

[05 - 2113]

II/IV B.E. DEGREE EXAMINATION.

First Semester

Electronics and Communication Engineering

ELECTRONIC DEVICES AND CIRCUITS

(Common with Electrical and Electronics Engineering
and Electronics and Instrumentation Engineering and
M.S. ECE and M.S. EEE)

(Effective from the admitted batch of 2006-2007)

Time : Three hours

Maximum : 70 marks

First question is compulsory.

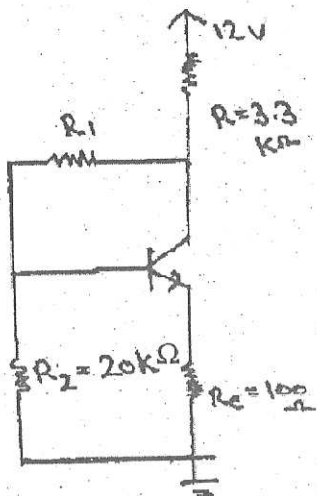
Answer any FOUR out of the remaining questions.

All questions carry equal marks.

1. (a) What is diffusion current mechanism in semiconductors?
- (b) State applications of Tunnel diode.
- (c) Distinguish between Centre - tapped FWR and Bridge Rectifier.
- (d) Give the features of CC configuration.
- (e) Draw the small signal model of JFET.

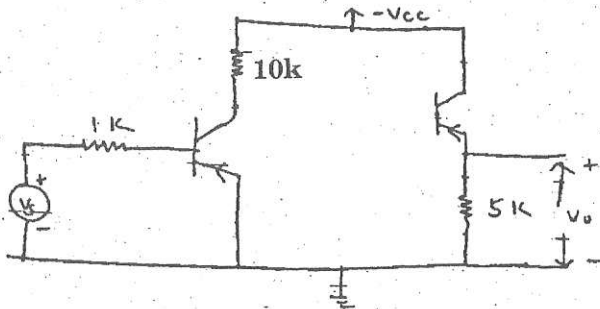
- (f) Explain thermal runaway.
- (g) What is the need for bypass and coupling capacitors in amplifier circuits?
2. (a) Explain the position of Fermi level on Intrinsic and Extrinsic semiconductors.
- (b) Find the concentration of holes and electrons in a n-type silicon at 300K of the conductivity is $0.1(\Omega - cm)^{-1}$.
3. (a) Explain the temperature dependence P-N diode V-I characteristics.
- (b) Discuss about Avalanche and Zener breakdown mechanisms.
4. The voltage at the input capacitor of a Π - section filter is given by $v(t) = 525 - 40 \sin 745 t$. The output capacitance of the filter is $10 \mu F$. If the filter d.c. output voltage is 500V for a 100 mA load with a ripple factor of 0.001, determine the inductance and d.c. resistance of the filter choke.

5. (a) Explain about CB input and output characteristics.
- (b) If $\alpha = 0.98$ and $V_{BE} = 0.6V$. Find R_1 in the circuit shown for an $I_E = -2mA$. Neglect reverse saturation current.



6. (a) Explain how FET will act as VVR.
- (b) With neat structure explain about depletion mode MOSFET.
7. (a) Derive an expression for stability factor 'S' on transistor self bias circuit.
- (b) Discuss different biasing considerations of FETs.

8. Find the voltage gain A_{VS} of the amplifier shown below.



Assume $h_{ie} = 1000\Omega$, $h_{re} = 10^{-4}$,

$$h_{fe} = 50, h_{oe} = 10^{-8} \text{ A/V}.$$