

(b) Answer the following :

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- (1) Draw output waveform of the circuit given in fig. 1 consider input of 20 V. (peak to peak), 10 KHz sine wave and assume ideal diode.

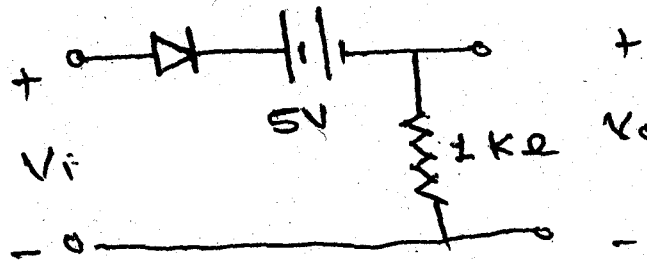


Fig. 1

- (2) State the regions of operation of transistor and explain the biasing condition for the three regions.

- 2 (a) Draw and explain the input and output characteristics of CB connection. What do you infer from these characteristics ? 8
- (b) In the centre-tap rectifier circuit shown in figure 2. The diodes are assumed to be ideal. Find : 7
- (i) DC output voltage and current.
 - (ii) PIV
 - (iii) Rectification efficiency

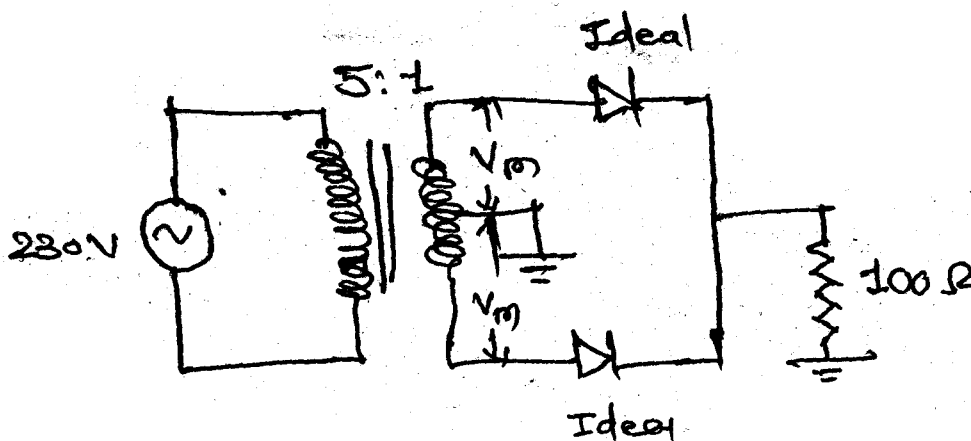


Fig. 2

OR

- 2 (a) Draw and explain circuit diagram of a bridge rectifier with necessary waveforms and derive the expressions for average load voltage and rectifier efficiency. 8

- (b) Calculate the values of I_E , β and α for a transistor with $I_C = 12.427 \mu A$, $I_B = 200 \mu A$, $I_{CBO} = 7 \mu A$. Also determine the new level of I_C which will result from reducing I_B to $150 \mu A$. 7
- 3** Write short notes on : (any **three**) **15**
- (1) Fixed biased circuit
 - (2) Half wave rectifier with capacitor filter.
 - (3) DC and AC load line of diode
 - (4) Transistor as an amplifier.
 - (5) Common collector (CC) configuration of transistor.
- 4** (a) Answer the following : **10**
- (1) The parameter h_{re} is called _____ in CE arrangement with input open circuit.
 - (2) What is the need of biasing ?
 - (3) The full name of JFET is _____.
 - (4) The unit of h_{11} is _____ and h_{22} is _____.
 - (5) The reverse saturation current I_{cbo} approximately doubles for every _____.
 - (6) Define Amplification.
 - (7) True/False: The maximum efficiency of class A power amplifier is 25%.
 - (8) The point of intersection of ac and dc load line is the _____.
 - (9) True / False : In class - C amplifier, Q point is well beyond the cut off region.
 - (10) True / False : BJT is voltage controlled device.
- (b) (1) Explain quiescent point variation due to uncertainty in β . 8
- (2) Explain by graphical method how h_{oe} and h_{fe} parameters are obtained. 2

- 5 (a) Explain working of class - B push-pull power amplifier. Draw AC and DC load line 8
- (b) A loud speaker rated at $8\ \Omega$ and $500\ \text{mw}$ is to be driven by a class - B push-pull amplifier. The power supply is $9\ \text{V}$. The transistor have $V_{CE\ \text{sat}}$ is $1\ \text{V}$. Select a suitable value of N and find P_{cc} and P_c . Also find efficiency. 7

OR

- (b) In figure the BJT has $h_{fe} = 50$ All by pass and coupling capacitors are assumed to have zero reactance at the signal frequency. Find : 7
- (a) quiescent condition (b) The small signal equivalent circuit neglecting h_{oe} , h_{re} (c) A_i (d) Z_i (e) Z_0 .

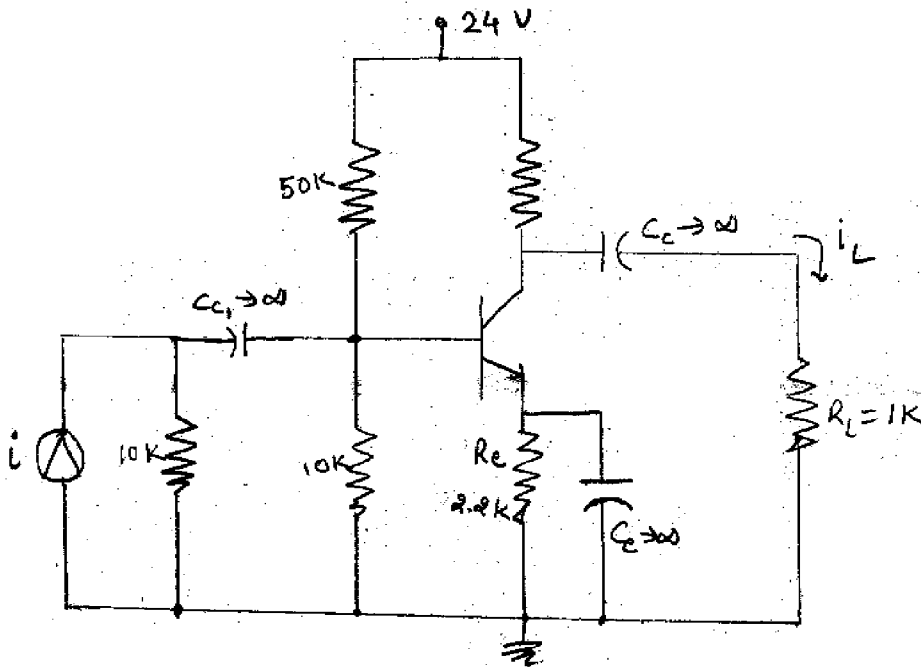


Fig. 3

- 6 Attempt any two 15
- (1) Temperature compensation using diodes
 - (2) Impedence reflection in the transistor
 - (3) Compare BJT and FET classify FET devicer.
 - (4) Construction of p-channel FET.