Total No. of Questions-8] [Total No. of Printed Pages-4

B.E. III Semester Examination

BE - III/6(B)

214485

IT. ENGG.

Course No.: ECE - 313

(Basic Electronics)

Time Allowed- 3 Hours *Maximum Marks-100*

***Note** : Attempt any **five** questions in all by selecting atleast **one** question from each Unit . All questions carry **equal** marks.*

Unit - I

1. a) Draw & Explain the working of P-N-diode, its Equivalent circuit, V-I characteristics & Temperature effect on V-I characteristics with Equation. **12**

   b) Estimate the value of Zener series resister if $V_z = 11.8V$ $P_z = 400$ mw and $V_{in} = 17v$ to $19.5v$ State assumptions if any. It is shown in fig 1. **8**

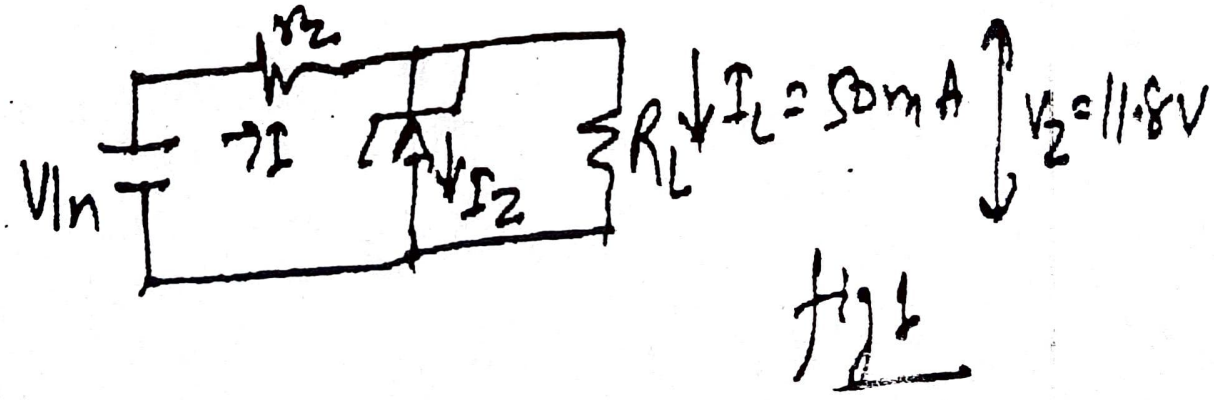


Fig 1

OR

2. a) Explain the working of Full wave rectifier using centre tap transformer & derive an Expression for I_{avg}, I_{rms}, V_{avg}, V_{rms}, power, η, r.f., T.U.F. **20**

Unit - II

3. a) Explain with neat diagram, the working of Transistor in biased and unbiased condition. Also derive Generalized Transistor Equation. **10**

b) Draw & Explain the common Base configuration.showI/P & O/P characteristics with active, Saturation and cutoff region. How early effect affects the characteristics? **10**

OR

4. a) Explain the need for stabilization. Explain the different Bias compensation Techniques. **10**

b) A Ge transistor having $h_{FE} = 50$ is to be used as an amplifier with $V_{cc} = 12V$ & $R_c = 2k\Omega$. Select suitable operating point, determine bias resistance (R_B) & Stability factor (S) for:-

i) Fixed Bias

ii) Collector to Base bias

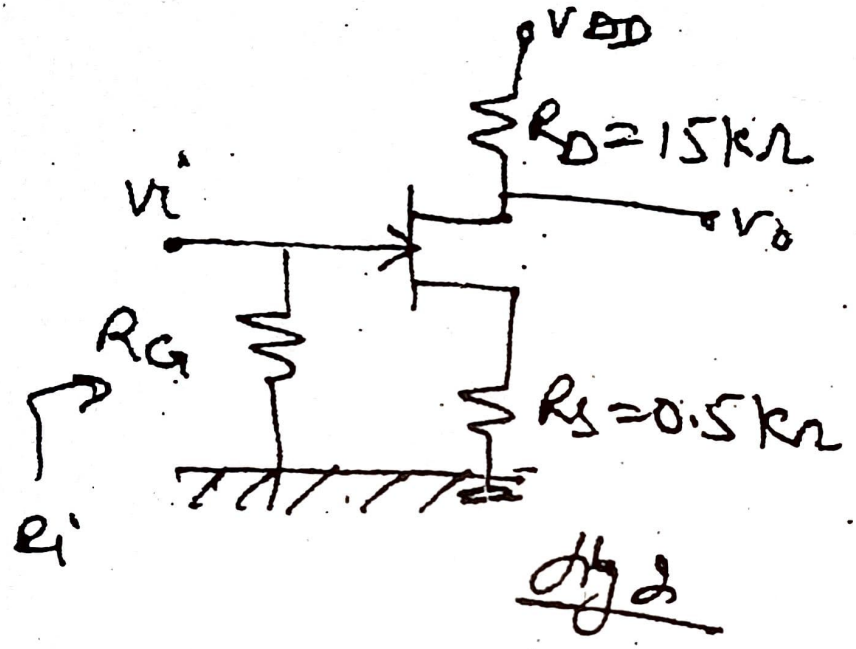
iii) Voltage divider bias with RE

Unit - III

5. a) Explain with neat diagram the characteristics of JFET. Also draw & derive for Transfer characteristics of JFET **10**

b) A C.S. FET amplifier with R_s unby passed has the following circuit parameters. **10**

$R_d = 15K\Omega, R_s = 0.5K\Omega, R_g = 1m\Omega, r_d = 5K\Omega, g_m = 5m\mho,$ $V_{DD} = 20v$ .Calculate A_V, R_i, R_0 .It is shown in fig 2



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OR

6. a) Explain with diagram, characteristics & symbol, the working of MOSFET in Enhancement mode **10**

b) Draw the low frequency model of JFET in common source configuration with R_s and derive an Expression for drain current(id), A_v, R_i, R_o with & without R_s. **10**

Unit - IV

7. a) Explain with neat diagram, derive the Expression for slew rate and CMRR. **10**

b) Derive an Expression AV_{Fo}, R_{if}, R_{of}, f_f, V_{ooT} in case of voltage shunt feedback amplifier using op-amp. **10**

OR

8. a) Explain Instrumentation amplifier and derive an Expression for output voltage **10**

b) Explain notch filter and all pass filter with waveform **10**