Total No. of printed pages = 4

3 (Sem 3) ELE

2015

ELECTRONICS

(General)

(Linear Active Circuits and Digital Systems)

Full Marks – 40

Time – Two hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer from the multiple choices given for each question : 1×4=4

   (a) A transistor that can be used in enhancement mode is

   (i) npn transistor

   (ii) UJT

   (iii) JFET

   (iv) MOSFET

[Turn over

(b) The output impedance of an ideal opamp is

(i) 50 ohm (ii) 100 ohm

(iii) Infinite (iv) Zero

(c) A device that converts from decimal to binary number is called

(i) Encoder

(ii) Decoder

(iii) Converter

(iv) None of the above

(d) How many inputs can be supplied to a logic circuit with a far in factor of four ?

(i) Two (ii) Three

(iii) Four (iv) Eight

2. Answer the following : 2×3=6

(a) Define offset (Input) voltage and slew rate of an opamp.

(b) Discuss the advantages of JFET.

(c) Convert the following :

(i) 37_{16} to binary

(ii) 11_{8} to binary

3. Answer the following :

(a) Give the general theory of feedback. Explain different types of negative feedback. 2+3=5

Or

What is Barklausen criterion for oscillator ? Draw the circuit diagram of phase shift oscillator. 2+3=5

(b) Minimize the following Boolean function $f(A,B,C) = \bar{A}B+\bar{A}\bar{B}\bar{C}+AB\bar{C}+A\bar{B}\bar{C}$ using Karnaugh map method. 5

Or

What do you mean by half adder and full adder ? Describe briefly the function of full adder with its logic circuit and truth table. 2+3=5

4. Answer the following :

(a) Mention some characteristics of an ideal opamp. Derive the relation for the gain of an opamp connected in non-inverting mode. 2+3=5

Or

Explain briefly, the working principle of a Unijunction Transistor (UJT). 5

(b) What are the different types of logic gates ? Realize the logic functions NOT and AND using only NAND gates. 1+4=5

Or

Describe briefly the different types of semiconductor memories. 5

5. Write short notes on any *two* : 5×2=10

(a) Active filter

(b) Distortion in amplifier

(c) Multiplexer and demultiplexer

(d) Flip-Flop.