Mid-West University

Examinations Management Office

Semester End Examination 2080

Bachelor level/ B. Sc. (CSIT)/ II Semester **Full Marks: 60**

Time: 3 hours **Pass Marks: 30**

Subject: Discrete Structure (COM421)

Candidates are required to give their answers in their own words as far as practicable. Figures in the margins indicate marks.

Group A

Very short questions (*Attempt all the questions*). **8 x 2 = 16**

1. Define Contradiction with suitable example.
2. Define Konigsberg bridge problem.
3. If there are 24 boys and 18 girls in a class, find the number of ways selecting one student as Class representative.
4. State Binomial Theorem.
5. What do you mean by multi-graph.
6. Define factorial function.
7. What do you mean by equivalence relation?
8. Write the three forms of implication.

Group B

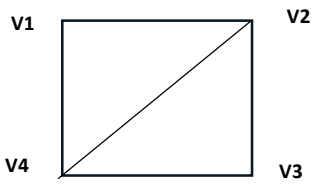
Short answer questions (*Attempt any five questions*). **5 x 4 = 20**

9. Let F(x, y):x=y+6. Find the truth value of F(1,5) and F(6,0).
10. In how many ways can a hand of 4 cards be dealt from an ordinary pack of 52 playing cards?
11. Write down the expansion of $(1+y)^6$ using pascals triangle.
12. Let A {4,5,6}, find the relation in AxA under the condition x+y<10. Also find domain and range of relation.
13. Use binary tree to represent the expression. **(i)** (a+b) * (c-d) **(ii)** (a+b)*c
14. Illustrate depth first search and breadth first search with example.

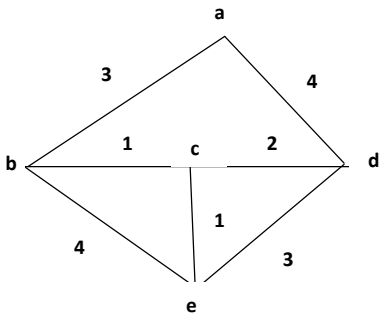
Group C

Long answer questions (*Attempt any three questions*). **3 x 8 = 24**

15. What do you mean by Degree of Tree? Define Spanning Tree. Write all the spanning trees of the graph G shown in figure below.



16. Show step by step how Kruskal's algorithm can be used to find a minimum spanning tree for a given graph.



17. State Modus Ponens Law. For each given set of premises, what relevant conclusion can be drawn? If I eat spicy food, then I have strange dreams. I have strange dreams if there is thunder while I sleep. I didn't have strange dreams.
18. Prove that the compound proposition is tautology. (p → q) Λ $(\neg q) \rightarrow (\neg p)$. Define Cycle graph with example.

The End