QUESTION ONE

a) Identify and describe the components that make up a cellular system (8 marks)

b) Explain the operation of the following cellular technologies

i) CDMA (code division multiple access) (4 marks)

ii) TDMA (time division multiple access) (4 marks)

iii) FWA (fixed wireless Access) (4 marks)

QUESTION TWO

a) What is the main purpose of having a security policy? (4 marks)

b) Describe how the following threats give rise to security concerns

i) Viruses (3 marks)

ii) Hacking (3 marks)

iii) Employee sabotage (3 marks)

iv) Denial of service attack (3 marks)

c) Identify and describe two design policies that are used when implementing firewalls (4 marks)

QUESTION THREE

a) Identify and give a brief description of four supplementary services offered by GSM that support and complement voice and data services (8 marks)

b) What is the function of a GSM interworking unit (GIWU) (3 marks)

c) The GSM network is divided into three major systems. Identify and describe the operation of these three systems (9 marks)

QUESTION FOUR

a) An IP network that has not been designed in a systematic fashion will invariably run into problems from the beginning of the implementation stage. Describe how the following design considerations assist in producing a good network design.

i) Scalability — measurement (2 marks)

ii) Open Standards — responsible for full communication (2 marks)

iii) Availability/Reliability — always present and reliable (2 marks)

iv) Modularity (2 marks)

b) Designing a network is more than merely planning to use the latest gadget in the market. A good network design takes into consideration many factors. Outline two factors that affect the design of a network. (8marks)

c) Give a description of SNMP (4 marks)

QUESTION FIVE

a) Explain the following principles in relation to network connection devices

i) 5-4-3 rule (3 marks)

ii) 80/20 rule (3 marks)

iii) Distributed spanning tree algorithm (3 marks)

b) What is the importance of the following devices in networking?

i) Switch (8 marks)

ii) Router (3 marks)

c) Explain the operation of NAT

QUESTION SIX

a) Wireless stations can be interconnected in a peer-to-peer network or Independent Basic Service Set (IBSS). Describe how an IBSS network operates (5 marks)

b) Describe the following Ethernet access methods
   i) CSMA/CD (6 marks)
   ii) CSMA/CA

c) Compare and contrast the following Wireless network terms
   i) Omni-directional and Highly-Directional antenna (4 marks)
   ii) WEP and WPA (5 marks)

QUESTION SEVEN

a) Identify and describe three main types of VPNs (9 marks)

b) Describe in outline the three advantages of VPNs (3 marks)

c) List the functions of a VPN gateway (4 marks)

d) A number of challenges arise when changing from a circuit-switched voice network to a packet-switched voice network. Describe in outline the four challenges of a packet switched voice network (4marks)