JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS- 2026

BCA II Semester/B.Tech IV Semester (Mathematics and Computing)

COURSE CODE (CREDITS): 25B11MA213(04) MAX MARKS: 35

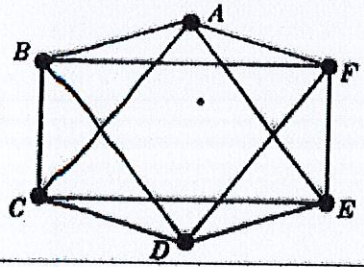
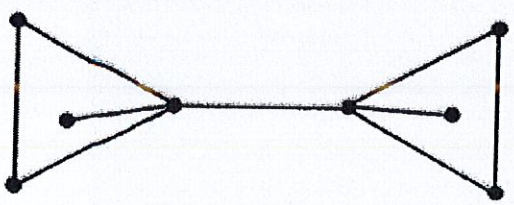
COURSE NAME: Discrete Computational Mathematics

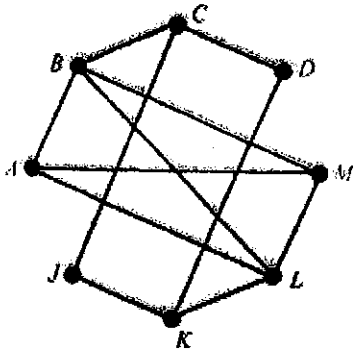
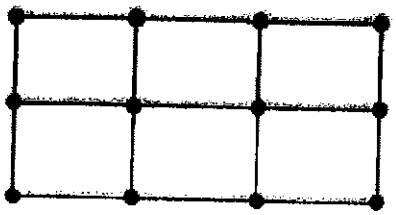
COURSE INSTRUCTOR: NKT MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculator is not allowed

Q.No	Question	CO	Marks
Q1	Let the relations P and Q on set $A = \{1,2,3,4\}$ are defined by $P = \{(a,b): \lvert a-b \rvert = 1\}$ and $Q = \{(a,b): a-b \text{ is even}\}$ Find PoQ , PoP, QoQ and represent them as matrices.	CO-1	2
Q2	Solve the recurrence relation with the help of generating function $a_r = 3a_{r-1} + 2, \quad r \geq 1$ and $a_0 = 1$	CO-1	3
Q3	Check the validity of the following argument: If Raj works hard then he is a dull boy. If raj is a dull boy then he will not get a job. Therefore Raj will not get the job.	CO-2	3
Q4.	Show that the lattice D_{105} is distributive and complemented.	CO-3	3
Q5	(a) Draw four graphs which are 2 regular. (b) Draw the planar representation of the graph if possible 	CO-4	4
Q6	For the graph 	CO-4	5

	Show that sum of degrees of the regions are twice the number of edges and verify Euler's formula.		
Q7.	Find the chromatic number of the graph  Using Welch-Powell algorithm.	CO4	5
Q8	Make the dual representation of the graph 	CO-4	5
Q9.	Shoe that the set $G = \{1,2,3,4,5,6\}$ under multiplication modulo 7 is a group.	CO-5	5