

Government College of Engineering Aurangabad
(An Autonomous Institute of Government of Maharashtra)

SE (Rev) (Information Technology) Examination

End Semester Examination Nov 2016

IT 243: DIGITAL CIRCUIT

11 8 NOV 2016

Time: Three Hours

Max. Marks: 60

“Verify the Course Code & check whether you have got the correct question paper”

N.B:-

- 1. All questions are compulsory*
- 2. Figures to the right indicate full marks*
- 3. Assume suitable data if necessary & state it clearly*
- 4. Use of non-programmable calculator is allowed*

Q.1 Attempt All Questions

(12)

- i) Enlist universal and special purpose gate? Why the gates are called universal gates? Draw OR gate using NAND gate, AND gate using NOR gate & prove its output expression.
- ii) Solve following question 3 marks for each
 - a) Perform BCD subtraction for $976 - 158 = ?$
 - b) Perform Binary subtraction using 2's complement $110010 - 1100011 = ?$

Q.2 Attempt any Two

(12)

- i) Explain 4 bit Binary to Gray code convertor with truth table, K-map and logic diagram.
- ii) Design 4 bit BCD adder using IC 7483. Also explain its working.
- iii) Define multiplexer. Also Implement the following function using 16:1 multiplexer.

$$f(A,B,C,D,E) = \sum m (0, 2, 3, 5, 6, 8, 13, 14, 15, 17, 19, 20, 23, 24, 25, 27, 29, 30, 31)$$

Q.3 Attempt all **(12)**

- i) Define Register. Draw and explain working of 4 bit Bidirectional shift register.
- ii) Draw logic diagram of S-R FF & explain its working. Differentiate between latch & Flip Flop (any 4 differences).

Q.4 Attempt any Two **(12)**

- i) What is mean by Synchronous Counter & Asynchronous Counter? Design 3 bit Synchronous up counter using JK flip flop and draw waveform for it.
- ii) Design MOD-10 Asynchronous counter T flip flop & draw waveform for it.
- iii) Design MOD-7 counter using IC 7490. Why clear/reset is use in MOD counter.

Q.5 Attempt any Two **(12)**

- i) Enlist types of Analog to Digital converter. Explain Dual Slope Analog to Digital converter with neat diagram.
 - ii) Enlist types of Digital to Analog converter. Explain Binary Weighted Resistor Digital to Analog converter with neat diagram.
 - iii) Draw & Explain pin diagram of IC 555 timer. Define Op Amp with its diagram.
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