

Code: 9A04301

II B. Tech I Semester (R09) Supplementary Examinations, May 2012

ELECTRONIC DEVICES & CIRCUITS

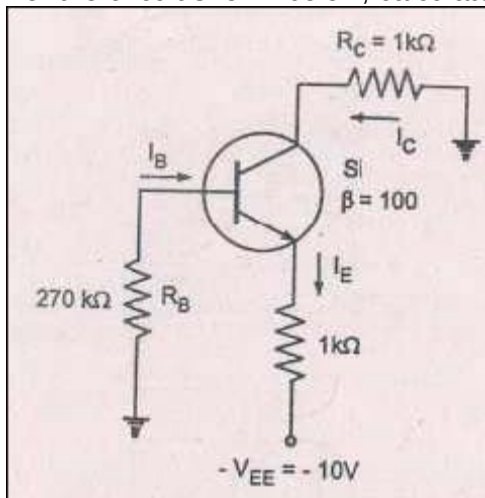
(Common to EIE, E.Con.E, ECE, ECC, CSS, IT, CSE, EEE & MCT)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What are the various applications of p-n junction diode? Explain them.
(b) What are the specifications of p-n junction diode? Explain how reverse saturation current varies with temperature both in Silicon and Germanium diodes.
- 2 (a) Calculate the value of capacitance to use in a capacitor filter connected to a full wave rectifier operating at a standard aircraft power frequency of 400 Hz, if the ripple factor is 10% for a load of 500 Ω
(b) Design a filter for full wave circuit with LC filter to provide an output voltage of 10 V with a load current of 200mA and the ripple is limited to 2%.
- 3 (a) The current gain of a transistor in CE circuit is 49. Calculate CB current gain and find the base current where the emitter current is 3mA.
(b) With neat diagram explain transistor current components.
- 4 (a) For the circuit shown below, calculate I_B , V_C and V_{CE} .



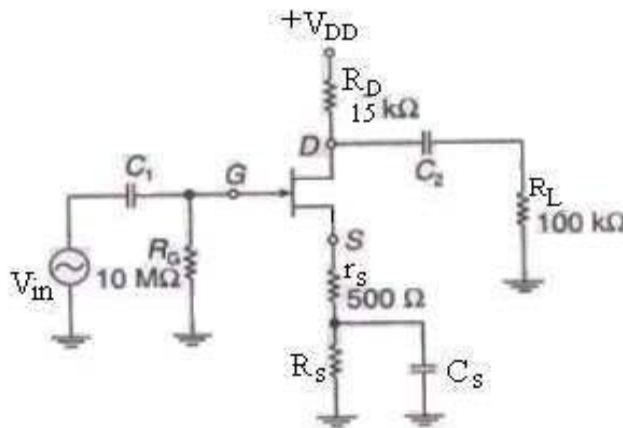
- (b) Differentiate bias stabilization and compensation techniques.
- 5 (a) Explain the principle of MOSFET in depletion mode with neat sketches and o/p characteristics.
(b) Write about the broad classification of FET.

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- 6 (a) The figure shown below is a swamped FET amplifier. Determine the voltage gain when $R_L = 100 \text{ K}$. Neglect the FET output resistance (r_d). Take $g_m = 4 \text{ mS}$.



- (b) How should the gate-source junction of a JFET be biased? Explain how the potential applied to this junction controls the drain current.
- 7 Derive the equations of current gain A_i , voltage gain A_v , input impedance Z_i , output impedance Y_o , voltage gain with R_s (A_{v_s}), current gain with R_s (A_{i_s}) using a general two port active network.
- 8 (a) Draw the V-I characteristics of an SCR and explain it in detail.
(b) Obtain the relation between peak-point voltage ' V_P ' on the UJT characteristics, supply voltage ' V_{BB} ', Intrinsic stand-off ratio ' η ' and the barrier potential of P-N junction. Explain the significance of peak-point voltage on switching action of UJT device.
