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

Seat No.	

[4856]-103

F.E. EXAMINATION, 2015

BASIC ELECTRONICS ENGINEERING

(2012 PATTERN)

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

N.B. :— (*i*) Figures to the right indicate full marks.

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

(*iii*) Use of electronic pocket calculator is allowed.

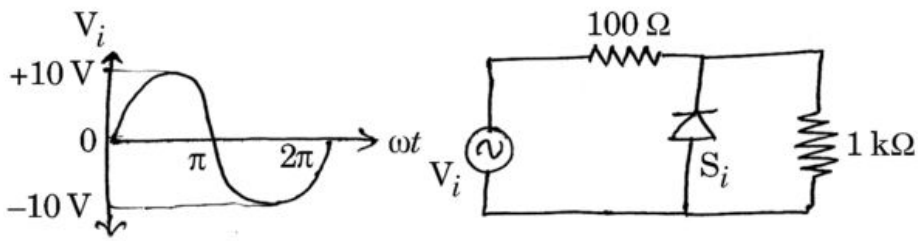
(*iv*) Assume suitable data, if necessary.

1. (*a*) Compare Half Wave and Full Wave Rectifier. [6]

(*b*) Explain operation of *n*-channel enhancement type MOSFET with its characteristics. [6]

Or

2. (*a*) Determine output waveform for the circuit shown in figure : [6]



(*b*) Draw the output characteristics of BJT in CE configuration. Indicate all the three regions of operation on it. Explain the operation of BJT as a switch. [6]

P.T.O.

3. (*a*) Draw the circuit diagram and write output equation for : [6]

(*i*) Non-inverting summer with three inputs

(*ii*) Ideal Differentiator.

(*b*) Compare Microprocessor and Microcontroller. [4]

(*c*) Prove the following using De Morgan's Theorem : [2]

$$\overline{(A + B) \cdot (C + D)} = (\overline{A} \cdot \overline{B}) + (\overline{C} \cdot \overline{D}).$$

Or

4. (*a*) For inverting amplifier using op-amp if R_f = 100 kΩ, R_1 = 10 kΩ, V_{CC} = ±10 V, V_i = 2 V d.c. : [6]

(*i*) Calculate output voltage

(*ii*) Is the result in part (*i*) is practically possible ? Justify.

(*b*) How to implement full adder using 2 half adders and logic gates ? Explain. [6]

5. (*a*) Draw Block diagram of electronic weighing machine and explain its operation. [6]

(*b*) Explain the construction of DIAC. Draw and explain its characteristics. [7]

Or

6. (*a*) Explain digital thermometer with block diagram. [6]

(*b*) Define the following terms for SCR : [5]

(*i*) Holding current

(*ii*) Latching current

(*iii*) Forward breakover voltage

(*iv*) Reverse breakover voltage

(*v*) Turn ON time for SCR.

(*c*) List applications of SCR. [2]

7. (*a*) What is need of modulation ? Explain frequency modulation in detail. [7]

(*b*) Draw and explain block diagram of mobile communication system. [6]

Or

8. (*a*) Draw AM waveforms for : [3]

(*i*) Modulation index = 1

(*ii*) Modulation index > 1

(*iii*) Modulation index < 1

(*b*) Write short notes on : [6]

(*i*) Twisted Pair Cable

(*ii*) Fiber Optic Cable.

(*c*) Compare amplitude modulation and frequency modulation. [4]