

Max Time: 2½ hrs

FYBSc IT

Max Marks: 75

instructions:

C

02/12/2022

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

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

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

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

05/12/2022

Instructions:

- 1) All questions are **compulsory**.
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- 3) Write in clear, legible, writing.

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- Q I** Attempt any **three** **15**
- A) What are the different types of database system users?
 - B) List and explain the functions of DBA.
 - C) What is DBMS? What are the characteristics of DBMS?
 - D) What is key? What are the different types of keys available in DBMS explain?
 - E) Explain various operators available in Relational algebra.
 - F) Explain Outer JOIN in detail.
- Q II** Attempt any **three** **15**
- A) Explain ER diagram and its notations.
 - B) Explain the term Aggregation.
 - C) What is Strong entity and Weak entity? Explain with example.
 - D) Explain the terms :
 - i) Stored attribute
 - ii) Derived attribute
 - iii) Key attribute
 - E) Write a note on Total participation and partial participation.
 - F) What is relationship in ER model? What are the types of mapping constraints?
- Q III** Attempt any **three** **15**
- A) Write a short note on Functional Dependencies.
 - B) What are the types of functional Dependencies explain in brief.
 - C) List the Armstrong Axioms for Functional Dependencies.
 - D) What is normalization? What is its importance in DBMS design?
 - E) Explain 1NF and 2NF in detail.
 - F) Explain different anomalies with example.

Q IV Attempt any **three**

15

- A) Write a note on DDL and DML statements.
- B) Explain ALTER and TRUNCATE command with suitable example.
- C) Explain INSERT and UPDATE command with suitable example.
- D) What are trigger? Give suitable example.
- E) Define query processing. What are the steps involved in query processing.
- F) Write a short note on Hashing technique.

Q V Attempt any **three**

15

- A) Discuss the ACID properties of transaction processing.
- B) What is transaction? Discuss the state transition diagram and properties of transaction.
- C) Explain Thomas write rule with algorithm.
- D) Describe shadow paging recovery technique.
- E) What is database backup? Explain types of backup.
- F) What is recovery? Explain forward backward recovery.

Max Time: 2½ hrs

FYBSc IT Sem-I Max Marks: 75

CLDS

06/12/2022

Instructions:

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

Subject : CLDS

Q I Attempt any three

(15)

A) . Use mathematical induction to prove that

$$1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6} \quad \text{for all integers } n \geq 1.$$

B) . $A = \{1, 2, 3, 4, 6\}$, Construct the matrix and digraph of R. The relation is defined as

$$R = \{(1,1), (1,2), (1,3), (1,4), (1,6), (2,2), (2,4), (2,6), (3,3), (3,6), (4,4), (6,6)\}$$

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 show that product of any two consecutive positive integers is divisible by 2.

E) . 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 LineF) . Let "A" be the set of integers. Let "R" be a relation on $A \times A$ such that $(a,b)R(c,d) \Rightarrow a+d = b+c$. show that R is an equivalence relation.

Q II Attempt any three

(15)

A) . A class contain 10 boys and 20 girls of which half the boys and half the girls have brown eyes

Find the probability that a student chosen at random is a boy or has brown eyes.

B) . For the following probability distribution :

Obtain (i) $P(X > 2)$ (ii) $P(X \leq 1)$ (iii) $P(X = 2 \text{ or } 3)$ (iv) $E(X)$ (v) $V(X)$

X	-2	-1	0	1	2	3
P(X)	0.1	0.2	0.2	0.3	0.15	0.05

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

I/O units can be paired with any CPU . How many ways are there to pair an I/O unit with CPU.

Draw the diagram.

D) . Find all functions from $X = \{a, b\}$ to $Y = \{u, v\}$.E) . $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, $P(A \cap B) = \frac{1}{4}$.Find a) $P(A/B)$ b) $P(B/A)$ c) $P(A \cup B)$ d) $P(A^c/B^c)$

F) . Define $f:R \rightarrow R$ by the rule $f(x) = 4x - 1$ for all $x \in R$. Show that the given function is bijective function. Find the inverse of f .

Q III Attempt any three

(15)

A) . 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) $a_{n+3} + 5a_{n+2} + 6a_n = 0$

B) . There are four bus lines between A and B; and three bus line from B and C. Find the number Of ways a person can travel:

- a) By bus from A to C by way of B
- b) Round trip by bus from A to C by way of B
- c) Round trip by bus from A to C by way of B, if the person does not want to use a bus line more than once

C) . 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 POR?
- 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.

D) . Solve the recurrence relation $a_n = a_{n-1} + 2a_{n-2}$. The initial conditions are $a_0 = 2$ & $a_1 = 7$.

E) . If 7 colors are used to paint 50 bicycles, then show that atleast 8 bicycles will be of same colors (Hint: Extended Pigeon- Hole Principle)

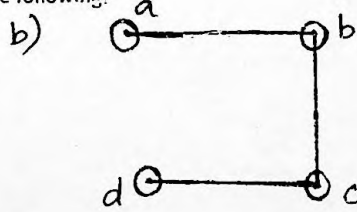
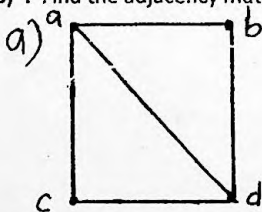
F) . A box contains 7 red, 6 white and 4 blue balls. How many selections of 3 balls can be made so that: a) none is red. b) one is of each colour

Q IV Attempt any three

(15)

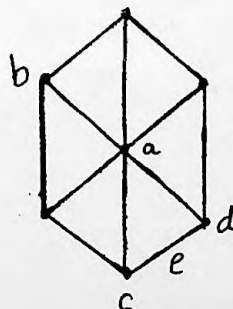
A) . Write the definition of null graph, complete graph and subgraph.

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

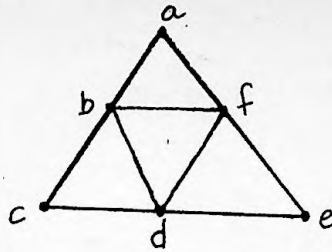


C) . for the graph G draw the following subgraph.

- a) G-e
- b) G-a
- c) G-b

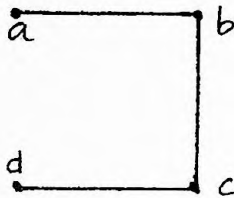
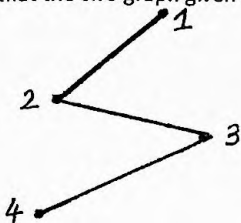


D) . for the given graph find .



- i) degree of each vertex
- ii) write adjacency matrix
- iii) adjacency list
- iv) verify handshaking theorem
- v) is it a simple graph?

E) . show that the two graph given below are isomorphic .

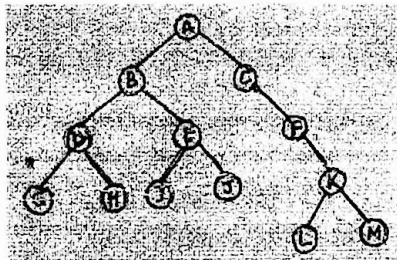


F) . Write the definition of : (i) walk (ii) trivial walk (iii) closed walk (iv) trail (v) path

Q V Attempt any three

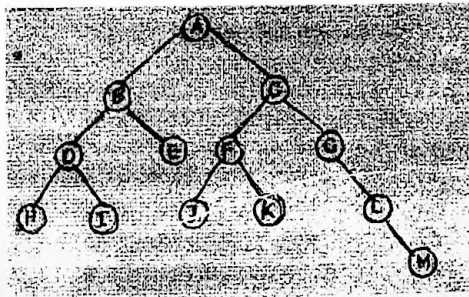
(15)

A) . For the tree find



- i) List of children of each node
- ii) List of siblings
- iii) Find the depth of each node
- iv) Find level of each node

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



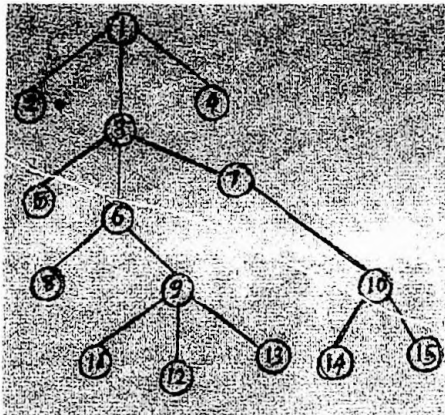
C) . Draw trees with 1, 2, 3, 4, 5, 6 vertices.

D) . Using binary tree represent the following expressions:

(a) $a * b$

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

E) . Convert the following tree as shown in binary tree.



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

Technical Comm.

07/12/2022

Instructions:

- 1) All questions are **compulsory**.
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Q I Attempt any **three**

(15)

- A) What is technical communication? What is the process of technical communication?
- B) What is Non-verbal communication?
- C) Explain the different types of Barriers in Communication.
- D) What is technical communication? What do you mean by Language is a tool of communication?
- E) Explain various forms of Non-verbal communication.
- F) Give the definition of Non-verbal communication and significance of Non-verbal communication.

Q II Attempt any **three**

(15)

- A) Explain the flow of communication and the communication networks.
- B) Explain the importance of Technical communication.
- C) Explain the definition of noise with the help of a suitable example.
- D) Write in Brief About 7c's of Effective Communication.
- E) Write in Brief About Email Etiquettes? Explain with the help of an Example.
- F) What is Group Discussion? Benefits of G.D? Functional and Non- Functional Role of G.D?

Q III Attempt any **three**

(15)

- A) What is listening? Explain the types of listening? Write a note on traits of a good listener.
- B) Differentiate between Active and Passive listening.
- C) Explain the implication of effective listening.
- D) Explain interview, explain objectives of an interview.
- E) Explain in brief, effective presentation strategy.
- F) Explain the different types of interviews?

Q IV Attempt any **three**

(15)

- A) What is business writing? explain the importance of business writing.
- B) Explain the five main strategies.
- C) What is resume? Its format? traditional electronic and video resume?
- D) Differentiate among cooperate reports and business proposal?
- E) What are the steps of writing routine business report?
- F) Write the steps for writing body of a letter?
- G) What is report? Explain with the help of an Suitable Example

Q V Attempt any **three**

(15)

- A) What are the ethical dilemmas faced by the managers?
- B) What are the strategic approach to corporate ethics?
- C) What is MIS? Explain the objectives of MIS.
- D) What is financial communication? Explain in brief the importance of effective financial communication.
- E) What are the elements of financial communication?
- F) What is ethical communication? Write the key principles of ethical communication.

Subject: D.L.A.
Time: 2 1/2 Hrs

Marks: 75

Q.1 Attempt Any three.

- Convert
 - $(365.24)_8 \rightarrow (?)_{10}$
 - $(105)_{10} \rightarrow (?)_2$
 - $(364.25)_8 \rightarrow (?)_{10}$
- Convert
 - $(101100)_2 \rightarrow (?)_{gray}$
 - $(456)_{10} \rightarrow (?)_{bcd}$
 - $(640)_{10} \rightarrow (?)_{excess}$
- What is hamming code explain the structure?
- Explain error detection method?
- Explain 2's complement, also obtain 2's complement of $(10110010)_2$
- With the help of binary arithmetic:
Add $(101101) + (11001)_2$
Sub $(1110) - (1001)$
Mult $(9)_{10} \times (8)_{10}$

Q.2 Attempt Any two.

- State and prove De-Morgan's law
- Describe AND gate & XOR gate with the symbol
- For the logical expression given below draw the K-map and obtain the simplified logical expression
 $Y = \sum m(1, 5, 7, 9, 11, 13, 15)$
- Simplify the expression given below using K-map. The don't care conditions are indicated by $d(\)$:
 $Y = \sum m(1, 3, 7, 11, 15) + d(0, 2, 5)$
- Minimize the following logic function using K-map and verify the answer using the Quine-McCluskey method:
 $Y(A, B, C, D) = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 11, 14)$

Q.3 Attempt Any three.

- What is the combinational circuit / build combination circuit of half adder.
- Explain with an example code conversion from binary to gray.
- Describe the working of 2-bit subtractor.
- What is comparator explain?
- What is Decoder? Explain 2 to 4 line Decoder truth table and logic diagram.
- Draw logical circuit diagram and describe the working of 1:4 demultiplexer.

Q.4 Attempt Any three.

- Design 2-bit magnitude comparator.
- Design BCD to EXCESS-3 code converter.
- Differentiate between latches and flip flop.
- Describe with truth table working of JK flip-flop.
- Explain the terms bushing and preset of a counter?
- Explain SR flip flop using NOR gates?

Q.5 Attempt Any three.

- Write a short note on type of counters.
- Write a short note on type of Shift register.
- Write a short note on type of ring counter.
- Multiply 7 and 14 using booth's algorithm?
- Write a short note on Johnson Counter.
- Explain booth's algorithm?