End Semester Examination

May-June 2023

COS1071B - Discrete Mathematics

Schedule ID: 13175
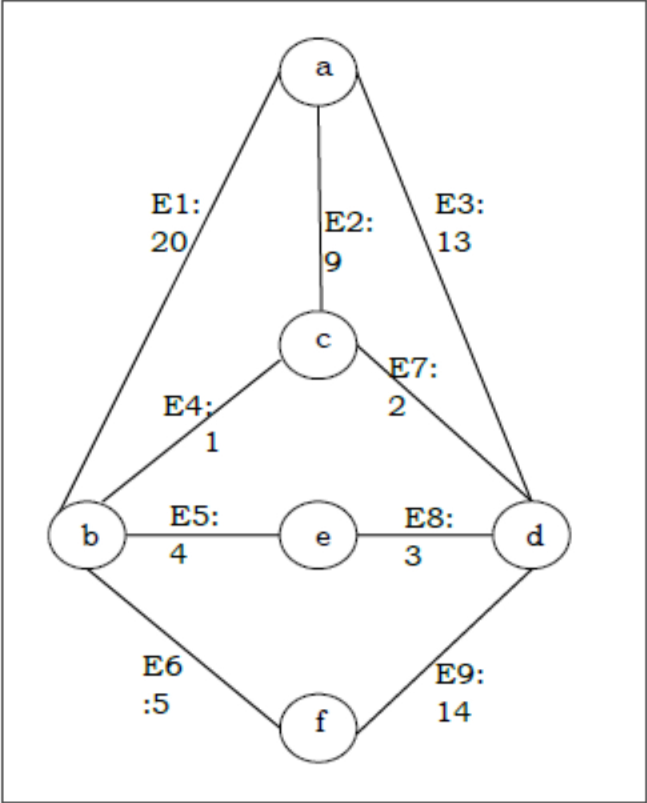
Faculty/School	Faculty of Science	Term	Semester II
Program	FYBCA	Duration	1 Hours 30 Minutes
Specialization	--	Max. Marks	40

Read the instructions provided for every question properly before attempting the answer.

Section 1 - [7 Questions, 8 Marks] (5 X 8 Marks)
Answer any 5 questions

1	A) How many arrangements of "MANAGEMENT" are there in which the two M's are separated. B) How many different numbers can be formed from the digits 0,2,3,4,5,6 lying between 100 and 1000 in which no digit is being repeated? How many of them are not divisible by 5?	8 marks	CO4	Remembering
2	Describe Surjective, Injective, Bijective, Inverse of a function. Elaborate with Examples.	8 marks	CO1	Understanding
3	Define Reflexive closure, Symmetric closure along with a suitable example. Let R be a relation on Set S= {a, b, c, d, e), given as R = {(a, a),(a, d), (b, b) , (c, d) , (c, e) , (d, a), (e, b), (e, e)} Find transitive closure using Warshall's Algorithm.	8 marks	CO2	Evaluating

4	Using Dijkstra's Algorithm, find the shortest distance from source vertex 'S' to remaining vertices in the following graph-	**8 marks**	CO3	Applying
5	a. State the difference between Eulerian and Hamiltonian graph with example. b. A bag contains beads of two colors: black and white. What is the smallest number of beads which must be drawn from the bag, without looking so that among these beads, two are of the same color?(use Pigeonhole Principle)	**8 marks**	CO2,CO3	Analysing
6	Construct the minimum spanning tree (MST) for the given graph using Prim's Algorithm-	**8 marks**	CO5	Evaluating

| 7 | Identify the minimum spanning tree from the following graph G by using the Kruskal's algorithm. | **8 marks** | CO4 | Evaluating |

END OF QUESTION PAPER