

Seat No.	
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[4856]-103

F.E. EXAMINATION, 2015
BASIC ELECTRONICS ENGINEERING
(2012 PATTERN)

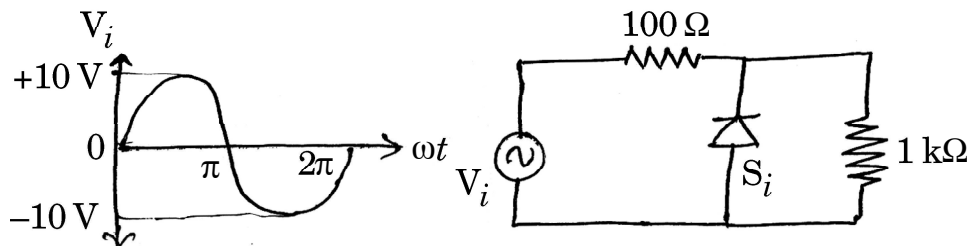
Time : Two Hours**Maximum Marks : 50**

- 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]

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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]

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

Or

4. (a) For inverting amplifier using op-amp if $R_f = 100 \text{ k}\Omega$,
 $R_1 = 10 \text{ k}\Omega$, $V_{CC} = \pm 10 \text{ V}$, $V_i = 2 \text{ V d.c.}$: [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]