

F.Y. B. SC. (COMPUTER SCIENCE) SEM -II (CBCS - 2016

COURSE) : WINTER - 2017

SUBJECT : PRINCIPLES OF DIGITAL ELECTRONICS – II

Day : Tuesday
Date : 14/11/2017

Time : 03.00 PM TO 06.00 PM
Max. Marks : 60

W-2017-0717

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.

Q.1 A) Select the correct option and rewrite the complete sentence: **[06]**

- a) The terminal count for a 3-bit binary counter in UP mode is _____.
i) 000 ii) 111 iii) 101 iv) 010
- b) _____ flip-flops are required to make a MOD – 16 counter.
i) 3 ii) 45 iii) 5 iv) 6
- c) _____ is the condition for J-K flip-flop to toggle.
i) $J = 0, K = 0$ ii) $J = 1, K = 0$ iii) $J = 0, K = 1$ iv) $J = 1, K = 1$
- d) _____ is another name for one shot multivibrator.
i) Monostable ii) Astable iii) Bistable iv) None of these
- e) If both inputs of an R-S flip-flop are low _____ will happen when the clock goes HIGH.
i) An invalid state will exist.
ii) No change will occur in the output.
iii) The output will toggle.
iv) The output will reset.
- f) _____ is the full form of EPROM.
i) Electronic Programmable Read only Memory.
ii) Electronic Peripheral Read only Memory.
iii) Erasable Programmable Read only Memory.
iv) Erasable Peripheral Read only Memory.

B) Answer the questions in one sentence: **[06]**

- a) Find the number of flip-flops required for MOD- 7 counter.
- b) State the role of PRESET and CLEAR terminals in counters.
- c) Give the difference between static and dynamic RAM.
- d) Write any two applications of shift register.
- e) State the difference between synchronous and asynchronous counters.
- f) Define non-volatile memory.

Q.2 Answer **ANY THREE** of the following: **[12]**

- a) Write a short note on diode matrix ROM.
- b) Explain the following flip-flops with respect to logic diagram, symbol and truth table : i) T-Flip-Flop ii) D-Flip-flop.
- c) Draw diagram for 3-bit synchronous up counter. Also draw its timing diagram.
- d) What is race around condition in flip- flops ? How is it avoided in J-K master slave flip-flop?

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Q.3 Answer **ANY FOUR** of the following: [12]

- a) Explain in brief :
 - i) Memory access time
 - ii) Address lines
 - iii) Data lines
- b) Write any three applications of flip-flops.
- c) Draw the block diagram of MOD-6 counter using IC7490.
- d) What is bistable multivibrator? Give any two applications of it.
- e) A shift register has eight flip-flops. What is the largest number in binary, decimal, hexadecimal and octal that can be stored in it?

Q.4 Answer **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 working of J-K flip-flop with logic diagram and truth table.
- c) Explain the action of monostable multivibrator with necessary diagram. Also draw input and output waveforms for it.

Q.5 Answer **ANY TWO** of the following: [12]

- a)
 - i) What is an astable multivibrator?
 - ii) An astable 555 timer has $R_A = 10k\Omega$, $R_B = 2k\Omega$ and $C = 0.0047 \mu F$. What is the output frequency and the duty cycle?
- b) Explain the action of IC 7490 in MOD -2 and MOD- 7 mode.
- c) Explain how IC 7495 is used in left shift and right shift operation.

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