JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

B.Tech-III Semester (ECE)

COURSE CODE (CREDITS): 18B11EC313 (4) MAX. MARKS: 25

COURSE NAME: ELECTRONIC DEVICES AND CIRCUITS

COURSE INSTRUCTORS: Dr. Shruti Jain MAX. TIME: 1 Hour 30 Minutes

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	i. What is the meaning of symbols I_{CEO} and I_{CBO}? ii. The maximum swing of signals occurs when Q point along load line is selected at _____ iii. Explain Shyam the doping of the transistor terminals. iv. Show different regions on output characteristics curve of a BJT. v. Which of the transistor current show maximum value? Give relation among three currents.	CO-2	5
Q2	i. The collector and base currents of BC 107 transistor are 5mA and 50μA respectively. If current amplification factor in common base configuration is 0.98, calculate the value of leakage current in CE and CB configurations. ii. If base current and collector current of any BJT are 1mA and 100mA respectively, determine its current amplification ratio in CB and CE configurations.	CO-2	2 +2
Q3	i. Calculate the value of the base emitter voltage for an NPN transistor having $\beta = 100$, $I_C = 1$mA, and $I_S = 10^{-11}$A. ii. Explain Sita how is the DC load line plotted on the output characteristic of BJT?	CO-2	2 + 2
Q4	i. A transistor amplifier circuit is shown in Fig 1. Draw the dc load line and locate the Q point on the dc load line.	CO-3	2 + 2

	(assume $V_{BE} = 0.7V$ and $\beta = 50$) ii. What is the hybrid parameter model of a BJT, and how is it used to analyze CE transistor circuits?		
Q5	i. Explain Riya about the requirements for biasing in a transistor? Briefly explain all biasings to her. ii. Explain Gita, the switching operation of a BJT.	CO- 3	3 + 1
Q6	i. The voltage divider bias circuit of an NPN transistor is shown in Fig 2. Calculate the values of R_1 and R_C when collector current is 1 mA and collector to emitter voltage is 2.6V. Assume V_{BE} = 0.65V and $\beta = 100$. ii. What do you mean by the distortion output in amplifiers? Explain how you can obtain an undistorted output of an amplifier?	CO-3	3 + 1

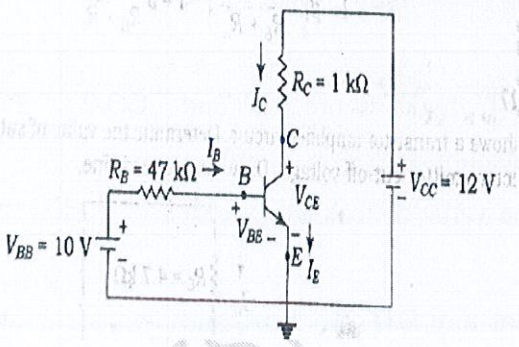

Fig 1

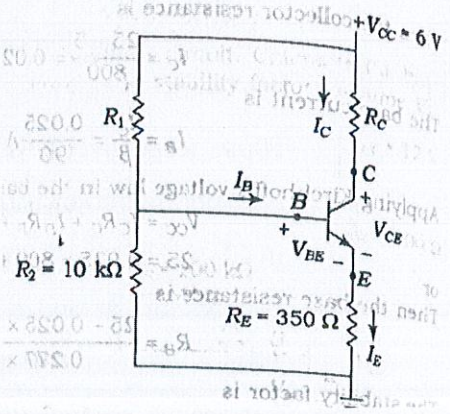

Fig 2