2,3),(3,1),(4,1)}.

Find (a) fog (b) gof (c) fof

F) Suppose a computer installation how 4 **I/0** units (A,B,C and D) and 3 **CPU** (X,Y and Z), any

I/0 units can be paired with any **CPU**. How many ways are there to pair an **I/0** unit with **CPU.** Draw the diagram

Q3) Attempt any three: (15)

A) Suppose that an automobile license plate has three letters followed by three digits.

a. How many different license plate are possible?

b. How many license plates could begin with A and end on 0?

c. How many license plates begins with PQR?

d. How many license plates are possible in which all the letters and digits are distinct?

e. How many license plates could begin with AB and have all three letters and digits distinct.

B) A box contains 7 red, 6 white and 4 blue balls. How many selections of 3 balls can be made so

that a) none is red. b) one is of each colour

C) If 7 colours are used to paint 50 bicycles, then show that atleast 8 bicycles will be of same colours.(pigeon hole principe)

D) Find the degree of the recurrence relations

i) $a_n + 3a_{n-1} = 0$ (ii) $a_n - 8a_{n-1} + 15a_{n-2} = 0$ (iii) $a_{n+3} + 5a_{n+2} + 6a_n = 0$

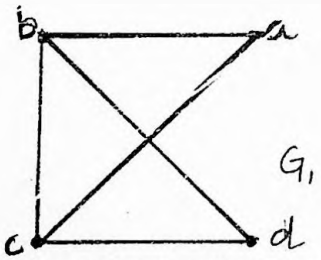
E) Solve the recurrence relation $a_n - 7a_{n-1} + 10a_{n-2} = 0$ with $a_0 = 0, a_1 = 3$.

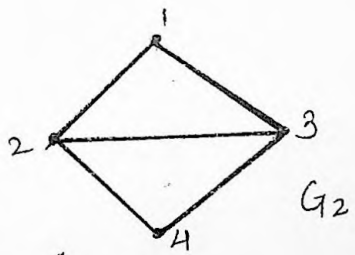
F) How many people are required to guarantee so that atleast two of them are born exactly at

the same time?

Q4) Attempt any three: (15)

A) show that the two graph given below are isomorphic



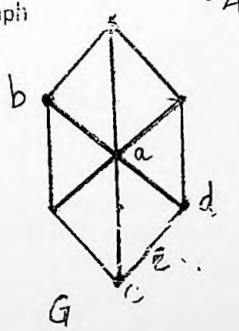


B) for the graph G draw the following subgraph

a) G-e

b) G-a

c) G-b



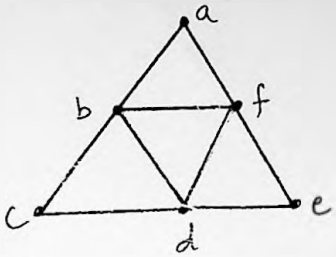
C) Write the definition of null graph, complete graph and subgraph. with example.

D) for the given graph find

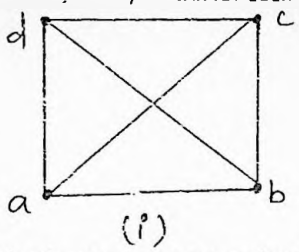
(i)degree of each vertex (iv) verify handshaking theorem

(ii)write adjacency matrix (v) is it a simple graph?

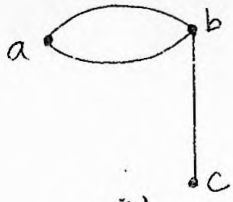
(iii)adjacency list (vi) Describe the graph formally



E) Find the adjacency matrix for each of the following.

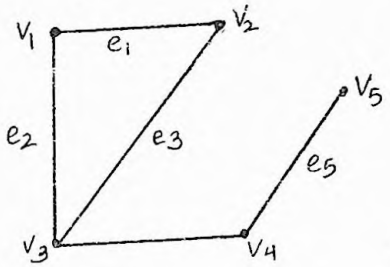


(i)



(ii)

F) Consider the graph and determine the following



i)pendent vertices

ii) pendent edge

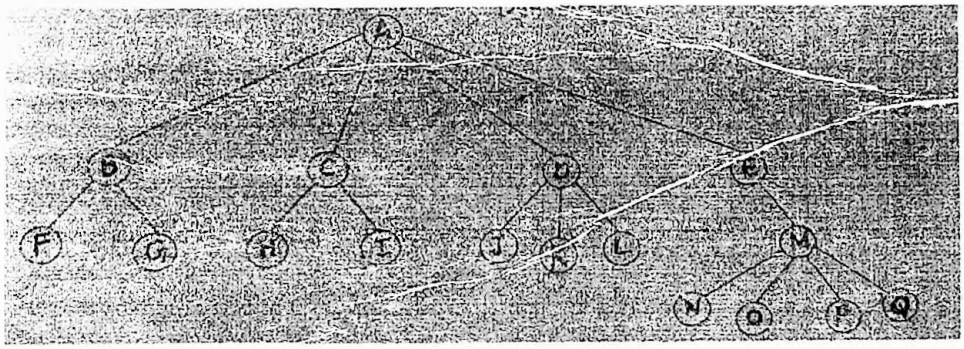
iii) even vertices

iv) odd vertices

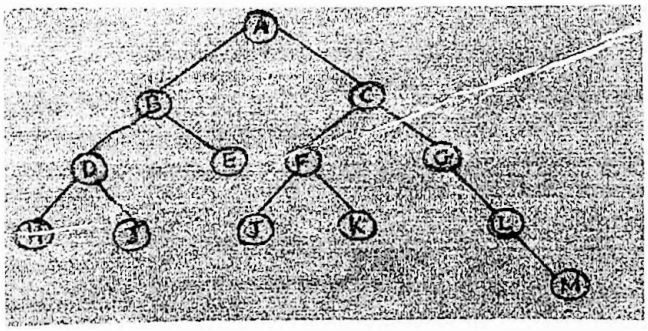
v) incident vertices vi) adjacent vertices

Q5) Attempt any three: (15)

A) the following tree as shown in binary tree.



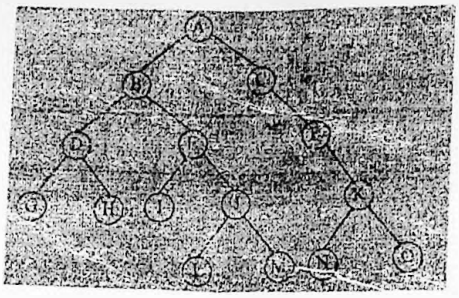
B) Determine the preorder , postoreder and inorder traversal of the binary tree as shown below



C) Using binary tree represent the following expressions

(a) $((a+b)*c)+(d/e)$ (b) $(a+b)*(c/d)$

D) For a given tree



i) Which node is the root? (ii)Which nodes are leaves? (ii)Name the parent node of each node?

E)Draw trees with 1, 2, 3, 4, 5, 6 vertices.

F)Write the definition of general tree, Binary tree, Root, Left child, Right child, Sibling, Leaf.

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