

(Time: 2 ½ Hours)

[Total Marks: 60]

N. B.: (1) All questions are compulsory.(2) Make suitable assumptions wherever necessary and state the assumptions made.(3) Answers to the same question must be written together.(4) Numbers to the right indicate marks.(5) Draw neat labeled diagrams wherever necessary.(6) Use of Non-programmable calculator is allowed.

1. **Attempt any two of the following:** 12
 - a. What are the different components of networking? Explain.
 - b. What is Quality of Service (QoS)? How many classes does quality of service policy support?
 - c. Explain Ethernet, Ethernet data rate, Wi-Fi Data Rates, 4G/5G Cellular, fifth Generation.
 - d. Describe various congestion control techniques used in computer networks.

2. **Attempt any two of the following:** 12
 - a. What is Software defined network? With the help of diagram, explain SDN architecture.
 - b. What are the general limitations of traditional network architectures found by Open Networking Foundation (ONF)?
 - c. Explain traffic engineering in detail.
 - d. What is Wireless information – centric networking CCN? Explain.

3. **Attempt any two of the following:** 12
 - a. Differentiate between Integrated Services and Differentiated Services.
 - b. Discuss the different types of functions performed by the data plane network devices.
 - c. What are QoE measurement methods? Explain any one in detail.
 - d. List and explain the characteristics of Software-Defined Networking.

4. **Attempt any two of the following:** 12
 - a. What are QoS/QoE Mapping Models? Describe Black-Box Media-Based QoS/QoE Mapping Model.
 - b. Differentiate between QoE and QoS Service Monitoring.
 - c. List and discuss factors influencing QoE.
 - d. Draw diagram of QoE/QoS Layered Model with the Domains of Interest for the frameworks.

5. **Attempt any two of the following:** 12
 - a. Explain Software-defined Security. Describe NFV Security.
 - b. What is RFID? Explain the working of RFID, Sensors and Actuators.
 - c. Discuss cloud services as defined by NIST.
 - d. What are elements of cloud security as a service? Explain.