

BACHELOR OF SCIENCE (COMPUTER SCIENCE) (CBCS - 2018 COURSE)
F.Y.B.Sc.(Computer Science) Sem-II : WINTER :- 2021
SUBJECT: PRINCIPLES OF DIGITAL ELECTRONICS-II

Day : Saturday
Date 29-01-2022

W-20083-2021

Time : 02:00 PM-05:00 PM
Max. Marks: 60

N.B.:

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

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- Q.1** Attempt **ANY TWO** of the following: [12]
- a) Draw a logic diagram of R-S flip-flop using NAND gates and explain it with its truth table.
 - b) Explain the action of IC 7490 in MOD-2 and MOD -5 mode.
 - c) Explain the action of J-K flip-flop with necessary logic diagram and truth table.
- Q.2** Attempt **ANY TWO** of the following: [12]
- a) Draw neat diagram for 3-bit asynchronous up counter. Also explain its action.
 - b) Explain the following memory: i) Ram ii) ROM iii) EPROM
 - c) Draw and explain the circuit diagram of IC 555 as monostable multivibrator.
- Q.3** Attempt **ANY TWO** of the following: [12]
- a) How IC 7495 is used in left shift and right shift operation? Explain.
 - b) Explain the following flip-flops with respect to logic diagram, symbol and truth table: i) D flip-flop ii) T flip-flop
 - c) Explain the working of bistable multivibrator using IC 555. Also draw waveforms for it.
- Q.4** Attempt **ANY THREE** of the following: [12]
- a) Explain the action of shift register as a ring counter.
 - b) An astable 555 timer has $R_A = 10 \text{ k}\Omega$, $R_B = 2 \text{ K}\Omega$ and $c = 0.0047 \text{ }\mu\text{F}$. Calculate the output frequency and duty cycle.
 - c) Define the following :
i) Modulus of counter ii) Shift register
iii) Flip-flop iv) Counter
 - d) Draw well labelled circuit diagram for 3-bit up/down counter.
- Q.5** Attempt **ANY FOUR** of the following: [12]
- a) Explain the following : i) Preset and Clear ii) Race around condition
 - b) State three points of difference between synchronous and asynchronous counters
 - c) State any three applications of counters.
 - d) Differentiate between static and dynamic memory.
 - e) A shift register has 8 flip-flops. What is a largest number in binary, decimal and hexadecimal that can be stored in it?
 - f) Draw the diagram for parallel-in-parallel-out shift register.

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