DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular & Supplementary Winter Examination-2023

Course: B. Tech.   Semester :III

Branch :Electronics Engineering/Electronics and Telecommunication

Engineering/Electronics and Communication Engineering

Subject Code & Name: BTEXC302/BTETC302 and Electronic Devices and Circuits

Max Marks: 60   Date:04-01-2024   Duration: 3 Hr.

Instructions to the Students:
1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

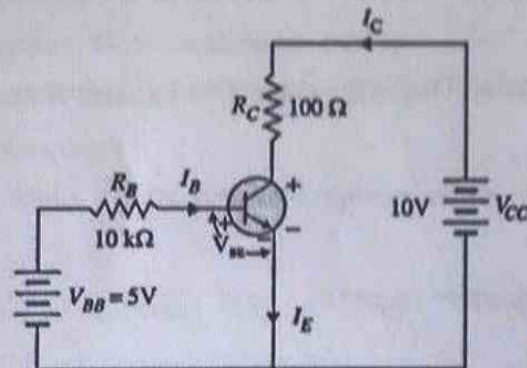|		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Draw a neat circuit diagram of CB connection. Define α. Find the expression for collector current.	CO3	6
B)	Explain transistor as an amplifier in CE configuration.	CO3	6
C)	Determine V_{CB} in the transistor circuit shown in figure (a). The transistor if silicon and has $\beta = 150$.	CO2/CO3	6

Figure (a)

Q.2	**Solve Any Two of the following.**		**12**
A)	With a neat diagram, explain the working principle of p-channel D-MOSFET with different cases.	CO2/CO3	6
B)	Give the comparison of FET with MOSFET and BJT.	CO3	6
C)	A JFET has a drain current of 5mA. If I_{DSS} = 10mA and $V_{GS (off)}$ = -6V, find the value of (i) V_{GS} and (ii) V_P.	CO3	6

Q. 3 Solve Any Two of the following. 12

A) Discuss with neat diagram transformer coupled class A power amplifier and derive its maximum efficiency.   CO2/CO4   6

B) Prove that the maximum conversion efficiency of a Class B transformer coupled amplifier is 78.5%.   CO2/CO4   6

C) With a neat diagram explain push-pull class B power amplifier and derive its maximum efficiency.   CO1/CO4   6

Q.4 Solve Any Two of the following. 12

A) Explain voltage series feedback amplifier with a neat diagram. How the overall gain, input impedance, output impedance is affected in these amplifiers.   CO4   6

B) Explain current series feedback amplifier with a neat diagram. How the input impedance, output impedance are affected in these amplifiers.   CO2/CO4   6

C) State and explain Barkhausen criterion of oscillations.   CO4   6

Q. 5 Solve Any Two of the following. 12

A) Draw and explain the Wein Bridge oscillator. Derive the expression for frequency of oscillation.   CO2/CO4   6

B) Draw and explain the Hartley oscillator. Derive the expression for frequency of oscillation.   CO2/CO4   6

C) Define voltage regulation. Explain series voltage regulator with a block diagram.   CO4   6

*** End ***