

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

SECOND YEAR [BATCH 2015-18]

B.A./B.Sc. FOURTH SEMESTER (January – June) 2017

Mid-Semester Examination, March 2017

Date : 16/03/2017

COMPUTER SCIENCE (General)

Time : 12 noon – 1 pm

Paper : IV

Full Marks : 25

[Use a separate Answer Book for each group]

Group – A

Answer any one question from Question Nos. 1 & 2 :

[1×2·5]

1. a) Differentiate between protocol and standard. [1·5]
b) Define : Peer-to-peer process. [1]
2. a) Differentiate between MAC address, IP address and port address. [1·5]
b) Write down one practical example of mesh topology. [1]

Answer any one question from Question Nos. 3 & 4 :

[1×10]

3. a) An organization is granted the block 211·17·180·0/24. The administrator wants to create 32 subnets.
 - i) Find the subnet mask.
 - ii) Find the number of addresses in each subnet.
 - iii) Find the first and last addresses in subnet-1.
 - iv) Find the first and last addresses in subnet-32. [1+1+(1+1)+(1+1)]
- b) What is the advantage of using bridge as a networking device? [2]
- c) Why IP address is called 'universal'? [2]
4. a) Explain the basic routing process by showing the routing table of a router. Also explain how a packet is forwarded through an interface of that router. [4+2]
- b) Show the original unabbreviated form of the following address. 0 : 234 :: 3 [2]
- c) '190·16·42·0 can not be the beginning address of a block containing 1024 addresses' —Justify. [2]

Group – B

Answer any one question from Question Nos. 5 & 6 :

[1×5]

5. a) Prove that "Every graph with n vertices and k edges has at least (n–k) components". [2·5]
b) Prove that "Every closed odd walk contains an odd cycle". [2·5]
6. a) Prove that "Every tree has a center consisting of either one point or two adjacent points". [2·5]
b) Prove that "Graph G is acyclic and if any two adjacent points of G are joined by a line X, then (G+X) has exactly one cycle". [2·5]

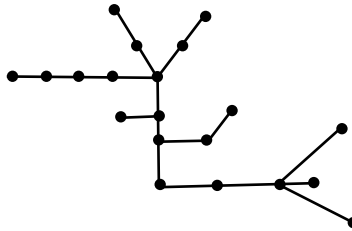
Answer any one question from Question Nos. 7 & 8 :

[1×7·5]

7. a) Prove that "A simple graph with n vertices and k components can have at most $\frac{(n-k)(n-k-1)}{2}$ edges". [4]
b) Prove that "A connected graph G is an Euler graph iff it can be decomposed into circuits". [2·5]
c) What is fusion? [1]

8. a) Find out eccentricity, radius and diameter of the following graph.

[1+0.5+0.5]



b) Find out the weights of the points of the above graph.

[1.5]

c) State the condition(s) to decompose a graph G into two subgraphs g_1 and g_2 .

[1]

d) How many binary trees can be constructed from n vertices?

[1]

e) Justify the statement : “Walk can't be Euler line”.

[2]

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