1.

a) Describe the Characteristics of regular delta networks.

[5 marks]

b) Design a four stage delta-2 network.

[5 marks]

c) Describe the self-routing algorithm used by delta-2 networks.

[3 marks]

d) Describe the criteria, which must be satisfied for a Banyan network to be non-blocking, and show that they are sufficient. Also describe how these criteria are implemented in practice.

[12 marks]

2.

a) Outline the procedure used to design store-forward backbone networks and explain the steps involved.

[7 marks]

b) Describe in details how network topologies are constructed using the link deficit algorithm (Steiglitz et al.) and discuss how k-connectivity can be assured.

[7 marks]

c) Using Kleinrock's method, show how a set of line capacities which will minimise the total cost of the network can be determined subject to a constraint on the mean delay for the network.

[11 marks]

3.

a) Discuss the characteristics of synchronous, isochronous and asynchronous packet data traffic, and outline their Quality of Service (QoS) requirements.

[5 marks]

b) Describe the media access control employed by the Fibre Distributed Data Interface (FDDI) and the mechanism it uses to support the QoS requirements of both synchronous and asynchronous traffic.

[10 marks]

c) Describe the media access control employed by the Distributed Queue Dual Bus (DQDB) and the mechanism it uses to support the QoS requirements of both synchronous and asynchronous traffic.

[10 marks]