RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

SECOND YEAR [BATCH 2016-19]

B.A./B.Sc. FOURTH SEMESTER (January – June) 2018

Mid-Semester Examination, March 2018

Date : 15/03/2018 **COMPUTER SCIENCE (General)**

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

[Use a separate Answer Book for each group]

Group – A

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

   a) i) Briefly discuss about different transmission modes with suitable example. [1·5]

   ii) What is point to point connection? [1]

   b) i) What is the differences between services and protocols? [1·5]

   ii) Is an oil pipeline is half duplex, full duplex or simplex? – justify your answer. [1]

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

   a) i) Briefly discuss about different functions of transport layer and application layer. [4]

   ii) Why error control and flow control mechanism is performed in datalink layer as well as transport layer is OSI model? [1]

   b) i) Discuss the following fields of IP datagram header. [0·5×6]
   TTL, HLEN, FRAGMENTATION, OFFSET, SERVICE TYPE, PROTOCOL

   ii) What is the difference between OSI model and TCP/IP model? [2]

   c) i) What do you mean by different classes of IP address? Explain with example. [3]

   ii) Compare and contrast star topology with mesh topology using real world example. [2]

Group – B

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

   a) i) Define Self complementary graph. [1]

   ii) When a walk can be identified as an Euler line? Give suitable example. [1·5]

   b) "A given connected graph G is an Euler graph iff all its Vertices are of even degree" – Justify. [2·5]

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

   a) i) Prove that " A connected graph G is an Euler Graph iff it can be decomposed into circuits". [2·5]

   ii) What is the total no of edges in a complete graph G? How do you prove it? [1+1·5]

   b) i) Prove that "Any connected graph with n/vertices and (n – 1) edges is a tree." [2]

   ii) Prove that "A simple graph G with n vertices and K components can have at most $\frac{(n-K)(n-K+1)}{2}$ edges." [3]

   c) i) Prove that in a binary tree T the number of pendant vertices is equal to $\frac{(n+1)}{2}$, where n is the number of vertices in T. [2]

   ii) Write down prim's algorithm to find out MST of a graph G. [3]

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