University of Kelaniya – Sri Lanka

Centre for Distance & Continuing Education

Bachelor of Science (General) External
First year First semester examination - 2019
(New Syllabus)
2022 August
Faculty of Science

COSC 16512 / COST 16512 – Introduction to Computing

Name:.. Student No:.................................

This paper consists of TWO PARTS.   Time: **Two (02) hours**

PART I : No of Questions: Four (04)   Total No of pages: **Seven (07)**
PART II: No of Questions: Thirty (20)

Answer ANY THREE (03) questions in PART I.
Answer ALL Questions in PART II in the provided space.

PART I

1.
   (a) Convert the following numbers to the numbers in the given base.
   - (i) 75.375_{10} to binary
   - (ii) 562.45_8 to decimal
   - (iii) 11010011.10111_2 to octal
   - (iv) $6AB.C4F_{16}$ to decimal
   - (v) $2D4E.8C_{16}$ to binary

   (b) Is it possible to use the "binary addition algorithm" with the sign-magnitude representation? Justify your answer using examples.

   (c) Evaluate the following expressions using 8-bit representation and two's complement representation.
   - (i)   -4 - 5
   - (ii)   53-26
   - (iii) 17-38

(d) Assume that the eighth bit of the code is referred to as the Parity Bit. If a sender wants to send the 7-bit value 111 1101, then what would be the eight-bit value it sends using the following two parity schemes. Justify your answers.
   (i)   even parity
   (ii) odd parity

(e) The IEEE standard single-precision (32 bits) floating-point format is shown in the following figure.

1 bit	8 bits	23 bits
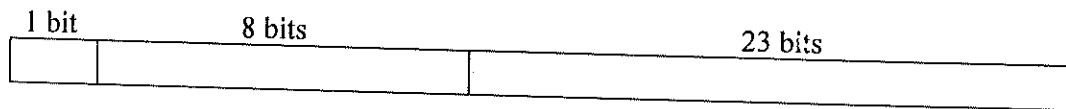
What is the IEEE single-precision floating point representation of the decimal number -15.875?

2.
   (a) What is the difference between the ASCII and Unicode character sets?

   (b) (i)   What is Bitmap Graphic method of image representation?

       (ii) Briefly explain the following Bitmap Graphic methods.

             1. Bitmap Graphic for Black and White images

             2. Bitmap Graphic for Grayscale images

             3. Bitmap Graphic for Coloured images

       (iii) Give two advantages of Vector Graphic method over Bitmap Graphic method.

   (c) List the processing steps of converting sound analog signal into digital signal.

   (d) What are the types of operating systems? Briefly explain two (2) of them.

   (e) What are the four (4) major functions of an Operating System (OS)?

   (f) Compare and contrast Command Line Interface (CLI) and Graphical User Interface (GUI).

3.
   (a) (i)   What are the two types of machine sub-cycles?

       (ii) What are the five (5) factors affecting to the processing speed? Explain how they affect to the processing speed.

       (iii) Briefly explain the differences between CISC and RISC processors.

   (b) What is a Computer Program?

   (c) Compare and contrast structured programming and object-oriented programming.

   (d) What is the major difference between Compilation and Interpretation.

   (e) (i)   What is a flowchart?

(ii) Draw flowcharts for the following scenarios.

      1. Read a mark of a student, if the mark is less than 40, print the message 'Fail' otherwise print the message 'Pass'.

      2. Read three numbers. Find the largest among them.

4.

  (a) (i)   What is a 'computer network'?

       (ii)   List four (4) main benefits of using a computer network and briefly describe any two of them.

  (b) What are the components of a data packet?

  (c) Describe the major difference between the functions of a switch and a router in a computer network.

  (d) (i)   What is a Peer-to-Peer (P2P) network?

       (ii)   List two (2) advantages of P2P networks.

  (e) Give three (3) examples for guided transmission media and briefly describe them.

  (f) (i)   Briefly explain two (2) major features of the Internet.

       (iii) What are the protocols used by World Wide Web (WWW) and E-mail respectively.

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PART II

1. List the four (4) main components of a complete computer system.

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2. What are the four (4) main steps of the information processing cycle?

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3. What is the difference between 'System software' and 'Application software'?

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4. What is the difference between Data and Information?

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5. State three (3) advantages of the second generation computers over the first generation computers.

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6. List two types of optical input devices and describe their usage.

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7. List three (3) advantages of Active Matrix LCD over Passive Matrix LCD.

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8. What is the main difference between a mainframe computer and a supercomputer?

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9. What is meant by the refresh rate of a monitor?

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10. What are the disadvantages of impact printers over non-impact printer?

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11. What is the problem of Limited Viewing Angle in computer monitors?

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12. What are the types of the mouse?

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13. List the four criteria that can be used to evaluate printers.

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14. List three types of networks.

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15. What is TCP/IP protocol?

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16. What is the use of DNS Address?

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17. What is the need of using expansion slots?

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18. Why would an 'IP address' given to a computer?

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19. Name the parts of a URL by providing an example.

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20. Why do the computers use binary (base-2) number system, instead of the conventional decimal (base-10) number system?

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