SE. Electrical IV CBSGS 07·6·17   Q.P. Code :16094   87

[Time: 3 Hours]   [Marks :80]

Please check whether you have got the right question paper.

N.B:
1. Question No.1 is compulsory.
2. Attempt any **Three** questions out remaining five questions.
3. Assume suitable data if necessary and justify the same.

Q1   Attempt any **FOUR**:
- a. Discuss the characteristics of ideal op-amp. Compare ideal and practical op-map.
- b. Draw and explain the functional block diagram of IC 555.
- c. Justify "NAND gate is a Universal gate."
- d. What are shift registers? State its applications.
- e. State various characteristics of digital ICs.

Q2. a. Explain the working of practical integrator circuit using op-map. How it is different from ideal integrator circuit.   10

b. Draw and explain the working of three op-amp instrumentation amplifier. Derive the expression for its gain.   10

Q3. a. Derive the expression for the gain of first order low pass filter and draw its frequency response characteristics.   10

b. Explain operation of monstable multivibrator using IC555. Derive the expression for on time, off time and frequency.   10

Q4. a. Simplify the following logic expression and realize them using gates   10
$F(A,B,C,D) = \pi M (2,8,9,10,11,12,14)$

b. Design 4-bit Gray to Binary code converter.   10

Q5. a. Design a synchronous Mod-6 counter using J-K flip-flop.   10

b. Explain the working of successive approximation A/D converter.   10

Q.6   Solve any **FOUR**   20
- a. Convert JK flip top to SR flip flop.
- b. Implement the following logic function using 8:1 MUX
  $F(A,B,C,D) = \Sigma m (1,3,4,11,12,13,14,15)$
- c. Differentiate between combinational and sequential circuits.
- d. Reduce the expression :
  $$f = A[B + \overline{C} \,\overline{(AB + A\overline{C})}$$
- e. i) Convert $(115)_{10}$ into hexadecimal number.
  li) Convert $(A6F.C9)_{16}$ into Octal number.

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