Seat No.

[4857]-1033

S.E. (Electrical) (First Semester) EXAMINATION, 2015
ANALOG AND DIGITAL ELECTRONICS
(2012 PATTERN)

Time : Two Hours   **Maximum Marks : 50**

N.B. :— (*i*) Neat diagrams must be drawn wherever necessary.

(*ii*) *All* questions are compulsory i.e. (Solve Q. No. **1** *or* Q. No. **2**, Q. No. **3** *or* Q. No. **4**, Q. No. **5** *or* Q. No. **6** and Q. No. **7** *or* Q. No. **8**).

(*iii*) Assume suitable data, if necessary.

(*iv*) Use of logarithmic tables, slide rule, Mollier charts, pocket calculator and steam table is allowed.

(*v*) Figures to the right indicate full marks.

1. (*a*) Convert the following numbers : [6]

    (*i*) $(754.51)_7$ to hexadecimal

    (*ii*) $(7BC.A3)_{16}$ to decimal

    (*iii*) Binary equivalent 110011001010 into its gray code.

(*b*) Design MOD-5 synchronous up counter using JK flip-flop. [6]

Or

2. (*a*) Draw and explain 4-bit SISO shift register. [6]

(*b*) Draw the diagram, timing diagram and write the truth table for twisted ring counter. [6]

3. (*a*) Explain the fixed voltage regulator IC. [6]

(*b*) Explain the working of op-amp as ZCD with waveforms.[7]

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Or

4. (*a*) Explain generation of triangular wave using op-amp. [6]

(*b*) Explain the working of full wave precision rectifier with waveforms. [7]

5. (*a*) Draw and explain the construction of FET with its characteristics. [6]

(*b*) Explain how the Darlington pair improves the current gain. [6]

Or

6. (*a*) Draw and explain class A amplifier. [6]

(*b*) Explain RC coupled amplifier with neat diagram. [6]

7. (*a*) Explain the working of single-phase full wave rectifier with RL load. Draw input and output waveforms. [7]

(*b*) Compare single-phase center tap and bridge rectifiers. [6]

Or

8. (*a*) A half wave diode rectifier uses transformer turns ration 1 : 2 while the input voltage is 200 sin ωt and ω = 100 π rad/sec and the load resistance is 100 Ω. [7]

Calculate :

(*i*) The dc output voltage

(*ii*) Rectification efficiency

(*iii*) Transformer utilization factor

(*iv*) Peak inverse voltage.

(*b*) Draw and explain three-phase half wave rectifier with R load with adequate waveforms. [6]