**D 32969** (Pages : 2) Name.....

Reg. No.....



# THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2012

Electrical and Electronics Engineering

EE 04 305 – ELECTRONICS – I

(2004 Admissions)

Time : Three Hours Maximum : 100 Marks

*Answer* **all** *questions.*

## Part A

I. (a) Write short note on diffusion capacitance of a diode.

(b) Compare E-MOSFET and D-MOSFET.

(c) Explain with relevant diagrams, the working of a bridge rectifier.

(d) Explain the working of a double limiter circuit.

(e) Explain thermal runaway.

(f) Compare small signal and large signal operation of amplifiers.

(g) Explain the importance of by-pass capacitor in amplifier.

(h) Write a short note on typical frequency response of an amplifier.

(8 × 5 = 40 marks)

## Part B

II. (a) In an open-circuited step-graded *p-n* junction, derive expression for the contact difference potential.

(b) Explain the V-I characteristics of a *p-n* junction diode.

(8 + 7 = 15 marks)

*Or*

(c) Explain the construction and characteristics of CB-BJT.

(d) Explain the features of Schottky barrier junction.

(10 + 5 = 15 marks)

**Turn over**

III. (a) Explain with relevant diagrams, the circuit of a full-wave rectifier. Derive the expressions for ripple factor, efficiency and TUF.

(15 marks)

*Or*

(b) Compare LC and RC filters.

(c) Explain with necessary diagrams, the working of positive and negative damper.

(7 + 8 = 15 marks)

IV. (a) Draw the *h*-parameter equivalent circuit of CE-BJT and derive the expression for current gain, input resistance, voltage gain and output admittance.

(15 marks)

*Or*

(b) Explain with necessary diagrams, the working of a class-B push-pull amplifier. Also obtain value of maximum conversion efficiency.

(15 marks)

V. (a) Draw the hybrid-Pi model for transistor in CE configuration and explain the meaning of each component.

(15 marks)

*Or*

(b) Explain the operation of a differential amplifier and define the terms :

(i) Common mode gain.

(ii) Differential mode gain.

(c) What is a current mirror?

(10 + 5 = 15 marks)

[4 × 15 = 60 marks]