2018

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The questions are of equal values.

Answer any five questions.

1(a) Define Set. What are the operations on set.

? Give examples on each operations.

(b) If A = {1, 3, 5} and B = {2, 3}, then find :

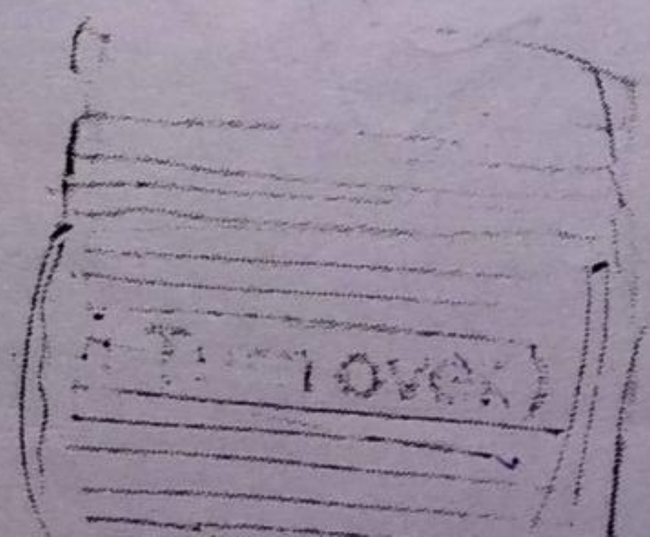
(i) (A × B)

(ii) (B × A)

(iii) (A × A)

(iv) (B × B)

(v) (A × A × A)



2. (a) Given that U = {5, 6, 7, 8, 9, 10, 11, 12}, list the elements of the following sets

(i) A = {x : x is a factor of 60}

(ii) B = {x : x is a prime number}

(b) In a competition, a school awarded medals in different categories. 36 medals in dance, 12 medals in dramatics and 18 medals in music. If these medals went to a total of 45 persons and only 4 persons got medals in all the three categories. How many received medals in exactly two of these categories ?

3. (a) If A = {2, 3, 4, 5, 6, 7} and B = {3, 5, 7, 9, 11, 13} then, find :

(i) A – B

(ii) B – A

(b) What are the differences between Relations and Functions ?

4. (a) Which of the following relations (R) are functions from A to B. Write their domain and range. If it is not a function give reason :

(i) $R = \{(1, -2), (3, 7), (4, 6), (8, 1)\}$

$A = \{1, 3, 4, 8\}, B = \{-2, 7, 6, 1, 2\}$

(ii) $R = \{(1, 0), (1, -1), (2, 3), (4, 10)\}$

$A = \{1, 2, 4\}; B = (0, 1, 3, 10)$

(b) Let I be the set of Integers. Define a relation R on I as follows : xRy if and only if $x - y$ is divisible by S, $\forall x, y \in I$ show that R is an equivalence relation on I.

5. (a) Define the following :

(i) Group

(ii) Semi-Group

(b) Show that $x * y = xy$ is a binary operations on the set N of natural number. Determine whether * is commutative or associative.

6. (a) What are partially order set and their necessary conditions ?

(b) Define Lattice and their properties.

(x) Which of the following relations are functions from A to B. Whether domain and range. If it is not a function give reason

(i) $R = \{(1, -2), (3, 7), (4, 6), (8, 1)\}$

$A = \{1, 3, 4, 8\}, B = \{-2, 7, 6, 1, 2\}$

(ii) $R = \{(1, 0), (1, -1), (2, 3), (4, 10)\}$

$A = \{1, 2, 4\}; B = (0, 1, 3, 10\}$

(b) Let I be the set of Integers. Define a relation R on I as follows : $_xR_y$ if and only if $x - y$ is divisible by S, $\forall x, y \in I$ show thatR is an equivalence relation on I.

5. (a) Define the following :

(i) Group

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(b) Show that $x * y = xy$ is a binary operations on the set N of natural number. Determine whether * is commutative or associative.

6. (a) What are partially order set and their necessary conditions ?

(b) Define Lattice and their properties

(Turn over

7. What are the rules for drawing Hasse diagram ? Give an example.

8. (a) Define Boolean Algebra.

(b) In any Boolean algebra, show that :

(i) $(a + b')(b + c')(c + a') = (a' + b)(b' + c)(c' + a)$

(ii) Express the following Bolean function

$f(x, y, z) = (x + y)(x + y')(x' + z)$

9. Minimize the following Boolean expression using Boolean identities :

$F(A, B, C) = A'B + BC' + BC + AB'C'$

10. (a) What is K map ? What is the use of K-map ?

(b) Use a K-map to find a minimal form of the function :

$F(x, y, z, w) = xyzw + xyzw' + xy'zw' + x'y'zw + x'y'zw'$

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Arabinda

2018

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The questions are of equal value.

Answer any five questions.

1. What is sequential circuit ? Show the Logic diagram of a clocked R-S Flip-Flop with four NAND GATES.

2. Obtain the simplified expression in sum of product for Boolean functions :

$F(A, B, C, D) = \Sigma (2, 3, 12, 13, 14, 15)$

3. Perform the Artithmetic Operations :

(a) $(+42) + (-13)$

(b) (– 42) – (– 13) in binary using

(i) Sig^n 1's Complement Representation

(ii) Sig^n 2's Complement Representation

4 What is the difference between RAM and ROM ? What function does each serve in a microcomputer system ?

5 What is Memory ? Explain primary memory, secondary memory and optical memory with all types in detail.

6. What is Full Adder ? Design a combinational circuit for the full adder and also its truth table.

7 What are Universal Gates ? Which gates are called Universal gates ? And why they are called so explain with example.

8 What is Virtual Memory ? How it is implemented ? Explain in detail.

9 What is Decoder ? Design a BCD to Decimal decoder.

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10 (a) Convert the following numbers to decimal :

(i) 10.10001

(ii) 101110.0101

(iii) 1110101.110

(iv) 1101101.111

(b) Convert the following Octal number to decimal :

(i) $(76)_8$

(ii) $(564)_8$

(iii) $(4261)_8$

(iv) $(5674)_8$

BC — 203

Arrobhi.

2018

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The questions are of equal value

Answer any five questions.

1. (a) Explain Block Structure of C Programming.

   (b) Explain the different types of data types used in C programming.

2. (a) What is Decision Making and Branching ?

   Explain Syntax of :

   (i) IF-ELSE

   (ii) Nesting

   (iii) Switch

(b) WAP in C to check Input year is Leap or not.

3. (a) Differentiate between Entry Controlled Loop and Exit Controlled Loop.

(b) WAP in C to find reverse of any number.

4. (a) What do you mean by array ? WAP to store 10 numbers in an array and find its sum and average.

(b) WAP in C to find array [matrix] addition of two matrix of size [2 × 2].

5. (a) What is the difference between Library function and user defined function ? Explain its any five difference with example.

(b) WAP in C to find factorial of any digit using recursion.

6. (a) Explain any five different string functions used in C.

(b) Explain with difference between call by value and call by reference.

7. (a) Differentiate between array and structure Give one suitable example.

(b) Explain any five properties of pointers.

8. Explain the different operation of Linked List. Write an algorithm to explain Insertion and deletion into circular linked list.

9. WAP in C to arrange any 10 numbers in ascending order using Bubble Sort Method. Also, search a element in sorted array using any searching method.

10. What is stack ? How insertion and deletion operation is performed in stack ? Explain with example.

2019/2020

BC — 301

Anubha.

2018

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The questions are of equal value.

*Answer any **five** questions.*

(System Analysis & Design)

1. (a) Explain the characteristics of a system.
   (b) What do you mean by System Analysis and Design.

2. What is System Development Life Cycle (SDLC) ? Describes its all stages.

3. What is System Analyst and explain the role of System Analyst ?

4. (a) What is the difference between managerial and operational MIS Planning ?
   (b) Explain the strategic of Management Information System (MIS) Planning.

5. What is the difference between Data and Information and what kind of Information do we need ?

6. What are the Information gathering tools and what is the difference between Interview and questionnaires ?

7. What is Feasibility Study and what is Cost/ Benefit Analysis ?

8. What is Testing and Maintenance ? Explain all types of testing and maintenance.

9. What is Quality Assurance in software and what are the goals of quality assurance in system life cycle ?

10. Write short notes on the following :

(a) D. F. D..

(b) Data Dictionary

(c) D. S. S.

(d) Audit Trail