INSTRUCTIONS:

1. Answer Question 1 (Compulsory) and ANY other two questions
2. Candidates are advised not to write on the question paper
3. Candidates must hand in their answer booklets to the invigilator while in the examination room
A) QUESTION 1 [30 MARKS]
b) Why does fiber optic media have a significant security advantage over other transmission Media (2 marks)
c) What do you understand by the term subnetting? (2 mark)
d) What do you understand by term convergence in relation to network design? (2 marks)
e) What do you understand by NAT, what are the two important functions it provides on a network (3 marks)
f) What is a demilitarized zone what essence does it serve in a network environment (2 mark)
g) What is a Non-routable address? (2 marks)
h) Explain what you understand by Automatic Private IP Addressing (APIPA) (2 marks)
i) Why are WAN generally slower than LAN`s (2 mark)
j) You have been asked to install a network to give the network users the greatest amount of fault tolerance. Which network topology would you choose and why? (2 mark)
k) The IP address provides two pieces of information explain. (2 marks)
l) State threes reason why you would use DHCP over static addressing (3 marks)
m) Convert the following into binary 234 and 1092 (do not use a calculator) (4 marks)
n) What is the difference between connection oriented and connectionless protocol (2 marks)

QUESTION 2 [20 MARKS]
a) What is the 127.0.0.1 address used for? (2 marks)
b) What effect will an inappropriate DHCP server have on hosts using static IP addresses? (2 marks)
c) What predecessor to DHCP, on which DHCP is based, was used to assign a workstation its IP information and to supply it with a boot image? (2 marks)
d) What is the class C range of values for the first octet in decimal and in binary?
   \[2\text{marks}\]

e) What is the valid range of values that may appear in an IPv4 octet? Give your
   answer in decimal as well as binary
   \[2\text{marks}\]

f) What is the term for the auto-configuration technology responsible for
   addresses that start with 169.254?
   \[2\text{marks}\]

g) What advantages are associated with network segmentation?
   \[4\text{marks}\]

h) What is the primary function of a bridge?
   \[2\text{marks}\]

i) What advantage does a switch have over a hub?
   \[2\text{marks}\]

QUESTION 3 [20 MARKS]

a) State the several instances as to when a switch would be forced to broadcast
   \[5\text{marks}\]

b) When a bridge is introduced in a network of a hub what happens to the collision domain
   using a diagram explain
   \[4\text{marks}\]

c) Explain why a switch is considered an intelligent device
   \[1\text{mark}\]

d) You have a network of 48 computers connected to a central hub of late network has
   been terribly explain how you would go about to solve this problem with the aid of a
   diagram
   \[10\text{marks}\]

QUESTION 4 [20 MARKS]

a) Explain what you understand by the two these two secure network technologies NAC
   and PAT
   \[2\text{marks}\]

b) Explain the effect on collision domain on following scenarios
   \[6\text{marks}\]
   i. A bridge introduced between two hubs
   ii. Two computers added on a hub network
   iii. A network of a single hub with ten computers broken into two halves by
       introducing a second hub connected to the first hub

c) Distinguish between guided and unguided medium
   \[4\text{marks}\]

d) Access Point is limited by a transmission range support your answer with at least
   two factors
   \[2\text{marks}\]
e) Examine the diagram shown here. What is the most likely reason that user Spencer cannot communicate with user Evan? (2mark)

![Diagram showing IP addresses and subnet masks]

User: Evan
- IP address: 192.168.1.121
- Subnet mask: 255.255.255.0
- Default gateway: 192.168.1.1

User: Spencer
- IP address: 192.168.1.127
- Subnet mask: 255.255.255.0
- Default gateway: 192.168.1.1

f) distinguish between public and private IP (4marks)

QUESTION 5 [20 MARKS]

a) State and briefly explain at least 5 advantages associated with subnetting as a way of securing a network infrastructure (5marks)

b) State at least six advantages associated with convergence (6 marks)

c) Briefly explain at least 5 convergence vulnerabilities especially in relation to VOIP (5 marks)

d) By the use of a diagram explain how Network Address Translation Works (4marks)