

( 3 Hours )

( Total Marks : 80 )

- N.B. : 1) Question No.1 is compulsory.  
 2) Attempt any three questions from the rest.  
 3) Make any suitable assumption wherever required.

- 1 Answer any four.
- |     |   |    |
|-----|---|----|
| (a) | Explain the construction and working of Schottky diode.   | 5M |
| (b) | What do you understand by 'Pinch off voltage' and 'cut off voltage' as applied to FET.  | 5M |
| (c) | Explain in brief the $r_e$ model in BJT.  | 5M |
| (d) | What is the effect of Negative feedback on bandwidth and overall gain?  | 5M |
| (e) | Find frequency of oscillations for Colpitt's oscillator with $C_1 = 0.01\mu\text{F}$ , $C_2 = 0.001\mu\text{F}$ & $L = 5\text{ mH}$ | 5M |
- 2 (a) Derive the expression for ripple factor for Full Wave Bridge Rectifier with LC filter. 10M  
 (b) Compare different biasing methods of BJT and calculate the values of  $I_{BQ}$ ,  $I_{CQ}$  &  $V_{CEQ}$  for the following fig. 1 shown of silicon transistor with  $\beta = 100$ . 10M

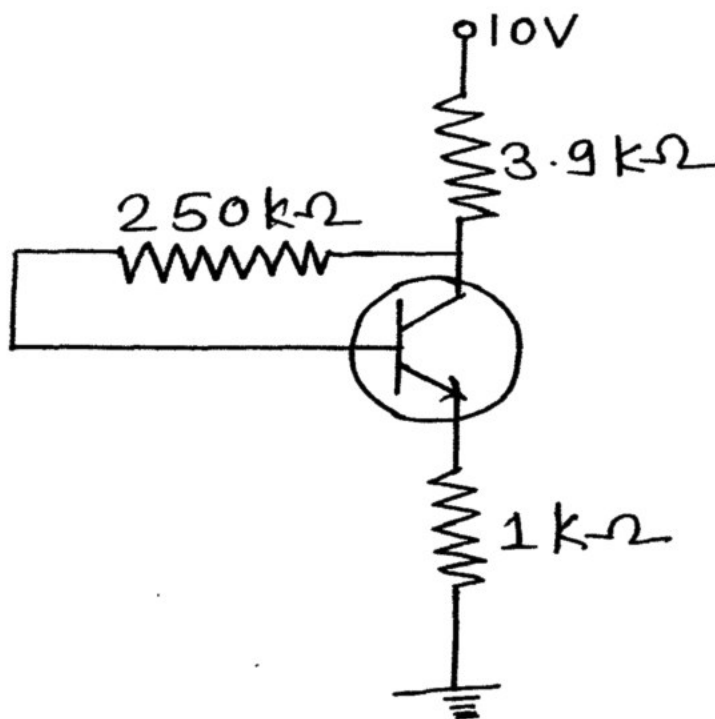


Fig .1

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- 3 (a) Draw & explain E-type MOSFET in detail with its input & output characteristic. 10M
- (b) For the circuit shown in fig.2 determine voltage gain, input impedance and output impedance. FET has  $I_{DSS} = 10\text{mA}$  and  $V_P = -4.5\text{V}$ .

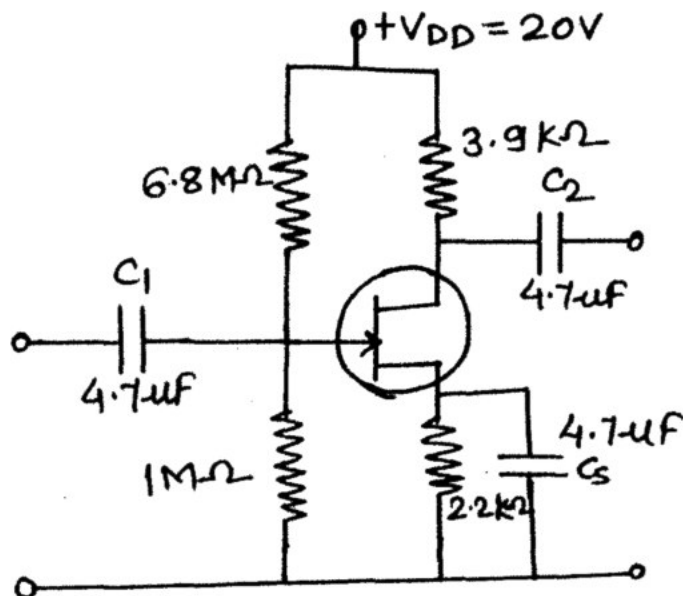


Fig. 2

- 4 (a) Draw and explain Hartley oscillator and derive an expression for its frequency of oscillation. 10M
- (b) What are the advantages of negative feedback? 5M
- (c) Explain in brief various types of negative feedback amplifiers. 5M
- 5 (a) Explain the features of multistage RC coupled amplifier. Draw and explain two stage RC coupled transistor amplifier 10M
- (b) Derive the expression for stability factor (S) for voltage divider biasing in transistor. 10M
- 6 (a) Write short note on frequency response of BJT amplifier. 10M
- (b) Write short note on different types of filter circuits used to remove the ripple in rectifier output. Derive the ripple factors for each. 10M