1. (i) Explain the following computer terms giving examples where necessary:
   (a) Video conferencing
   (b) Stock control system
   (c) E-Learning (6 marks)

   (ii) (a) Explain one stage of the machine instruction cycle that takes place in the ALU of the CPU. (2 marks)
   (b) Sketch the logic circuit for the logic expression $(p\ AND\ q) OR \overline{(p\ AND\ q)}$. (3 marks)

   (iii) (a) What is software reuse with respect to system development? (2 marks)
   (b) State two criteria used to select existing software for reuse. (2 marks)
   (c) Explain two situations that may cause organizations to engage in externally developed (outsourcing) software. (2 marks)

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2. (i) (a) Explain the main difference between the peer-to-peer and the client/server networks. (3 marks)
   (b) Give two disadvantages of the client/server network. (2 marks)

   (ii) (a) What is an Information System? (2 marks)
   (b) Explain the term "procedure" as a component of an information system. (1 mark)
   (c) In terms of information system describe GIS and LIS. (4 marks)

   (iii) (a) What is the main difference between a high level language (HLL) and a low level language (LLL)? (2 marks)
   (b) Explain what is meant by machine dependent.
   Which of these languages is machine dependent: HLL or LLL? (2 marks)
   (c) Give one example of HLL. (1 mark)

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3. (i) (a) What is SDLC? (1 mark)
   (b) Give two advantages of direct system implementation method. (2 marks)
   (c) State three activities involved in the design stage of SDLC. (3 marks)

   (ii) (a) What is the role of a system analyst in an organization? (2 marks)
   (b) Describe two ways by which a system analyst can get information about a system to be developed. (3 marks)

   (iii) Discuss with examples three changes in the workplace due to the increased use of ICT.
   Your answer should refer to the changes for the employees. (6 marks)

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4. (i) (a) What is an operating system? (2 marks)
   (b) Explain the role played by the operating system in the given instances
   - Integrating additional hardware to a computer system
   - Managing RAM usage during processing (4 marks)

   (ii) (a) What is a computer interface? (1 mark)
   (b) Give the characteristic of the Graphical User Interface. (2 marks)
   (c) State two advantages of GUI over Command Line. (2 marks)

   (iii) Explain the effect and the consequences on computer system in the absence of each of the following:
   (a) RAM
   (b) Buffers
   (c) NIC (3 marks)

   (iv) (a) What is memory? (1 marks)
   (b) Describe the purpose of ROM in the computer system. (2 marks)

5. (i) Structured programming refers to a general methodology of writing good programs.
   (a) What is programming? (1 mark)
   (b) Give 4 properties of a good program. (4 marks)

   (ii) Describe briefly the following:
   (a) Application software (2 marks)
   (b) Virtual reality (2 marks)
   (c) Biometrics (2 marks)

   (iii) Give three advantages of simulation. (3 marks)

   (iv) Write the full meaning of each of the following abbreviations?
   (a) ASCII (1 mark)
   (b) PAN network (1 mark)
   (c) EPROM (1 mark)

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6. (i) It is usually necessary to compare different implementations of an algorithm to choose an optimal one. This can be done by considering their relative efficiencies.
   (a) What is efficiency with respect to algorithm performance (1mark)
   (b) Which own basic resources of a computer can be used to measure the efficiency of an algorithm? (2 marks)

   (ii) (a) Describe simulation and a situation that can be simulated. (3 marks)
   (b) Give three advantages of simulation to architects. (3 marks)

   (iii) Work generally could be classified into operations or project. Although in some cases, they do overlap.
   (a) Give any two characteristics common to operations and project. (2 marks)
   (b) Make a difference between operations and project. (2 marks)

   (iv) In a multiprogramming and time sharing environment, several users share the same system simultaneously. This situation can result to various security problems.
   (a) What are two such security problems? (2 marks)
   (b) Is it possible to ensure the same degree of security in a time-shared machine as in a dedicated machine? Explain your answer. (2 marks)

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7. (i) During the late 1960s and 1970s, there had been an outcry over impending "software crisis". The symptoms of such software crises still exist in present day. List 4 symptoms of software crises. (4 marks)

   (ii) Explain the following terms:
   (a) Parity bit (2 marks)
   (b) ARPANET (2 marks)
   (c) Internet standard (2 marks)

   (iii) (a) What is prototyping? (2 marks)
   (b) List three benefits of prototyping. (3 marks)

   (iv) Given that a disk has 18 sectors, 80 tracks and a sector capacity of 512 bytes. Prove that the storage capacity of the disk is 1.44 MB. (2 marks)

8. (i) Explain briefly the meaning of each of the following terms giving examples where necessary

(a) Automatic Speech recognition (ASR) (3 marks)
(b) HTML (2 marks)
(c) Artificial Intelligence (AI) (3 marks)
(d) Internet (3 marks)
(e) VHS (3 marks)

(ii) (a) Explain the meaning of the term "Data Security". (1 marks)
(b) Describe how encryption will help to protect information or a message which is sent across a network. (2 marks)

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9. (i) Define the following terms of online Internet services giving TWO advantages and ONE disadvantage in each.

(a) E-Commerce (3 marks)
(b) E-Banking (3 marks)
(c) E-Health (3 marks)

(ii) (a) What is a social network? (2 marks)
(b) Outline TWO advantages and ONT limitation of social networking. (3 marks)

(iii) Explain the following errors that can arise during programming:
(a) syntax errors
(b) run-time errors
(c) logic errors (3 marks)
