

Code :9A04301

**R9****II B.Tech I Semester(R09) Supplementary Examinations, May 2011****ELECTRONIC DEVICES & CIRCUITS**

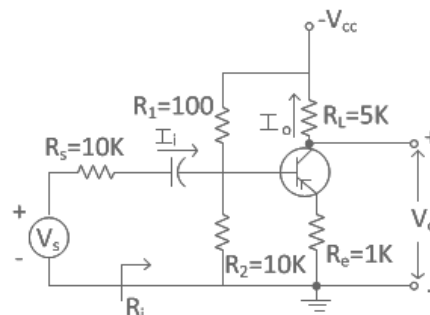
(Electronics & Instrumentation Engineering, Electronics & Control Engineering, Electronics & Communication Engineering, Electronics & Computer Engineering, Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions  
All questions carry equal marks  
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- Discuss PN diode VI characteristics with neat sketch.
  - Calculate the factor by which the current will increase in a silicon diode operating at a forward voltage of 0.4Volts, when the temperature is raised from 25 C to 150 C.
- With circuit and necessary waveforms explain the operation of Bridge Rectifier.
  - Design a filter for FWR circuit with LC filter to provide an output voltage of 10 Volts with a load current of 200mA and the ripple is limited to 2%.
- With neat sketch explain the different current components of transistor.
  - In an NPN transistor emitter is grounded, base is connected with 4 Volts supply in series with 100 K ohms resistor and collector base is connected with 4 Volts supply in series with 2K ohms. Assume  $V_{CC} = 12\text{Volts}$ ,  $V_{BE} = 0.7\text{ Volts}$ ,  $\beta = 100$ . Find  $I_B, I_C$  and  $I_E$
- Explain diode compensation circuit for variations in  $I_C$  for self bias circuit.
  - How self bias circuit will eliminate drawbacks in fixed bias circuit.
- With neat structure explain the principle of operation of depletion MOSFET.
  - Explain drain characteristics of JFET.
- Derive an expression for voltage gain, Input Impedance and output impedance of CG amplifier at low frequencies.
  - In an N - channel JFET based voltage divider common drain configuration, determine the value of resistor  $R_s$  so as to have the operating point as  $IDQ = 5\text{mA}$ ,  $V_{DSQ} = 10\text{V}$ . Given that  $V_{DD} = 28\text{ V}$ ,  $R_1 = 1\text{ M ohms}$ ,  $R_2 = 0.5\text{ M ohms}$ , saturation drain current of the FFET is 10 mA and gate source pinch off voltage is '-5V'.
- For the transistor amplifier shown below, Compute  $A_I = I_0/I_i$ ,  $A_v$ ,  $A_{vs}$  and  $R_i$ . Assume  $h_{ie} = 1100\text{ ohms}$ ,  $h_{fe} = 50$ ,  $h_{re} = 2.5 \times 10^{-4}$   $h_{oe} = 24\mu\text{A/V}$



- Discuss the principle of operation of
  - Varactor Diode
  - LED
  - LDR

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