RAMAKRISHNA MISSION VIDYAMANDIRA
(Residential Autonomous College affiliated to University of Calcutta)

SECOND YEAR [BATCH 2017-20]
B.A./B.Sc. FOURTH SEMESTER (January – June) 2019
Mid-Semester Examination, March 2019

Date : 26/03/2019

COMPUTER SCIENCE (General)

Time : 1 pm – 2 pm   Paper : IV   Full Marks : 25

[Use a separate Answer Book **for each group**]

Group – A

Answer **any one** question :   [1×2·5]

1) a) Briefly discuss about different transmission impairments such as Attenuation, Distortion and Noise. (1.5)

   b) What is MAC address? (1)

2) a) What is Router, Switch and Gateway? (1.5)

   b) What do you mean by Time To Live (TTL) of a packet? (1)

Answer **any two** questions :   [2×5]

3) a) Briefly discuss about different functions of Data-Link layer and Network layer. (2+2)

   b) What is Stop and Wait Protocol? (1)

4) a) Briefly discuss about different classes of IPv4. (3)

   b) What are the advantages of Bus topology over Ring topology? (2)

5) a) What is the remainder obtained by dividing $x^7 + x^6 + x^5 + 1$ by the generated polynomial $x^3 + 1$? (3)

   b) What are socket, port, logical address and communication protocol? (2)

Group – B

Answer **any one** question: [1×2·5]

6) a) Draw a graph on six vertices with degree sequence (3, 3, 5, 5, 5, 5); does there exist a simple graph with these degrees? (1.5)

   b) How are your answers to part (a) changed if the degree sequence is (2, 3, 3, 4, 5, 5)? (1)

7) If G is a simple graph with at least two vertices, prove that G must contain two or more vertices of the same degree. (2.5)

Answer **any two** questions: [2×5]

8) a) "A connected graph G is Eulerian iff the degree of each vertex of G is even" - Prove it. (3)

   b) Define "fusion" with a suitable example. (1)

   c) What do you mean by "arbitrarily traceable graph"? (1)

9) Explain Kruskal's algorithm with a suitable example. (5)

10) a) "The distance between vertices of a connected graph is a metric" - Prove it. (3)

   b) Define "eccentricity" and "bicenters" of a graph. (2)

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