

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)

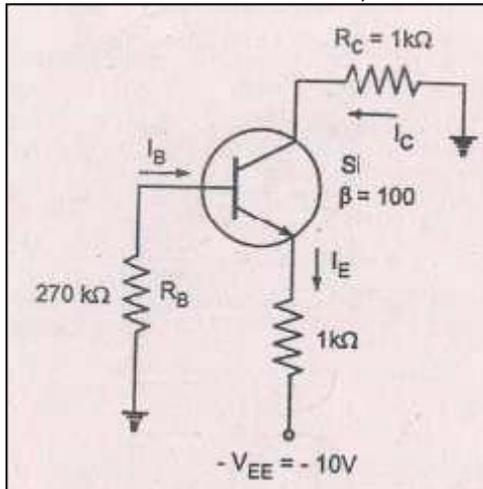
Time: 3 hours

Max Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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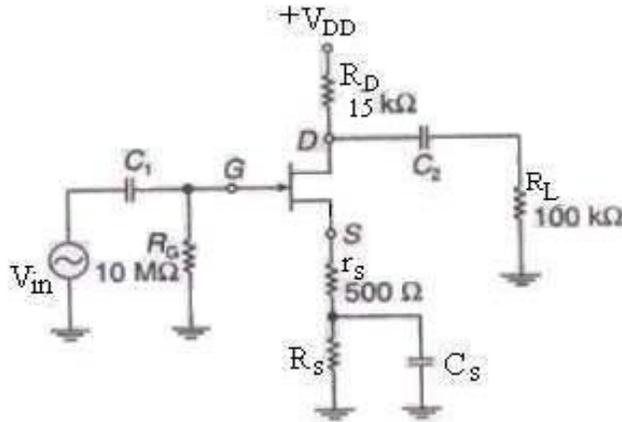
- 1 (a) What are the various applications of p-n junction diode? Explain them.  
(b) What are the specifications of p-n junction diode? Explain how reverse saturation current varies with temperature both in Silicon and Germanium diodes.
- 2 (a) Calculate the value of capacitance to use in a capacitor 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  $\Omega$   
(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 ' $\eta$ ' and the barrier potential of P-N junction. Explain the significance of peak-point voltage on switching action of UJT device.

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