BACHELOR OF SCIENCE (COMPUTER SCIENCE) (CBCS - 2016 COURSE)
S.Y.B.Sc.(Computer Science) Sem-III : WINTER- 2022
SUBJECT : DIGITAL SYSTEMS & MICROPROCESSORS

Day : Thursday

Time : 10:00 AM-01:00 PM

Date : 15-12-2022   **W-14884-2022**   Max. Marks : 60

N.B

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat diagrams **WHEREVER** necessary.
4) Use of scientific calculator is **ALLOWED**.

Q.1   Answer any **TWO** of the following: **(12)**

   a) Explain the following addressing modes with one example each: i) Direct ii) Register ii) Immediate

   b) Draw and explain the functional block diagram of DMA controller.

   c) Explain the successive approximation method for ADC with necessary diagram.

Q.2   Answer any **TWO** of the following: **(12)**

   a) What is stack? Explain stack organization with PUSH and POP instructions.

   b) Explain the flag register for Pentium with bit diagram.

   c) Explain synchronous and asynchronous data transfer in detail.

Q.3   Answer any **TWO** of the following: **(12)**

   a) What is cache memory? Explain the structure and design of cache memory.

   b) Draw block diagram of 8086 microprocessor. Explain BIU and EU.

   c) Explain Von Neumann and Harvard architectures in brief.

Q.4   Answer any **THREE** of the following: **(12)**

   a) What is virtual memory? Explain segmentation system of it.

   b) Define the following terms for memory: i) Speed ii) Access time ii) Capacity

   c) Explain any two logical instructions with one example each.

   d) Calculate the average access time and efficiency of the system whose parameters are $t_{AC} = 100$ ns, $t_{AM} = 1000$ ns and $h = 90\%$

Q.5   Answer any **FOUR** of the following: **(12)**

   a) Explain the concept of three level memory hierarchy.

   b) Draw the control word format of PPI.

   c) Explain any three parameters of DAC.

   d) Explain the following instructions: i) CMP EAX, EBX ii) INC EBX iii) ADD EBX, EAX

   e) Draw well labelled diagram of UART.

   f) Explain the instruction format.

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