Revision

Section A: Highlight the correct answer of the MCQs in Yellow. Each MCQ carries one mark.

1. What is the bandwidth of gigabit ethernet?
    a. 100Mbps
    b. 1Gbps
    c. 200Mbps
    d. None of the above
2. What is correct about computer networks?
    a. Latency has to be the highest to have fast transactions over the network
    b. Optical fibers are a type of wireless media
    c. In a walkie talky we can see half duplex type of data transmission
    d. A network between two cities is a large LAN
3. Select the correct answer
    a. Physical layer is responsible to carry out raw data transmission over transmission media
    b. Data link layer works with logical addresses
    c. Transport layer does IP addressing
    d. UDP and TCP are protocols used in data link layer
4. Which one is wrong about an IP address
    a. IPV4 has 32 bits
    b. IPV6 has 128 bits
    c. 111.56.045.78 is a correct IP address
    d. IPV4 has four octets separated by dots

5. What is the correct definition of the stated registers?
    a. Pointer registers transmits data back and forth from internal memory
    b. General purpose registers stores segments of memory addresses
    c. Registers provide quick access to commonly used programs
    d. Flag registers are not programmable
6. Calculate the memory requirement for SVGA card. Resolution is 800*600 and Color depth is 24bits
    a. 480,000 bytes
    b. 469 kB
    c. 480 kB
    d. 1152 kB

Section B: Type all the answers.

1.

a. Why do we usually limit a Peer-to-peer network to have only 10 computers? (3 marks)

Due to the lack of central control; the peer-to-peer network is very complicated when it comes to trouble shooting(finding out which computer is causing trouble). Hence; we tend to limit it to a smaller number of computers.

b. "Switch is an intelligent device compared to a Hub" briefly explain this sentence. (2 marks)

Switch has the ability to send the data to the exact intended computer on the network. It also has the ability to detect the path with least amount of network traffic.

2.

a. What is the main functionality of a computer motherboard? (2 marks)

The motherboard acts as the central backbone of a computer on which other modular parts are installed such as the CPU, RAM and hard disks.

b. What is RAM used for? (2 marks)

To store data and instructions that should be processed.
CPU can randomly access any memory location and read and write to them.

c. What is an expansion slot? (1 mark) Provide one example of an adaptor card and write its usage (2marks)

A socket on the motherboard that is used to insert an expansion card (or circuit board), which provides additional features to a computer such as video, sound, advanced graphics, Ethernet or memory.

Eg:
Video card - generates a feed of output images to a display device, such as a computer monitor.
Network card - works on connecting the computer and the network.
Sound card – provides the audio component for multimedia applications

d. Write down three features of the Von Neumann architecture (3 marks)

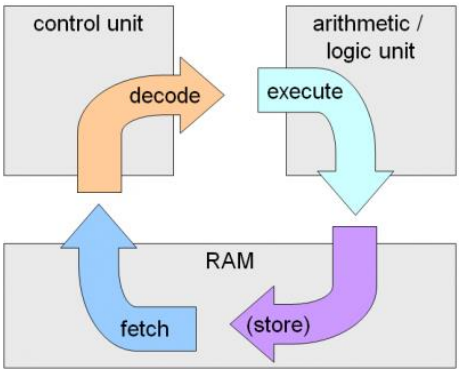
- The Von Neumann architecture is a theoretical design based on the stored-program computer concept.
- This has only one bus that is used for both instructions fetches and data transfers. The operation must be scheduled because they cannot be performed at the same time.

- Processing unit would require two clock cycles(Fetch execute cycles) to complete an instruction.
- In Von Neumann, instructions and data use the same bus system therefore the design and development of control unit is simplified, hence the cost of production becomes minimum.

e. Write the functionality of the following busses: (6 marks)

i. Data bus – Carries data that need to be processed
ii. Address bus – Determines where data should be sent
iii. Control bus – What should be done with the data in the selected memory location

f. Briefly explain the machine cycle of a computer (4 marks)



Fetch - retrieve instructions from HDD and store in a temporary location (Registers)
Decode - decides what should be done to the fetched information
Execute - actual data processing takes place here
Store

3.

a. Briefly explain loss less and lossy data compression and give one example each (5 marks)

Lossless compression reduces bits by identifying and eliminating statistical redundancy. (Statistical redundancy is the amount of space wasted for certain bits to be stored.) No information is lost in lossless compression.
Eg: PNG, BMP and GIF

Lossy compression reduces bits by removing unnecessary or less important information. The quality is reduced.
Eg: JPEG

b. Compare Raster graphics and Vector graphics. (8)

Raster graphics	**Vector graphics**
Composed of pixels (bitmaps)	Composed of paths

Graphic primitives are specified in terms of end point and must be can converted into corresponding pixels.	Scan conversion is not required.
Raster refresh process is independent of the complexity of the image.	Vector displays flicker when the number of primitives in the image become too large.
Occupy more space based on the image quality.	Occupy less space.
File extensions: .BMP, .TIF, .GIF, .JPG	File extensions: .SVG, .EPS, .PDF, .AI, .DXF

c. Briefly explain Direct representation and Palette based representation. (6)

Direct representation - The number used to represent pixel data is composed of 3 numbers, one for each RGB colour. 24 bit colour depth consists of three 8-bit (1 byte) values representing RGB colour combinations.
Eg: White color - rgb(255, 255, 255)

Color information is not directly carried by the image pixel data, but is stored in a separate piece of data called a palette: an array of color elements. Every element in the array represents a color, indexed by its position within the array. The image pixels do not contain the full specification of its color, but only its index in the palette.