

**BACHELOR OF SCIENCE (COMPUTER SCIENCE) (CBCS - 2018 COURSE)**  
**F.Y.B.Sc.(Computer Science) Sem-II :SUMMER- 2022**  
**SUBJECT : PRINCIPLES OF DIGITAL ELECTRONICS-II**

Day : Wednesday  
Date : 13-07-2022

**S-20083-2022**

Time : 11:00 AM-02:00 PM  
Max. Marks : 60

**N.B**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw diagrams **WHEREVER** necessary.

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

- a) Explain the working of a 3-bit asynchronous down counter with a neat diagram.
- b) Explain the working of JK flip-flop with logic diagram and truth table.
- c) With neat diagram explain the action of 3-bit serial-in-serial - out shift register.

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

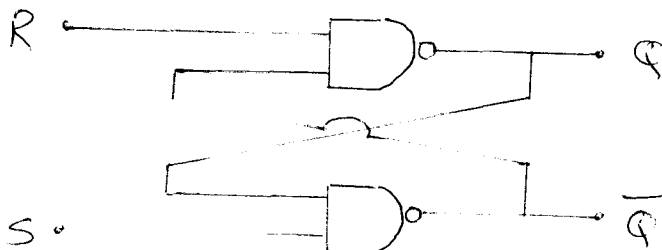
- a) Explain the working of IC 7490 in MOD-5 and MOD-10 mode.
- b) With a neat diagram explain the working of a 3-bit up-down counter.
- c) Explain the action of bistable multivibrator with circuit diagram and waveform.

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

- a) Draw diagram and explain the working of serial-in-serial-out shift register.
- b) State different types of ROM. Explain the working of Diode matrix ROM.
- c) Design a monostable multivibrator for a pulse width of 10ms by using IC 555.

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

- a) An astable 555 timer has  $R_A = 10\text{ K}\Omega$ ,  $R_B = 2\text{ K}\Omega$  and  $C = 0.0047\text{ }\mu\text{F}$ . Find the output frequency and the duty cycle.
- b) State the different modes of shift register? Which is the fastest of them? Why?
- c) Explain T flip-flop with respect to construction, logic symbol and truth table.
- d) Explain the working of the following circuit :



**P.T.O.**

**Q.5** Answer any **FOUR** of the following:

**(12)**

- a) State the difference between:
  - i) Edge triggered and level triggered flip - flop
  - ii) R-S and J - K flip - flop
  
- b) Define the following terms for memory:
  - i) Memory capacity
  - ii) Speed
  - iii) Power consumption
  
- c) What is race-around condition in flip flops? How can it be avoided?
  
- d) Differentiate between:
  - i) Static and dynamic memory
  - ii) Volatile and non – volatile memory
  - iii) PROM and EPROM
  
- e) Draw well labelled diagram for JK master slave flip-flop and give its working in brief.
  
- f) Define the following terms for flip-flop :
  - i) Clock
  - ii) Positive edge trigger
  - iii) Clear

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