

No. of Printed Pages : 4

**MCS-202**

**POST GRADUATE DIPLOMA IN  
COMPUTER APPLICATIONS  
(PGDCA-NEW)**

**Term-End Examination**

**December, 2021**

**MCS-202 : COMPUTER ORGANISATION**

*Time : 3 Hours*

*Maximum Marks : 100*

*Weightage : 70%*

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

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1. (a) Perform the following operations using signed 2's complement notation of 8 bits (including sign bit). Also indicate overflow, if any : 6
- (i) Add – 28 and +127
- (ii) Subtract – 56 from – 77
- (iii) Add + 28 and + 100

- (b) Simplify the following function using K-map : 5

$$F(A, B, C, D) = \Sigma (0, 3, 5, 7, 9,$$

10, 11, 12, 15)

and draw the logic circuit of the function so obtained.

- (c) What is the purpose of using cache memory in a computer ? Explain the need of cache mapping scheme. 4
- (d) What is the importance of DMA ? Explain its functioning. 5
- (e) How is the instruction of a computer different from C language instruction ? Explain various components of a computer instruction. 5
- (f) Explain the working of micro-programmed control unit. 5
- (g) Explain the components of 8086 micro-processor with the help of a diagram. 5
- (h) Write a program using 8086 assembly language that converts a binary value stored in a byte location (assume the value in between 0 and 9) to equivalent ASCII digit. 5
2. (a) Perform the following conversions : 5
- (i)  $(389)_{10}$  to hexadecimal

- (ii)  $(FFA)_{16}$  to octal
- (iii)  $(2357)_8$  to hexadecimal
- (iv)  $(AAA)_{16}$  to decimal
- (v)  $(235)_8$  to decimal
- (b) Draw the block diagram and characteristic table of S-R flip-flop. Make the excitation table from characteristic table of this flip-flop. 5
- (c) What is a Master-Slave flip-flop ? Explain its working with the help of a diagram. 5
- (d) Differentiate between Von Neumann and Harvard architecture. 5
3. (a) Why is memory hierarchy created in a computer system ? Explain memory hierarchy with the help of a diagram. 6
- (b) Explain the use of interrupt in input/output operation with the help of an example. 6
- (c) Why do you need input/output devices ? Explain the functioning of any *one* output device. 5
- (d) Explain the term access time in the context of a hard disk. 3

4. (a) Explain any *four* addressing modes of a computer with the help of an example of each. 8
- (b) What are the advantages of RISC architecture ? Explain the uses of large register file which may be found in RISC with the help of a diagram. 4
- (c) Give an example of arithmetic micro-operation and *one* example of logic micro-operations. 4
5. (a) Explain any *four* instructions of 8086 microprocessor. 8
- (b) Explain the following with the help of a diagram/example : 12
- (i) Instruction pipeline
- (ii) Multiprocessor
- (iii) Full adder