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BT-303

Roll No.

**B. TECH, B. TECH + MBA DUAL DEGREE
PROGRAMMES (CSE, IT, ECE, MAE,
CE, E & EE, E & I, NS & T),**

B. TECH (MAE) + M. TECH (A) – DD,

B. TECH + M. TECH (NS & T) – DD &

B. TECH (CSE, ECE, MAE) – EVENING

**THIRD SEMESTER END TERM EXAMINATION :
NOVEMBER, 2013**

BASIC ELECTRONICS ENGINEERING

Time : 3 Hrs.

Maximum Marks : 70

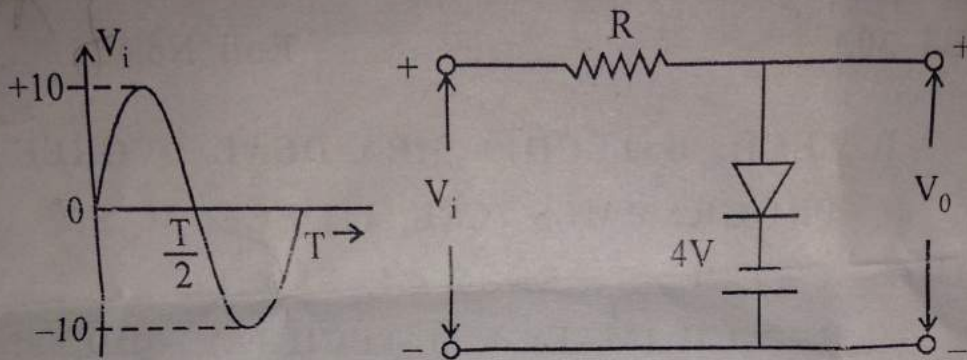
Note: Attempt questions from all sections as directed.

SECTION – A (30 Marks)

Attempt any 5 questions.

Each question carries 6 marks.

1. What do you understand by depletion region? Draw the energy band diagram of a PN junction and explain the working of diode.
2. (a) Draw the output of given clipper circuit.



- (b) Why common emitter (CE) configuration of transistor is preferred over other configuration. Derive relation between α , β .
- Draw the truth table of full full subtractor. Show how a full adder can be converted to a full subtractor with the addition of NOT gate.
 - The load resistance of a centre-tapped full wave rectifier is 500Ω and necessary voltage (end to end) is $60 \sin(100\pi t)$. Calculate (i) peak, average and rms values of current (ii) Ripple factor (iii) Efficiency of the rectifier. Each diode has an idealized I-V characteristics having slop corresponding to a resistance of 50Ω .
 - Reduce the following function in SOP & POS form using K-Map (4+2)

$$F = \Sigma(3,4,13,15) + \Sigma d(1,2,5,6,8,10,12,14)$$
 Implement the simplified function using logic gates.

6. Explain the working of common emitter amplifier with the help of circuit diagram. Also explain the effect of coupling and by-pass capacitor in a circuit.

SECTION - B (20 Marks)

Attempt any two questions.

Each question carries 10 marks.

7. Explain the working of CB npn transistor configuration and draw input and output characteristics. Show that $I_{CEQ} = I_{CBO} / (1 - \alpha)$ at $I_B = 0 \mu A$. (6+4)

8. (a) What is the significant difference between the construction of an enhancement type MOSFET and depletion type MOSFET? Explain the working of enhancement type MOSFET and draw input and output characteristics. (7)

- (b) Explain the terms in Op-amp

- (i) Input offset current
(ii) Slew Rate
(iii) CMRR

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(3)

9. Draw the circuit diagram of an inverting amplifier using OP-AMP and derive the expression for its voltage gain. Locate the virtual ground point in the circuit and explain its significance.

P.T.O.