

This paper consists of **two** parts as **A** and **B**.

Part A - Four structured essay type questions.

All questions should be answered. 10 marks for each question - Total 40 marks

Part B - Six essay type questions.

Four questions should be answered. Each question carries 15 marks - Total 60 marks.

Part A

1. The "ABC Company" is a small scale company which sells furniture. The management in the company plans to implement a small network within its building. They came across two choices of communication media: "coaxial cables" and "fiber optics".
 - i. Differentiate these two Medias in terms of "Data Speed", and "Flexibility" (2 Marks)
 - ii. Write Two Advantages of having a computer network (2 Marks)
 - iii. Write Two Disadvantages of having a computer network (2 Marks)
 - iv. Write down Four network topologies and draw the structure of each (2 Marks)
 - v. Define the term "Computer Network" (1 Marks)
 - vi. Explain the terms Simplex and Duplex (1 Marks)

2. Operating systems have come a long way from the primitive punched-card based systems of the 1960s to today's operating systems like Windows 7™ or Mac OS X™.
 - i. Give a brief account of the history of the operating system and indicate some of the key developments in its history. (2 marks)
 - ii. Explain the role and functionality of the operating system in a modern high performance personal computer or work station. (5 marks)
 - iii. Briefly state how you think that operating systems might develop in the next decade? (3 marks)

3. A circuit has four natural binary encoded inputs D, C, B, A where D is the most-significant bit. These values represent 0 to 15 in decimal. It has a single output X. A designer wishes to construct a logic circuit using AND, OR, and NOT gates that will provide a 1 output if the input on D, C, B, A is either less than four or in the range 10 to 12 inclusive.
 - i. Construct a truth table with four inputs, D, C, B, A in the range 0 0 0 0 to 1 1 1 1 and an output X. (2 marks)
 - ii. Using Boolean algebra write down an expression (unsimplified) for X. (2 marks)
 - iii. By means of Boolean algebra or a Karnaugh map write down a simplified Boolean expression for X. (3 marks)
 - iv. Draw a circuit using AND, OR, and NOT gates to implement the simplified Boolean expression for X. (3 marks)

4. The combination of data transmission and personal computing has made it possible for very large numbers of people to use computers at home and at work to access their personal and professional data files, to exchange data, and to run complex applications and games. However, such computer power has been abused by those who create malware programs like viruses and worms that attack computers. Describe the range of malware (its operation and dangers) that poses a threat to computer users and explain what the computer user can do to avoid the harmful effects of such malware. Your answer should include a discussion of the role of the firewall in networked systems. (30 marks)

Part B

1. a) Describe the factors that need to be considered as to whether to use a laser or an ink jet printer. (8 marks)
b) Explain the operation of a laser printer. (7 marks)
2. Wireless computing (Wi-Fi) has changed the way people use computers and associated devices.
a) Using Wi-Fi as an example, describe how wireless computing operates. (7 marks)
b) Give four examples of typical devices that make use of Wi-Fi (8 marks)
3. a) Explain the importance of IP addressing in computer networks. (7 marks)
b) What are the differences between an intranet and an extranet? (8 marks)
4. a) Explain the function of a web browser. (7 marks)
b) What are the differences between HTML and HTTP? (8 marks)
5. Perform the following operations.
a) Convert the following numbers to twos complement and find their difference using twos complement arithmetic: 125, -34. (5 marks)
b) 010001 AND 101010 (2 marks)
c) 100110 XOR 110011 (3 marks)
d) Write the following hexadecimal number as a binary number: ABDE (5 marks)
6. a) What is the difference between HTML and XHTML , explain using examples (5 marks)
b) What is the purpose of using CSS with HTML for web designing? (5 marks)
c) Provide code examples for Inline, Internal and External CSS (5 marks)