

1903000203020091 / 1911000303020091
EXAMINATION FEBRUARY-MARCH 2024
BACHELOR OF SCIENCE (THIRD SEMESTER)
ELECTRONICS PAPER – III
ELECTRONIC CIRCUITS & APPLICATIONS

[Time: As Per Schedule]

[Max. Marks: 50]

Instructions:

1. Fill up strictly the following details on your answer book

- a. Name of the Examination : **BACHELOR OF SCIENCE (ELECTRONICS) (THIRD SEMESTER)**
 - b. Name of the Subject : **ELECTRONICS PAPER – III ELECTRONIC CIRCUITS & APPLICATIONS**
 - c. Subject Code No : **1903000203020091 / 1911000303020091**
2. Sketch neat and labelled diagram wherever necessary.
 3. Figures to the right indicate full marks of the question.
 4. All questions are compulsory.
 5. All symbols and abbreviations have their usual meaning.
 6. Non-programmable calculators are allowed.
 7. Q.1 is compulsory.
 8. Assume data if necessary.

Seat No:

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Student's Signature

Q.1 Write the answer briefly

8

1. Why does the gain of a CE amplifier decrease in high frequency regions?
2. What is the use of emitter follower?
3. Define stability factor
4. What is the need of biasing in amplifiers?

Q.2

- A. Derive the expression for operating point in emitter bias circuit **7**
- B. Determine the following for emitter bias configuration with $R_B = 430k\Omega$, $R_C = 2k\Omega$, $R_E = 1k\Omega$, $\beta = 50$ and $V_{CC} = 12V$. I_{BQ} , I_{CQ} , V_{CEQ} and S **7**

OR

- A. Derive the expression for stability factor in potential divider bias circuit **7**
- B. Design a voltage divider bias circuit for the following data. $I_{CQ} = 8mA$, $\beta = 80$, $V_{CEQ} = 8V$, $V_{CC} = 16V$. **7**

- Q.3**
- A. Draw the approximate hybrid model of transistor. Using this model analyze CB amplifiers. 7
 - B. Explain how will you calculate h-parameters from the characteristics of transistor 7

OR

- A. Derive the amplifier equations for A_v , A_i and R_i in terms of h-parameters 7
- B. Explain briefly Bias compensation techniques 7

- Q.4**
- A. By drawing the schematic and ac equivalent diagram of RC coupled amplifier, prove that the voltage gain in the low frequency range is a function of frequency 7
 - B. Prove that $S = (\beta+1) / [1-\beta (dI_B/dI_C)]$. 7

OR

- A. Describe the working of FET. Explain FET as a VVR. 7
- B. The device parameters for N channel FET are: Maximum drain current (I_{DSS}) = 10mA, pinch-off voltage $V_p = -4V$. calculate the drain current for
 - 1. $V_{GS}=0V$
 - 2. $V_{GS}= -1V$
 - 3. $V_{GS}= -4V$
