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[4657]-534

S.E. (Electrical) (First Semester) EXAMINATION, 2014

ANALOG AND DIGITAL ELECTRONICS

(2012 PATTERN)

Time : Two Hours

Maximum Marks : 50

N.B. :— (i) Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6 and Q. 7 or Q. 8.

(ii) Neat diagrams must be drawn wherever necessary.

(iii) Figures to the right indicate full marks.

(iv) Your answers will be valued as a whole.

(v) Assume suitable data, if necessary.

1. (a) Perform the following addition in BCD : [6]

(i) $(36)_{10}$ with $(95)_{10}$

(ii) $(68)_{10}$ with $(74)_{10}$.

(b) Design Mod-6 asynchronous counter using JK flip-flop. [6]

Or

2. (a) Draw and explain clocked SR flip-flop. Also draw its timing diagram. [6]

(b) Use K-map to minimize the following expression in SOP form : [6]

$$Y = (A + \bar{B} + C + \bar{D}) (\bar{A} + B + \bar{C} + D) (\bar{A} + \bar{B} + \bar{C} + \bar{D}) (\bar{A} + \bar{B} + \bar{C} + D).$$

P.T.O.

3. (a) Explain the working of OPAMP as a comparator along with circuit diagram and input and output waveforms. [7]
- (b) Explain the operation of low pass filter with a neat circuit diagram. [6]

Or

4. (a) Explain the operation of IC555 as astable multivibrator along with waveforms. [7]
- (b) Explain grounded type voltage to current converter using OPAMP. [6]
5. (a) Draw and explain construction of FET with its characteristics. [6]
- (b) Draw and explain RC coupled BJT amplifier. [6]

Or

6. (a) Explain AC-DC load line analysis using CE configuration of BJT. [6]
- (b) Explain push-pull amplifier with a neat circuit diagram. [6]
7. (a) Explain the working of single-phase full wave centre tapped rectifier with pure resistive load. Also draw the input and output waveforms. [7]
- (b) Compare single-phase full wave bridge rectifier with three-phase full wave bridge rectifier. [6]

Or

8. (a) Draw and explain three-phase bridge rectifier with R-load. Also draw input voltage and output voltage waveforms. [7]
- (b) A single-phase full wave bridge rectifier is supplied from 230 V, 50 Hz source. The load consists of $R = 10 \Omega$ and a large inductance so as to render the load current constant. Determine :
- (i) Average value of output voltage and output current
- (ii) Average and r.m.s. values of diode currents
- (iii) r.m.s. values of output and input currents. [6]