

BACHELOR OF SCIENCE (COMPUTER SCIENCE) (CBCS - 2018 COURSE)
S.Y.B.Sc.(Computer Science) Sem-III : WINTER :- 2021
SUBJECT: DIGITAL SYSTEMS & MICROPROCESSORS

Day : Friday
Date 28-01-2022

W-20095-2021

Time : 10:00 AM-01:00 PM
Max. Marks: 60

N.B.:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Draw diagrams **WHEREVER** necessary.
 - 4) Use of **CALCULATOR** and log table is allowed.
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Q.1 Answer **ANY TWO** of the following: (12)

- a) Explain asynchronous and synchronous serial data transfer.
- b) Explain DMA data transfer with the help of neat diagram.
- c) Draw appropriate diagram for successive approximation type ADC and explain its working.

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

- a) Explain associative memory with necessary diagram.
- b) Draw block diagram of UART and explain its different blocks.
- c) Explain any three addressing modes of Pentium processor with one example of each.

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

- a) What is an interface? Explain the major functions of I/O processes.
- b) Draw neat diagram of Execution unit of 8086 microprocessor. Explain the functions of stack pointer, ALU and flags.
- c) Define hit ratio for cache memory. If the cache memory access time is 100ns and main memory access time is 1000ns, what is the average access time, γ and efficiency of the system if hit ratio is 90%?

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

- a) Explain the general register organization in Pentium microprocessors.
- b) Explain interrupt initiated transfer.
- c) Explain any four parameters of DAC.
- d) Explain the function of flag register of 8086 microprocessor.

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

- a) State three points of difference between Harvard and Von Neumann architecture.
- b) A 4-bit R-2R ladder network works with $0 = 0V$ and $1 = 16V$ Find:
 - i) Full scale output voltage
 - ii) Analog output for digital input 1001
 - iii) Analog output due to LSB change.
- c) Explain the PUSH and POP instructions related to stack operations.
- d) Define the following terms for memory:
 - i) Access time
 - ii) Speed
 - iii) Capacity
- e) Explain the concept of address bus, data bus and control bus in case of microprocessors.
- f) Explain three level memory hierarchy.