16.8.2019

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE -27
B.C.A I SEMESTER
MID SEMESTER EXAMINATION : AUGUST 2019
CA 1218 – DISCRETE MATHEMATICS

Time – 1 hour **Max Marks-30**

Answer any five of the following **5*6 =30**

1. Show that
$$(\neg P \rightarrow R) \wedge (Q \leftrightarrow P) = (P \vee Q \vee R) \wedge (P \vee \neg Q \vee R) \wedge (P \vee \neg Q \vee \neg R) \wedge (\neg P \vee Q \vee R) \wedge (\neg P \vee Q \vee \neg R).$$
2. Obtain the principal disjunctive normal form and principal conjunction form of the statement
$p \vee (\neg p \rightarrow (q \vee (\neg q \rightarrow r)))$
3. Give an example of a graph which is
   a) Euleran but not Hamiltonian (b) Hamiltonian but not Euleran
   (c) Hamiltonian and Euleran (d) neither Hamiltonian nor Euleran

4. Draw a Graph using Adjacency Matrix.

$$\begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 1 \\ 1 & 0 & 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 1 & 0 & 1 \\ 1 & 1 & 0 & 0 & 1 & 0 \end{bmatrix}$$

5. State and prove pentageon theorem.

6. Define Path,Walk and Circuit with an example.

7. In any group (G,*) Show that $(a * b)^{-1} = b^{-1} * a^{-1}$ for all a b, $\in$G.