Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

Seat No.	

[4957]-1033

S.E. (Electrical) (First Semester) EXAMINATION, 2016

ANALOG AND DIGITAL ELECTRONICS

(2012 PATTERN)

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

N.B. :— (*i*) Attempt Q. Nos. **1** *or* **2**, Q. Nos. **3** *or* **4**, Q. Nos. **5** *or* **6**, Q. Nos. **7** *or* **8**.

(*ii*) Neat diagrams must be drawn wherever necessary.

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

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

(*v*) Use of non programmable calculator is permitted.

1. (*a*) Design and explain the operation of MOD 10 asynchronous counter with related timing diagram. [6]

(*b*) Convert the number into its equivalent number with appropriate step. [6]

(*i*) $(0.6234)_{10} = (\quad)_8$

(*ii*) $(B65F)_{16} = (\quad)_{10}$.

Or

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

(*b*) Minimize the following Boolean expression using K-map and realize it using the basic gates. $Y = \Sigma m(1, 3, 5, 9, 11, 13)$. [6]

P.T.O.

3. (*a*) Explain the difference between fixed and variable regulator. Explain with suitable circuit diagram, how IC-317 can act a variable voltage regulator. Also derive formula for variable voltage available at the output of IC LM 317 in terms of circuit parameters. [7]

(*b*) Draw the diagram of IC 555 configured in Astable mode. Draw necessary waveforms. Give the formula for T_{on} and T_{off}. [6]

Or

4. (*a*) Explain the application of OPAMP as Schmitt Tigger. Comment on hysteresis. [7]

(*b*) Explain first order low pass filter with neat circuit diagram and frequency response. [6]

5. (*a*) Draw and explain transfer characteristics of JFET. [6]

(*b*) Explain the operation transistorized transformer coupled CE amplifier with neat circuit diagram. [7]

Or

6. (*a*) What is DC load line ? Derive equation for DC load line and show Q point on DC load line. [6]

(*b*) Write a short note on push pull amplifier. [6]

7. (*a*) A single phase full bridge diode rectifier is supplied from 230 V, 50Hz source. The load consist of R = 10Ω and a large inductance so as to render the load current constant.
Determine :
(*i*) Average values of output voltage and current. [6]
(*ii*) Average and rms values of diode currents.

(*b*) Explain the working of single phase full wave bridge rectifier with RL load with neat sketch and draw its input and output waveform. [7]

Or

8. (*a*) What are the advantages and disadvantages of three phase rectifier over single phase rectifier. [7]

(*b*) The single phase half wave rectifier has purely with R load. Determine : [6]

(*i*) Efficiency

(*ii*) Form factor

(*iii*) Ripple factor

(*iv*) Transformer utilization factor

(*v*) Peak inverse voltage.