

Total No. of Questions : 5]

SEAT No. :

**PA-1007**

[Total No. of Pages : 2

[5902]-26

**F.Y. B.Sc. (Computer Science)**

**ELECTRONIC SCIENCE**

**ELC - 122 : Basics of Computer Organisation  
(2019 Pattern) (CBCS) (Semester - II) (Paper - II)**

*Time : 2 Hours ]*

*[Max. Marks : 35*

*Instructions to the candidates:*

- 1) *Question 1 is compulsory.*
- 2) *Solve any three questions from Q.2 to Q.5.*
- 3) *Figures to the right indicate full marks.*
- 4) *Draw neat diagrams wherever necessary.*

**Q1)** Solve any five of the following.

**[5×1=5]**

- a) Draw symbol of 'D' FF (Flip-Flop)?
- b) State any two applications of shift registers?
- c) In computer organisation. What is the significance of control bus?
- d) Why program counter register is used inside of microprocessor?
- e) How many address lines will be used to construct 4 MB of memory locations?
- f) What is the full form of 'ALU' and what is it's role in microprocessor.

**Q2)** a) Solve any two of following.

**[2×3=6]**

- i) Explain with neat diagram 3 bit PIPO shift register.
- ii) Discuss the concept of J.K.FF (Flip-Flop) with Logic circuit diagram and truth table.
- iii) Design 1K×16 memory capacity using 1K×4 memory chip integrated circuits.

b) Draw and explain CPU (Central Processing Unit) block diagram in detail.

**[1×4=4]**

**P.T.O.**

- Q3) a)** Attempt any two of the following: **[2×3=6]**
- i) What is Ring counter, draw and explain it.
  - ii) Explain concept of stack organisation.
  - iii) The number of references made by CPU to memory (Cache) are 100 and 90 times data was present in Cache memory. How much will be the cache hit ratio and cache miss ratio.
- b) Draw and explain 3 bit down counter. **[1×4=4]**

- Q4) a)** Answer any two of the following: **[2×3=6]**
- i) Explain concept of 'T' Flip Flop in detail.
  - ii) What is the importance of I/O interface, discuss details.
  - iii) Write differences between synchronous and asynchronous counter. (any three differences)
- b) Discuss in detail four (4) level memory hierarchy. **[1×4=4]**

- Q5) Answer any four of the following:** **[4×2.5=10]**
- a) Explain how RS Flip flop can be converted into 'D' Flip Flop.
  - b) Draw logic circuit diagram of 3 bits combinational Up - Down counter.
  - c) Explain importance and working of cache memory in based computer organisation.
  - d) Draw logic diagram of register based CPU organisation.
  - e) Explain concept of virtual memory.
  - f) Calculate average access time if hit ratio is 95%, cache memory access time is 400 nsec and main memory access time is 600 nsec.

