



**GU-21234**

Seat No. \_\_\_\_\_

**M. Sc. (ECI) (Sem. - IV) Examination**

**May / June - 2009**

**Paper - XIV : Common Electronics Circuits : Amplifiers**

Time : 3 Hours]

[Total Marks : 70

- Instructions :** (1) All questions carry equal marks.  
(2) Attempt any seven questions.  
(3) Figures on right hand side indicate marks.

- 1 (a) Draw the practical circuit of a transistor amplifier in CE configuration with self bias. Explain the function of each component. 5  
(b) Discuss the  $r'_e$  model of a CE transistor amplifier. No need to consider  $R_s$  effect. 5
- 2 (a) Draw the circuit diagram of common collector transistor amplifier with emitter current biasing. Discuss about its input impedance and output impedance. 5  
(b) Explain any two from the following : 5  
(i) Alpha cut off frequency  
(ii)  $f_T$  parameter of a transistor  
(iii) Gain bandwidth product.
- 3 (a) Write on Thermal noise and shot noise in amplifier. What is a noise figure ? Write its formula. 5  
(b) Draw the RC coupled transistor amplifier circuit. Explain its operation. What is its response for the mid frequency range ? 5
- 4 (a) Write a note on differential amplifier. 5  
(b) Draw the circuit transformer - coupled class - A power amplifier and explain its operation. 5

- 5 (a) Draw the circuit diagram of class - B push - pull amplifier and explain its operation. 5
- (b) Draw the block diagram of the following feedback amplifier : 5
- (i) voltage - series feedback
- (ii) voltage - shunt feedback
- (iii) current - series feedback
- (iv) current - shunt feedback
- 6 (a) Prove that series voltage negative feedback increases the input impedance of an amplifier by a factor  $(1 + \beta A)$ . 5
- (b) Write a note on emitter follower. 5
- 7 (a) Write on the following : 5
- (i) Quality factor of a series resonant circuit.
- (ii) Advantages of tuned circuits.
- (b) Discuss the double tuned amplifier with circuit diagram, circuit operation and frequency response curve. 5
- 8 (a) Draw the circuit diagram for two stages direct coupled transistor amplifier and explain its operation. Discuss voltage gain and frequency response. 5
- (b) Discuss current gain for Darlington amplifier. 5
- 9 (a) Discuss Nyquist criterion for stability. 5
- (b) What is load line and how is it used in the calculation of current and voltage gain for a single stage amplifier. 5
- 10 Answer briefly : 10
- (a) What is Miller effect ?
- (b) Why does RC coupling give constant gain over mid frequency range ?
- (c) Why a power amplifier is always preceded by a voltage amplifier ?
- (d) Why an emitter follower is called so ?
- (e) What is the fundamental difference between audio amplifier and tuned amplifier ?