No. of Printed Pages : **3**

21BCA2C6DML

B.C.A. II Semester (NEP) Degree Examination,
September/October - 2022

COMPUTER SCIENCE

Discrete Mathematical Structures

Time : 3 Hours Maximum Marks : 60

SECTION-A

1. Answer the following sub-questions. Each carries **one** mark. **10x1=10**

(a) Define Set.

(b) Define Matrix.

(c) Define Pigeon hole principle.

(d) What is domain and co-domain ? Give example for each.

(e) Evaluate 8!

(f) Find $5C_3$

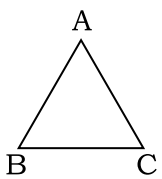
(g) Let A={1,2,3}, A={1,2,3}

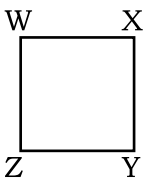
Find A×A=?

(h) What is planar graph ? Give example.

(i) Define Hamilton path.

(j) Write the vertices and edges of the following graphs.

(i) 

(ii) 

P.T.O.

SECTION - B

Answer **any four** from the following questions. **4x5=20**

2. Define union of set

If A={1, 2, 3, 4}

B={3, 4, 5, 6}

C={5, 6, 7, 8}

Find (AUB)∩C

3. How many 3 digit numbers can be formed from the digits 1, 2, 3, 4, 5 assuming that repetition of the digit is not allowed.

4. Determine whether each of the following relations are reflexive and symmetric. Relation R is in the

Set

A={1, 2, 3, ...14}

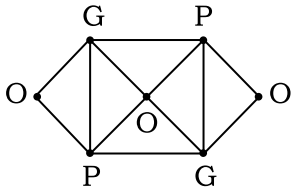
defined as

$R=\{(x, y) : 3x-y=0\}$

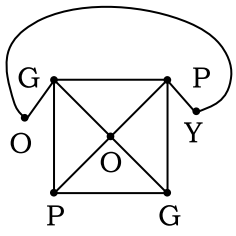
5. Explain the different types of graphs.

6. What is chromatic number ? Write the chromatic number of the following graphs.

(a)



(b)



O - Orange P - Pink

G - Green Y - Yellow

7. In how many ways can a team of 3 boys & 3 girls be selected from 5 boys and 4 girls.

SECTION - C

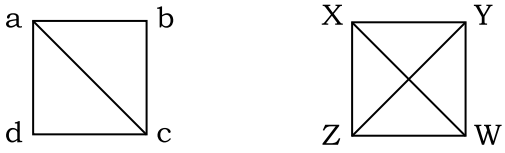
Answer **any three** from the following questions. **3x10=30**

8. Define Function
let A={a, b, c, d}
B={1,2,3,}
R={(a, 2), (b, 1), (c, 2), (d, 1)}
Is R a function ? why ?

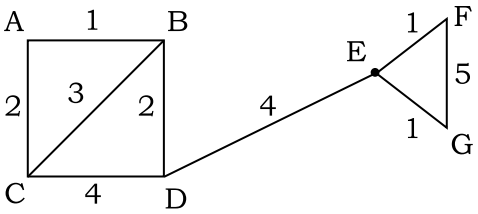
9. How many words with or without meaning can be formed using all the letters of the word EQUATION using each letter exactly once ?

10. Explain the properties of relations.

11. Show that the following two graphs are isomorphic.



12. Find the shortest path for the following graph [From C TO G]



Source : C
Destination : G

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