PRAHLADRAI DALMIA LIONS COLLEGE OF COMMERCE & ECONOMICS

REGULAR , OCTOBER, 2022

DEPARTMENT: BSCIT	SEMESTER: I
CLASS: FYBSCIT	SUBJECT: COMPUTATIONAL LOGIC & DISCRETE STRUCTURES
DURATION: 2:30	MARKS: 75

1. Attempt *any three* of the following: **15**

a. A survey of 500 television watchers produced the following information: 285 watch cricket, 195 watch hockey, 115 watch tennis, 45 watch cricket and tennis, 70 watch cricket and hockey, 50 watch hockey and tennis, 50 don't watch any of the 3 games.
i) How many people in the survey watch all the 3 games?
ii) How many people watch exactly one of the three games?

b. Prove by mathematical induction, $1^2 + 2^2 + 3^2 + \ldots + n^2 = \frac{n(n+1)(2n+1)}{6}$ for all integers $n \geq 1$.

c. Consider the relation R defined on A = {p, q, r, s} as:

$$[0\ 1\ 1\ 0\ 0\ 0\ 0\ 1\ 0\ 0\ 1\ 0\ 0\ 0\ 0\ \ 0\ ]$$

Find transitive closure on R using Warshall's Algorithm.

d. Show that the relation R = {(a, b) : a – b = even integer, a, b ∈ Z} in the set of integers Z is an equivalence relation.

e. Find the relation R and draw a digraph from the given matrix relation defined on A = { 2, 4, 6}

$$M_R = [1\ 0\ 1\ 1\ 1\ 0\ 1\ 0\ 1]$$

f. Let A = {a, b, c} , B = { b , c, d} and C = {b, c, e }. Find
i) $A \cup (B \cap C)$, $(A \cup B) \cap C$, $(A \cup B) \cap (A \cup C)$, Which of these sets are equal?
ii) (A – B) – C & A – (B – C). Are these sets equal?

2. Attempt *any three* of the following: **15**

a. Suppose X is discrete random variable having binomial distribution such that: $\frac{p}{q} = \frac{2}{3}$ and P(X =1) = 2P(X = 0). Find the value of n, p, mean and variance.

b. A class contains 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.

c. The probability distribution of random variable is given below:

X	1	2	4	6	8
P(X = x)	K	2k	3k	3k	k

Find : i) k ii) E(X) iii) V(X)

d. Two cards are drawn from a pack of 52 cards without replacement. Find the probability that:
i)both are king ii) both are hearts iii) one is king and other is queen.

e. Let f: R → R be a function defined as $f(x) = x^3$. Show that f is bijective.

f. Three news-paper A, B, C are published in the city, 20% read A, 16% read B and 14% read C. 8% read A & B, 5% read A & C, 4% read B & C and 2% all. For a person chosen at random, find the probability that he reads none of the paper.

3. Attempt *any three* of the following: **15**

a. How many 5 digit integers from 10000 through 99999 are divisible by 5?

b. There are 5 books on Mathematics, 4 on Accounts and 3 on Economics. In how many ways can the books be arranged so that the books on the same subject are together?

c. Find 'n' and 'r' if $C_r^n = 56$ *and* $P_r^n = 336$.

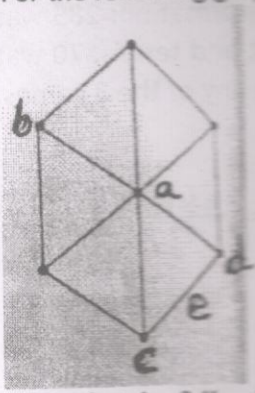
d. If 13 people are assembled in a room, then at least two of them will have their birthdays in the same month.

e. 20 people were invited to the party. In how many ways can hosts and they be seated in a circular table? In how many ways 2 particular persons be seated on either side of the host?

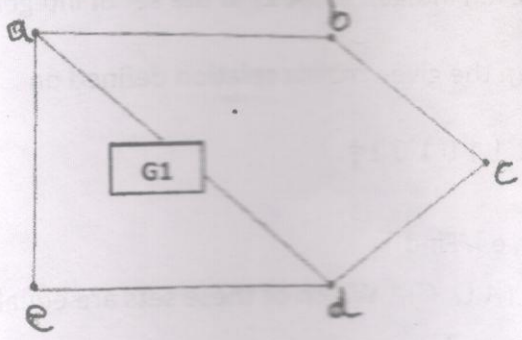
f. How many four digit numbers can be formed out of digits 1, 2, 3, 5, 7, 8, 9 if no digit is repeated in any number? How many of these are greater than 3000?

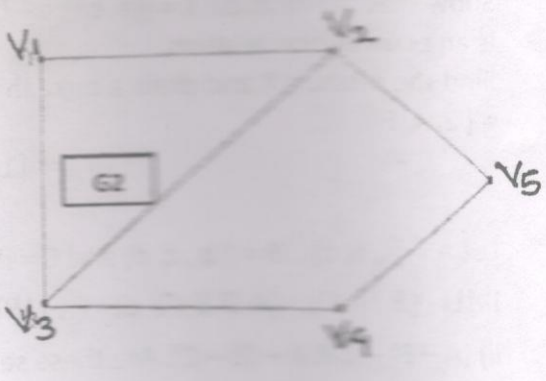
4. Attempt *any three* of the following: 15

a For the following graph, find the sub-graph.

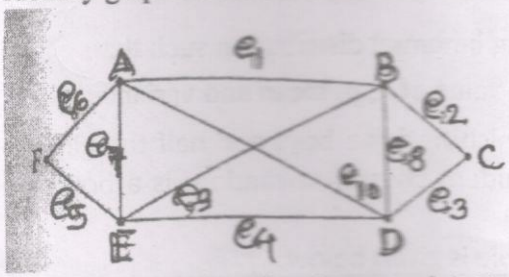


b Show that the following graphs are isomorphic.

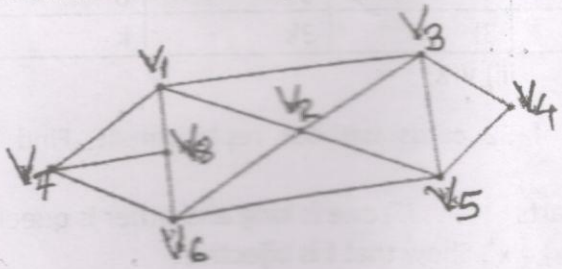




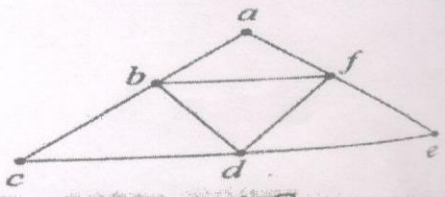
c Identify graph is Eulerian, semi-Eulerian or neither.



d Determine whether the given graph is Hamiltonian.

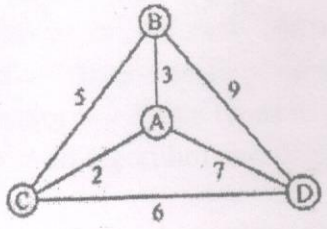


e Determine the i) Vertex set ii) edge set iii) Verify Handshaking theorem & lemma iv) Is it a simple graph? v) Degree of each vertex



Graph G

f Find shortest route for following salesman problem using Nearest Neighbour Method.



15

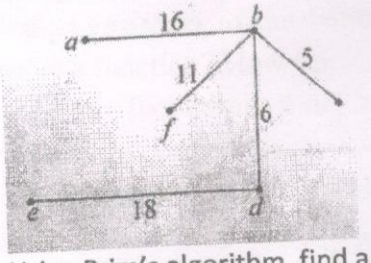
5. Attempt *any three* of the following:

a. Draw a graph, connected nine vertices and edges.

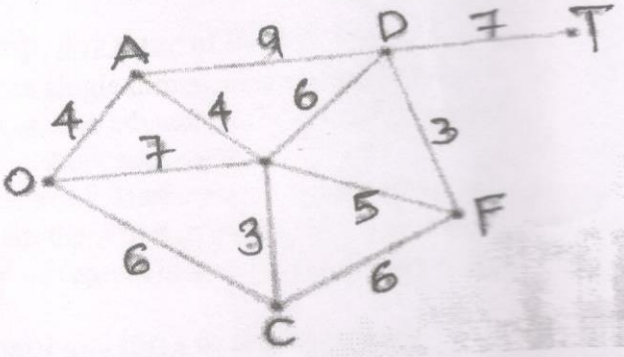
b. Draw Hasse diagram for A = {4, 5, 6, 7} with the partial ordering ≤.

c. Using binary tree represent the following expression:
((3 + x) – (4 * x)) – (x – 2)

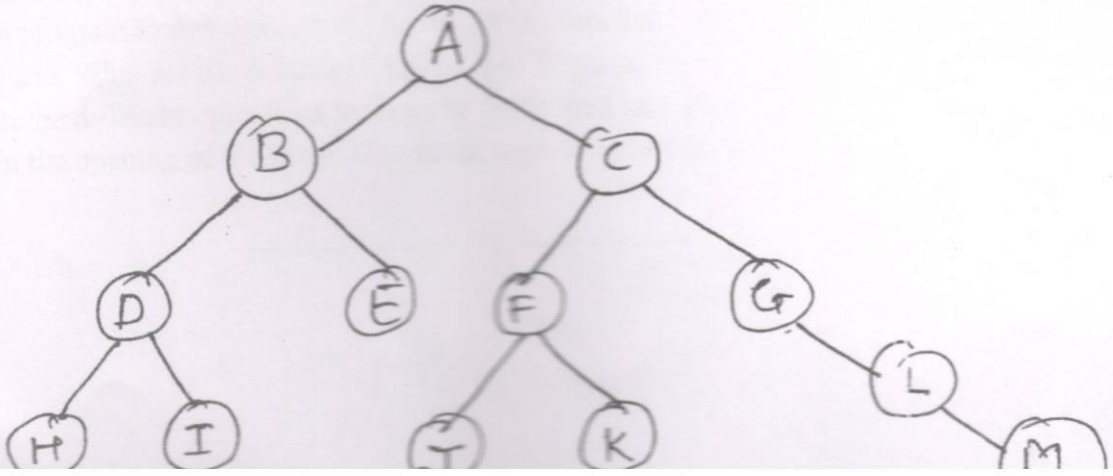
d. Using Krushkal's algorithm, find a minimum spanning tree for given weighted graphs.



e. Using Prim's algorithm, find a minimum spanning tree for given weighted graphs.



f. Determine the preorder, inorder & postorder transversal of binary tree as shown below



PRAHLADRAI DALMIA LIONS COLLEGE OF COMMERCE & ECONOMICS

REGULAR, NOVEMBER, 2022

DEPARTMENT: BSCIT	SEMESTER: I
CLASS: FYBSCIT	SUBJECT: Programming Principles with C
DURATION: 2:30	MARKS: 75

1. Attempt *any three* of the following: **15**

a. Write a short on the history of the C programming language.
b. What is an algorithm? Explain the characteristics of a good algorithm.
c. What are the desirable characteristics of a good program? Explain.
d. Define Identifiers. Explain the rules for naming identifiers.
e. Explain any 4 data types in C with examples.
f. Write an algorithm and draw flowchart to swap values of two variables.

2. Attempt *any three* of the following: **15**

a. What are operators? Explain arithmetic operators with examples.
b. Explain various decision making statements available in C.
c. Explain increment and decrement operators with suitable examples.
d. Distinguish between while and do while loop.
e. Write a short note on break and continue statements.
f. Write a program to calculate the factorial of a given number.

3. Attempt *any three* of the following: **15**

a. What is a function? How function is defined? Explain.
b. Explain any five inbuilt functions of C with example.
c. Write a short note on function with return type and parameter list.
d. What are the advantages of function? Explain.
e. What is standard Input and Output? Explain.
f. What is recursion? Write an example program of recursion.

4. Attempt *any three* of the following: **15**

a Explain single dimensional Array in C.
b What are the advantages of Array? Explain.
c Write a short note on pointers in C.
d Define array. How array is declared? Explain.
e Explain the sizeof operator in C with a suitable program.
f Write a program to accept and display rollno of five students using an array.

5. Attempt *any three* of the following: **15**

a. Define structure. Explain the difference between a variable and a structure.
b. Explain the syntax of declaring a structure with suitable examples.
c. Write a program to demonstrate the use of fputs() function.
d. Define file. What are the different types of file? Explain.
e. Explain the different operations that can be performed on a file.
f. Explain the opening of the file in C with the help of a program.

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REGULAR , NOVEMBER, 2022

DEPARTMENT: BSCIT	SEMESTER: I
CLASS: FYBSCIT	SUBJECT: DIGITAL LOGIC & APPLICATIONS
DURATION: 2:30	MARKS: 75

Q.1 Attempt any 3 **(3*5=15)**

a) Explain AND and EX-OR gates along with waveforms. (5)

b) Perform subtraction using two's complement : (5)

1) 12-04 2) 13-17

c) Perform conversion : (5)

1) Decimal to Binary : $(158.243)_{10}$

2) Gray code to binary: (10100)

3) Octal to Hexadecimal : $(157.354)_8$

d) Hamming code received by the receiver is 1101110.Find the error in the code if any. (5)

e) Write a short note on error detection. (5)

f) Perform the following : (5)

1) Decimal to Hexadecimal : $(4239.345)_{10}$

2) Binary division : 101011 ÷ 10

3) Octal to Decimal : $(152.253)_8$

Q.2 Attempt any 3 **(3*5=15)**

a) Prove that LHS = RHS : (XY' + X'Y').(XZ')=XY'Z' (5)

b) Simplify using Boolean laws : A.B'+(A'+B'+C.C')' (5)

c) Realize the following equation : (A'+C)' . (A+B)' +(AC+D') (5)

d) Simplify the following using K Maps : Y= Σ m (0,1,2,3,7,8,9,10,14)+ d(5,11) (5)

e) Simplify the following using K Maps : Y= Π M (0,1,2,4,5,7,8,11,13) (5)

f) Simplify the following using Quine McCluskey : Y= Σ m (4,8,9,10,11,12,14,15) (5)

(3*5=15)

Q.3 Attempt any 3

a) Design a combinational circuit for 4 input and 1 output such that the output is 1 only if the no of Ones in the input are two or more than two. (5)

b) Write a short note on Full Subtractor. (5)

c) Design a Binary to gray code convertor. (5)

d) Explain 4:1 MUX. (5)

e) Design a 4:2 Encoder. (5)

f) Design a 1:8 DEMUX using two 1:4 DEMUX. (5)

(3*5=15)

Q.4 Attempt any 3

a) Explain the clocked SR Flip Flop. (5)

b) Write a short note on Parallel in Serial Out Shift Registers. (5)

c) Explain the D Flip Flop. (5)

d) Explain the Serial in Parallel out shift register. (5)

e) Write a short note on conversion of SR to T flip flop. (5)

f) Write a short note on Synchronous Counters. (5)

(3*5=15)

Q.5 Attempt any 3

a) Explain IC 74181 in detail. (5)

b) Explain the Multiplication Algorithm. (5)

c) Multiply 12 x 14 using the shift and add method. (5)

d) Divide 13/6 using the restoring method of division. (5)

e) Perform division of 1101 ÷ 11 using restoring division. (5)

f) Multiply 12 with 6 in the register. (5)

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REGULAR , NOVEMBER, 2022

DEPARTMENT: BSCIT	SEMESTER: I
CLASS: FYBSCIT	SUBJECT: Technical Communication Skills
DURATION: 2:30 hrs	MARKS: 75

1. Attempt *any three* of the following: **15**

a. What is grapevine? Discuss characteristics of an informal communication network.
b. Diagrammatically explain the process of communication.
c. What are the common causes of interpersonal barriers?
d. List down the factors affecting cross cultural business communication.
e. Discuss the types of Nonverbal communication.
f. Write a short note on facial expression.

2. Attempt *any three* of the following: **15**

a. What do you understand by YOU approach in the 7C's of effective communication?
b. Discuss the essentials of business communication.
c. Short note on Meetings.
d. Explain the 3 most common types of teleconference.
e. Discuss the four major areas of evaluation in Group discussion.
f. List down the email etiquettes.

3. Attempt *any three* of the following: **15**

a. Discuss the stages of job interview.
b. Explain the 4 modes of delivery that can be used for making presentation.
c. Short note on nervousness & stage fright.
d. Discuss the traits of good listener.
e. Discuss the implication of effective listening.
f. Discuss the basic things one should do during the interview.

4. Attempt *any three* of the following: **15**

a. Discuss the 5 main strategies for writing business message.
b. Discuss the advantage of online recruitment.
c. Discuss the parts of a Report.
d. Explain the essential qualities if a good business letter.
e. Explain the three formats of traditional resume.
f. Short note on Business proposal.

5. Attempt *any three* of the following: **15**

a. Rehearsal & practice before the presentation makes a difference in one's performance. Elaborate.
b. Explain the concept of brainstorming.
c. Elaborate the ethical perspectives of communication.
d. Discuss the types of visual communication aids.
e. Short note on Ethics in business communication.
f. Explain the Tips to use the elements of financial communication.
