PVP 14

Code: CS3T1

II B.Tech - I Semester–Regular/Supplementary Examinations
November 2017

DISCRETE MATHEMATICS
(COMPUTER SCIENCE & ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11x 2 = 22 M

1.

a) Show that ~(P^Q) → (~PV(~PVQ)) ⇔ (~PVQ)
b) (P→ (Q→R)) ^ (~P → (~Q^~R)) is this formula is tautology?
c) Determine whether the conclusion C is logically follows from the premises H1 & H2 in the following case
H1: P→Q H2: ~ (P^Q) C: ~P
d) Write the following statement into symbolic form:
"Some real numbers are rational"
e) If S_n is the set of all divisors of the positive integer n and D is the relation of division then prove that (S_{24}, D) is a lattice.
f) Define homomorphism.
g) Define directed graph with an example.
h) What is minimal spanning tree? Explain with an example.
i) Define Euler circuit with an example.
j) Find the chromatic number of the following graph.
k) With an example explain complete bipartite graph.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Construct the truth tables of the following formulas.

i) [PV(Q^R)] ↔ (PVQ) ^ (PVR) 4 M

ii) [(P→Q) ^(Q→R)] → (PVR) 4 M

b) Without using truth table show the following equivalences.

i) (~P ^ (~Q^R)) V (Q ^R) V (P^R) ⇔ R 4 M

ii) (P→Q) ^ (R→Q) ⇔ (PVR) → Q 4 M

3. Show that:

a) R ^(PVQ) is a valid conclusion from the premises.

PVQ, Q→R, P→M, ~M 8 M

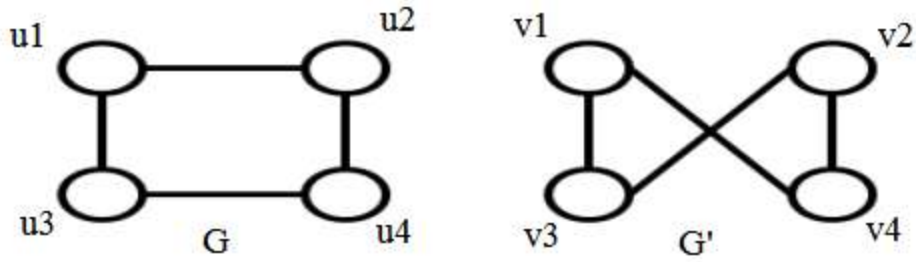
b) (x)(p(x) →R(x)),

(∃ x)(P(x) ^ S(x)) => (∃ x) (R(x) ^ S(x)) 8 M

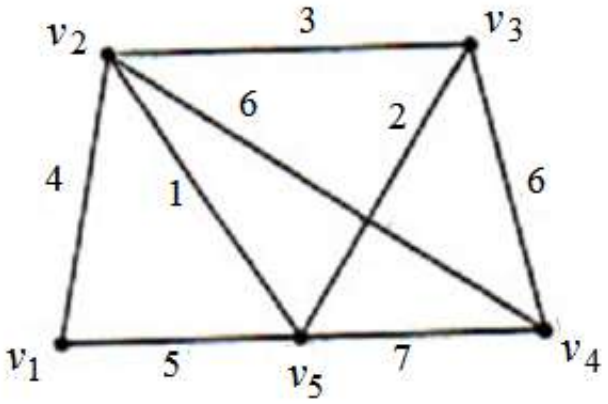
4. a) Which of the two lattices $<S_n, D>$ for n=30 and n=45 are complemented? Are these lattices distributive? 8 M

b) Given L={0,1} develop the diagrammatic representation for lattice (L,≤). 8 M

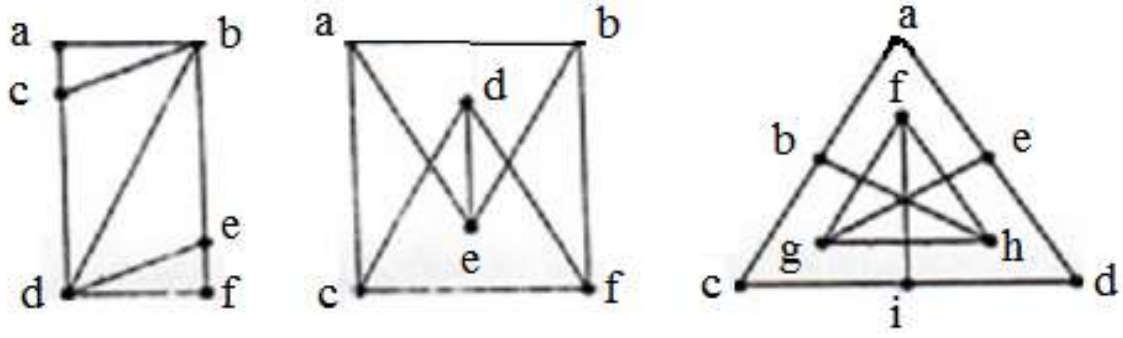
5. a) Show that the graphs G and G' given below are isomorphic. 8 M



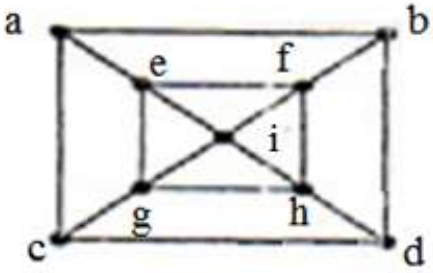
b) Using Prim's algorithm find a minimal spanning tree for the weighted graph shown below. 8 M



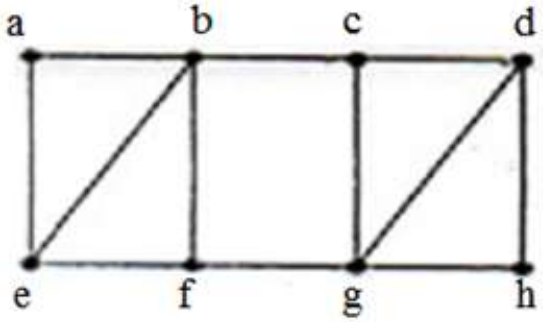
6. a) Discuss about Planar and non planar graphs with an example. Show that the following graphs ape planar by redrawing them. 8 M



b) Show that the following graphs are Hamiltonian but not Eulerian. 8 M



graph-1



graph-2