C 3183

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Fourth Semester

(Regulation 2004)

Electrical and Electronics Engineering

EC 1261 — ELECTRONIC CIRCUITS

(Common to B.E. (Part-Time) Third Semester R – 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. How class A, Class B and Class AB amplifiers differ based on conduction?

2. What is the difference between cascade and Darlington connection?

3. A tuned circuit has a resonant frequency of 1600 KHz and a bandwidth of 10 KHz. What is the value of its Q-factor?

4. Define common mode rejection ratio.

5. List out four different ways of connecting the feedback amplifier.

6. A Wein bridge oscillator is used for operation with the frequency of 10 KHz . If the value of $R = 100\ \text{K}\Omega$, find the value of the capacitor C?

7. Draw the capacitor voltage waveform of a RC circuit when a square wave is applied as an input .

8. What is a clamper?

9. A full wave rectifier using capacitor filter has to supply 30 V dc to a load resistance of 1 KΩ. Estimate the value of capacitor filter for a ripple factor of 0.01.

10. Define voltage regulation.

PART B — (5 × 16 = 80 marks)

11. (a) (i) For a class B amplifier using a supply of V_{cc} = 30 V and driving a load of 16 Ω, determine the maximum input power, output power, efficiency and transistor dissipation. (8)

(ii) Draw the circuit diagram of JFET CS amplifier in the self bias configuration. Obtain its small signal equivalent and the expression for z_i, z_o and A_v. (8)

Or

(b) (i) For the FET biasing circuit shown in Fig. 11 (b) (i) determine quiescent point, V_{DS}, V_D, V_G and V_S. (8)

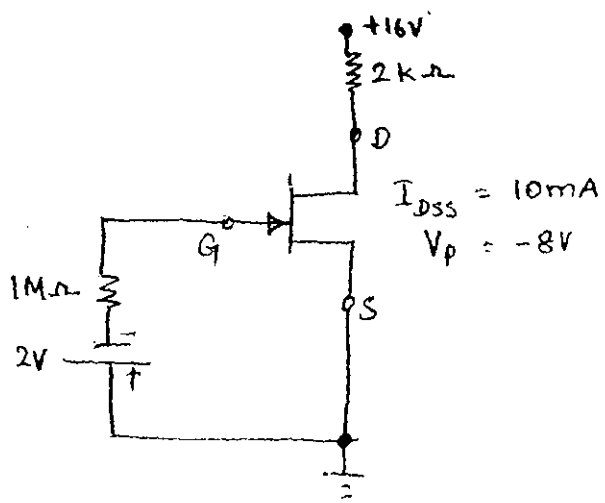

Fig. 11 (b) (i)

(ii) Draw the circuit diagram of a class A transformer coupled amplifier using npn transistor . Explain its working. (8)

12. (a) What is a differential amplifier? Explain its working in common mode operation. Obtain its ac equivalent circuit and derive the expression for voltage gain. (16)

Or

(b) (i) With the help of a circuit diagram explain the working of a single tuned amplifier and discuss its limitations. (8)

(ii) Calculate the dc bias values I_c and V_c for the circuit shown in Fig. 12 (b) (ii). (8)

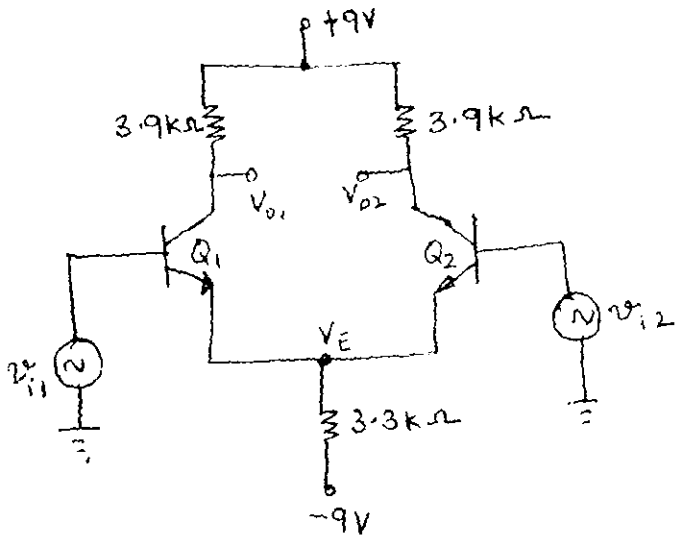

Fig. 12 (b) (ii)

13. (a) (i) Discuss in detail the characteristics of negative feedback amplifier. (8)

(ii) Give a short note on crystal oscillator. (8)

Or

(b) (i) Determine the voltage gain, input and output impedance with feedback for voltage series feedback having A = –100, R_i = 10 KΩ, R_o = 20 KΩ and β = –0.1. (8)

(ii) With a neat circuit diagram explain the working of phase shift oscillator. Derive the expression for its frequency of oscillation. (8)

14. (a) Draw the circuit diagram of a monostable multivibrator. Explain its working with relevant waveforms. (16)

Or

(b) (i) Draw the circuit diagram of a UJT relaxation oscillator. Sketch the output waveforms and explain the circuit operation. (8)

(ii) Define the following in a Schmitt trigger circuit-upper trigger point, lower trigger point, hysteresis and regeneration. (8)

15. (a) (i) For the full wave rectifier circuit shown in Fig. 15 (a) (i) determine dc output voltage and peak inverse voltage. (8)

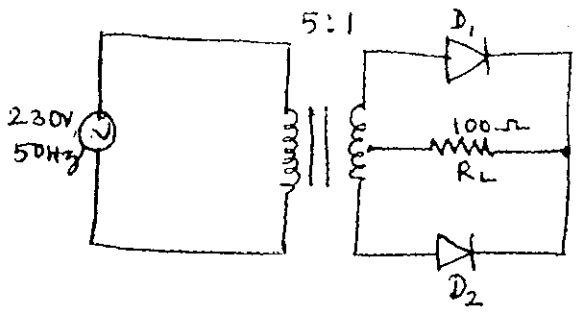

Fig. 15 (a) (i)

(ii) Give a short note on series voltage regulation. (8)

Or

(b) Describe the working of full wave rectifier with LC filter and derive the expression for ripple factor with and without filter. (16)