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MCS–012

MASTER OF COMPUTER APPLICATIONS (REVISED)/BACHELOR OF COMPUTER APPLICATIONS (REVISED) (BCA/MCA)

Term-End Examination

December, 2023

MCS-012 : COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING

Time : 3 Hours *Maximum Marks : 100*

Note : *Question No.* ***1*** *is compulsory and carries* **40** *marks. Attempt any* ***three*** *questions from the rest.*

1. (a) Convert the following decimal numbers to binary and hexadecimal : 6

   (i) $(28)_{10}$

   (ii) $(256)_{10}$

   (iii) $(42.25)_{10}$

(b) What is half-adder ? Make the truth table and logic diagram of a half-adder. 4

(c) Explain the purpose of RAID. Explain the features of any *two* levels of RAID. 5

(d) Explain the interrupt driven I/O technique with the help of a diagram. 5

(e) Explain the subroutine call and return instructions of a computer system with the help of an example. 5

(f) Explain the concept of instruction pipelining with the help of a diagram. 5

(g) What are different segment registers in 8086 microprocessor ? Explain the use of each of these registers with the help of an example. 5

(h) What is interrupt INT 21 h in 8086 microprocessor ? Explain its use with the help of an example. 5

2. (a) Simplify the following Boolean functions in SOP and POS forms using K-map. Also draw the logic diagrams : 10

$F(A, B, C, D) = \Sigma (0, 2, 8, 9, 10, 11, 14, 15)$

(b) What is the need of Cache memory ? Explain the direct mapping cache organisation and associative mapping cache organisation with the help of a diagram. 10

3. (a) Write a program using 8086 assembly language that exchanges the byte values given in two memory locations. 8

(b) Explain the Wilkes control unit with the help of a diagram. 6

(c) Explain the Master-Slave flip-flop with the help of a diagram. 6

4. (a) Describe the following I-O techniques in detail : 10

(i) Programmed I/O

(ii) Direct memory access

(b) Discuss any *five* addressing schemes with the help of ***one*** example of each. 10

5. (a) Explain the RISC architecture in detail. 5

(b) Write short notes on the following : 5×2=10

(i) COM and EXE programs

(ii) Decoder and Encoder

(c) Explain the control memory organization with the help of a diagram. 5