B.E.(with Credits)-Regular-Semester 2012-Computer Science and Engineering / Computer Technology / Electrical (Electronics & Power) Engineering Sem III

CSE/CT/EP 304 : Electronic Devices & Circuits

P. Pages : 3 **GUG/S/18/3697**

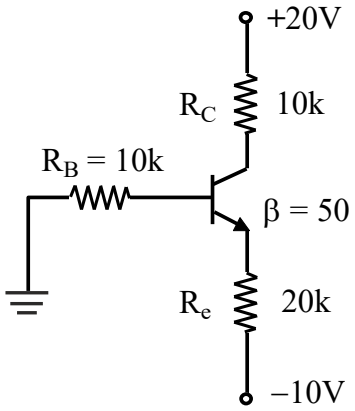
Time : Three Hours * 0 8 6 4 * Max. Marks : 80

Notes : 1. All questions carry as indicated marks.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Compare between, Half-Wave, Full-wave and Bridge Wave Rectifier ckt. **4**

b) Derive relation between α, β & γ. **4**

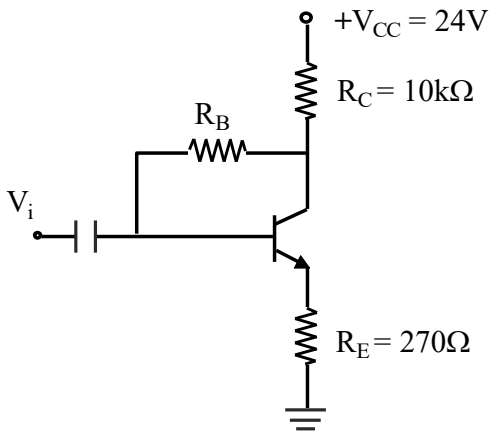
c) For the ckt shown in fig. Find I_E V_C, V_E & V_{CE} for a S_i – transistor. **8**



OR

2. a) Explain thermal run – away in power transistor? How it can be gets avoided? **4**

b) In the circuit shown the value of $V_{CC} = 24V$, $R_C = 10k\Omega$, $R_E = 270\Omega$ $\beta = 45$, $V_{CE} = 5V$ **8**
If a S_i transistor is used Find the value of R_β.



c) Explain Early effect or Base width modulation in transistors. **4**

3. a) Draw the hybrid model for C_E common emitter amplifier. Derive expression for A_I, A_v and Z_i. **8**

b) What is Bootstrapping circuit? Why are they used, explain. **8**

OR

4. a) State Miller's theorem with a circuit diagram and repeat for the dual of Miller's theorem. **8**

b) For the circuit shown below. Find A_I & A_{IS} and A_{VS}. **8**

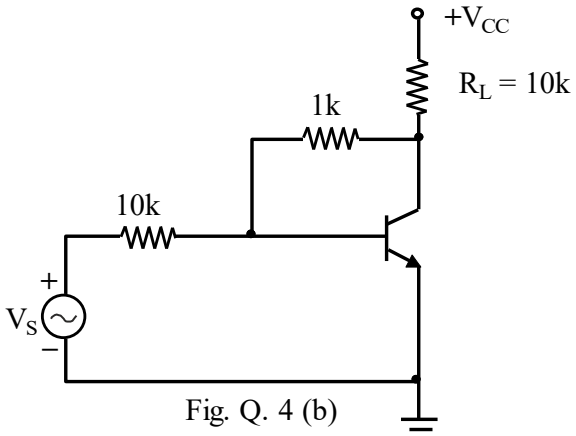


Fig. Q. 4 (b)

5. a) Draw and explain transformer coupled class A push – pull Amplifier and show that efficiency is 50%. **8**

b) The ideal class B, direct coupled push–Pull pull amplifier with $V_{CC} = 15V$, $RL = 4\Omega$ The i/p signal is sinusoidal. Determine **8**

i) Maximum o/p signal power and efficiency.

ii) What is the maximum dissipation of each transistor and what is the efficiency under this condition.

OR

6. a) Explain the cross – over distortion in power amplifiers. **8**

b) Draw and explain the working of class B push pull power amplifier. **8**

7. a) Define Negative f/b. Derive the expression for overall gain with f/b. **4**

b) Discuss the advantages and disadvantage of Negative f/b on parameters of amplifier. **4**

c) The overall gain of two – stage amplifier is 300 with – ve f/b of 25% applied to second stage. The first stage has a f/b of 10%. The second stage has a gain of 400 and 8% distortion without f/b find. **8**

i) The distortion of second stage with f/b.

ii) Gain of first stage

OR

8. a) Derive the expression for frequency of oscillations in R – C – phase – shift oscillator and obtain condition for oscillations. **8**

b) A quartz crystal has following parameter. **8**

$L = 0.05\,H \quad R = 500\,\Omega$

$C_1 = 0.02\,pf \quad C_2 = 12\,pf$

Find the values of f_s and f_p

9. a) Draw and explain mutual characteristics of JFET. **8**
Also show that for small values of V_{gs} compared to V_p, the drain current is approximated as: $I_D = I_{DSS} + g_{mo} - V_{gs}$

b) A bias ckt using FET is shown in fig. Determine quiescent values of V_{DS}, V_{gs} and I_D. **8**
given that $V_P = -5V$ & $I_{DSS} = 5mA$

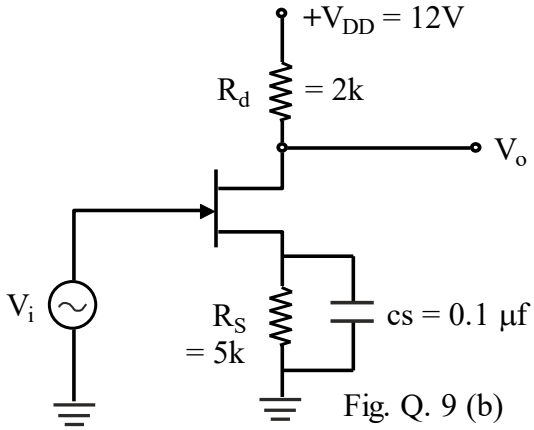


Fig. Q. 9 (b)

OR

10. a) Explain the construction and working of Depletion type MOSFET. Also draw the state and drain characteristics. **8**

b) Bring out a neat comparison between a JFET and a MOSFET. **4**

c) Discuss with aid of diagrams, the essential differences between enhancement mode FETs and depletion mode FET's. **4**

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