

BACHELOR OF SCIENCE (COMPUTER SCIENCE) (CBCS - 2018 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-20095-2022

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**.
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- Q.1** Answer any **TWO** of the following: **(12)**
- a) Explain the following addressing modes with one example each: i) Direct ii) Register iii) 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 iii) 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 $t_{AC} = 100 \text{ ns}$, $t_{AM} = 1000 \text{ ns}$ 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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