Total No. of Questions—**12**] [Total No. of Printed Pages—**4**

Seat No.	

[4857]-153

S.E. (Electrical) (I Sem.) EXAMINATION, 2015

ANALOG AND DIGITAL ELECTRONICS

(2008 PATTERN)

Time : Three Hours **Maximum Marks : 100**

***N.B.* :—** (*i*) Answer Q. No. **1** *or* Q. No. **2**, Q. No. **3** *or* Q. No. **4**, Q. No. **5** *or* Q. No. **6** from Section I and Q. No. **7** *or* Q. No. **8**, Q. No. **9** *or* Q. No. **10**, Q. No. **11** *or* Q. No. **12** from Section II.

(*ii*) Answers to the two Sections should be written in separate answer-books.

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

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

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

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

SECTION I

1. (*a*) Draw and explain input and output characteristics of CB configuration. [8]

(*b*) Draw and explain working of RC-coupled amplifier. [8]

Or

2. (*a*) Explain the drain characteristics of FET. [8]

(*b*) Explain with neat circuit diagram working of Push Pull amplifier. [8]

P.T.O.

3. (*a*) Define the following terms related with operational amplifier and compare their values with those of ideal OPAMP : [8]

(*i*) CMRR

(*ii*) Slew rate

(*iii*) PSRR

(*iv*) Input bias current.

(*b*) What are the types of comparators ? Explain the operation of inverting comparator. Draw the input and output voltage waveform. [8]

Or

4. (*a*) Explain the circuit of voltage to current converter with floating load. Mention the field of applications. [8]

(*b*) Explain OPAMP as : [8]

(*i*) Instrumentation Amplifier

(*ii*) Integrator.

5. (*a*) Draw neat circuit diagram and explain OPAMP as sine wave generator. [9]

(*b*) Draw and explain with frequency response curve first order low pass filter. [9]

Or

6. (*a*) Explain the operation of IC555 as an Astable Multivibrator. [9]

(*b*) Draw the practical voltage regulator using IC LM 317 and justify the use of each component in the circuit. [9]

SECTION II

7. (*a*) Convert the following : [12]

(*i*) What is the decimal equivalent of octal 314.734_{10} ?

(*ii*) Convert given number to Octal equivalent $1E7B_{16}$.

(*iii*) Convert the following binary number to Gray code 111011_{binary}.

(*iv*) Excess-3 code 111011_{binary}.

(*b*) Perform the following operation : [6]

(*i*) Add the following numbers $0FAC_H$ and $387F_H$

(*ii*) Subtract using 2's complement $125_{10} - 68_{10}$.

Or

8. (*a*) What is a comparator ? Design and draw a 1 bit comparator circuit using K-map. [9]

(*b*) Draw and explain 8 : 1 Multiplexer circuit using 4 : 1 multiplexer. [9]

9. (*a*) Draw and discuss logic diagram of JK flip-flop and how to build T flip-flop using JK flip-flop. Write the truth tables for both. [8]

(*b*) Explain 4 bit S I S 0 shift register and hence explain twisted ring counter. Draw timing diagram. [8]

Or

10. (*a*) What is the Modulus of counter ? Design a MOD-10 counter draw circuit diagram, truth table of 4 bit ripple counter. [8]

(*b*) Design 1 : 4 De-multiplexer using K-map. [8]

11. (*a*) Give the complete classification of memories. [8]

(*b*) Differentiate between Synchronous and Asynchronous counter. Draw the circuit diagram of Synchronous counter using JK flip-flops. [8]

Or

12. (*a*) Differentiate between Multiplexer and De-multiplexer with its applications. [8]

(*b*) Explain R-2R ladder Digital to Analog converter. [8]