

D 30912

(Pages : 2)

Name.....

Reg. No.....

**THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
OCTOBER 2012**

Applied Electronics and Instrumentation

AI 09 303—ELECTRONIC CIRCUITS—I

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all questions.

1. Explain the effect of temperature on the volt-ampere characteristic of a diode.
2. Why do we need filters in a power supply ? Under what condition we shall prefer a capacitor filter ?
3. Draw the circuit diagram of a common emitter amplifies with emitter and voltage divider biasing circuit. Why normally an emitter bypass capacitors is used ?
4. Draw the circuit diagram of a RC coupled amplifier using PNP transistor.
5. (a) How does the drain current vary with gate voltage in the saturation region.
(b) How does the trans conductance vary with drain current ?

(5 × 2 = 10 marks)

Part B

Answer any four questions.

6. Draw two biasing circuits for a JFET or a depletion type MOSFET.
7. What are the important applications of a diode ?
8. A full wave rectifier with a center tapped transformer (10 – 0 – 10 V) supplies a load current of 100 mA. Neglecting the diode forward resistance and secondary winding resistance, find (a) the d.c. output voltage (b) PIV of each diode and (c) ripple frequency.
9. Explain the V-I characteristics of UJT. Why it is called a current controlled negative resistance device ?
10. Explain how will you determine h -parameters of a transistor experimentally.
11. Give a circuit diagram of a two-stage transistorized RC coupled amplifier. Also draw the frequency response of the amplifier.

(4 × 5 = 20 marks)

Part C

Answer all questions.

12. (A) (i) What are the different types of inductors ? Explain them with their constructional features. Give some important applications of inductors. (5 marks)
- (ii) Explain briefly about the basic construction of an electrolytic capacitor. (5 marks)

Or

Turn over

- (B) (i) Explain with suitable diagram how a diode can be used as a peak clipper and a base clipper as series element and shunt element. Draw a circuit for a slices. (5 marks)
- (ii) What is the purpose of a clamping circuit ? Explain the working of a diode clamper. How clamping to a d.c. level is achieved. (5 marks)
13. (A) (i) Explain the operation of short circuit protection against overload with neat circuit diagram. (5 marks)
- (ii) A 10 V zener diode is used to regulate the voltage across a variable load resistor. The input voltage varies between 13 and 16 V. The load current (I_L) varies between 10 and 85 mA. The minimum zener current is 15 mA. Find (i) the maximum value of R_s and the maximum power dissipated by the zener diode, using this value of R_s . (5 marks)

Or

- (B) (i) Draw the circuit diagram of half wave rectifier. Explain its working. What is the frequency of ripple in its output ? (6 marks)
- (ii) A full-wave rectifier supplies 0.2 A current at 30 V d.c. Find the ripple factor to be expected when two 100 mF capacitors and a 5 H inductor are used in Pi-filter with a 50 Hz supply. (4 marks)
14. (A) Develop a low frequency equivalent circuit for a basic common collector amplifier and derive the relations for the current gain, voltage gain, input resistance in terms of h -parameters. Make suitable assumptions and simplify the final results. Also justify the name emitter follower for this type of amplifier.

Or

- (B) (i) With the help of a suitable circuit diagram, explain the working of a RC coupled amplifier. Derive the expression for voltage gain of the amplifier. (6 marks)
- (ii) Explain with suitable circuit diagram, the operation of transformer coupled transistorized amplifier. (4 marks)
15. (A) How a small signal high frequency model is different from a low frequency model ? Explain it briefly. (10 marks)

Or

- (B) Draw neatly the circuit diagram of a common source JFET amplifier and explain its working. (10 marks)