POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS (PGDCA-NEW)

Term-End Examination

June, 2024

MCS-202 : COMPUTER ORGANISATION

Time : 3 Hours   *Maximum Marks : 100*

Weightage : 70%

Note : *Question No. **1** is compulsory and carries 40 marks. Attempt any **three** questions from the remaining Question No. **2** to Question No. **5**.*

1. (a) Explain Harvard architecture with the help of a diagram. 5

(b) Perform the following conversions :   5

   (i)   Decimal $(873)_{10}$ to Binary

   (ii) Decimal $(384)_{10}$ to Hexadecimal

   (iii) Hexadecimal $(FAB)_h$ to Octal

   (iv) ASCII string 'the escape sequence' to UTF8

   (v)   Octal $(765)_8$ to Decimal

(c) Differentiate between CLV and CAV type of disk organizations.   5

(d) Explain two-way set associative Cache mapping with a suitable example.   5

(e) Differentiate between RISC processor and CISC processor. Give utility of each.   5

(f) What is an interrupt ? Explain the use of interrupt in input/output with the help of an example.   5

(g) List the various register categories involved with 8086 microprocessor. Also, give the role of each type of register category.   5

(h) Compare direct addressing mode and indirect addressing mode. Give example for each.   5

2. (a) Simplify the function :

$$F(A, B, C) = \Sigma (2, 3, 4, 5)$$

using k-map. Also, draw the circuit using NAND gates.   5

(b) Explain the functioning of 2×4 decoder. Draw its truth table and explain its logic diagram with the help of example input.   8

(c) Explain the working of SR flip-flop with the help of a logic diagram and characteristic table. Also, explain the excitation table of SR flip-flop.   7

3. (a) Explain the concept of programmed I/O. How is Direct Memory Access (DMA) technique differ from programmed I/O technique ? Under what situation is it better to use DMA over programmed I/O ?

8

(b) Define disk access time. Write the equation to compute disk access time. Also, discuss the meaning of all the parameters involved in the computation of disk access time. 7

(c) What are Charge-Coupled Devices (CCDs) ? Briefly discuss the utility of CCDs. 5

4. (a) Explain the following addressing modes, with the help of a suitable diagram (showing content of sample memory and registers) : 10

(i) Register Indirect Addressing

(ii) Relative Addressing

Note : Your diagram should include instructions, operands and addresses.

(b) What is a micro-operation ? Explain register transfer micro-operation with a suitable example. 5

(c) Write a program in 8086 assembly language, which converts a two digit ASCII number to a packed BCD number. Explain each step of the program. 5

5. Write short notes on the following : 5×4=20

   (i) Cache coherence

   (ii) Parallelism in uniprocessor systems

   (iii) .Com programs and .Exe programs

   (iv) Wilkes control