D 51494 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2008

AI 04 306 – ELECTRONIC CIRCUITS

(2004 Admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

I. (a) Among the three transistor configurations, which one do you think is best suitable for the following applications (i) impedance matching ; (ii) power amplifier. Give reasons to support your answer.

(b) Draw the circuit diagram of emitter follower.

(c) Derive the relationship between f_B and f_r.

(d) Express your view about choice of transistor configuration in cascode amplifier.

(e) Draw the structure and V.I. characteristics of UJT.

(f) Differentiate between MESFET and MOSFET.

(g) Define CMRR and input impedance of differential amplifier.

(h) Draw the transfer characteristics of differential amplifier. Over what range does a differential amplifier acts as a good limiter?

(8 × 5 = 40 marks)

II. (a) (i) What are the three different parameters of JFET? Explain briefly.

(ii) Derive an expression for transconductance g_m of a JFET in terms of V_P, I_{DSS} and I_D.

(iii) What is a Darlington pair? What is the practical limitation of Darlington circuit?

(6 + 5 + 4 = 15 marks)

Or

(b) Obtain the expressions for current gain, voltage gain, power gain, input and output impedance of a CE amplifier.

(15 marks)

III. (a) Draw the high frequency hybrid II model of a common Emitter transistor. What are the merits of the model? Discuss the validity of various components.

(15 marks)

Or

Turn over

(b) Draw the circuit diagram of a cascode amplifier and explain the principle of operation. Derive an expression for output voltage V_0.

(8 + 7 = 15 marks)

IV. (a) Explain with neat diagram, the construction operation of a N-channel Enhancement MOSFET. (15 marks)

Or

(b) Explain the construction, principle and V-I characteristics of UJT. Mention the advantages and applications.

(15 marks)

V. (a) (i) Explain the significance of CMRR.

(ii) Write notes on GaAs amplifier.

(7 + 8 = 15 marks)

Or

(b) Explain the working of BJT differential amplifier using small signal model.

(15 marks)

[4 × 15 = 60 marks]