

Question Paper

Exam Date & Time: 01-Feb-2023 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

**INTERNATIONAL CENTRE FOR APPLIED SCIENCES
END SEMESTER THEORY EXAMINATION - DECEMBER 2022**

III SEMESTER B.Sc (Applied Sciences) in Engg.

ANALOG ELECTRONIC CIRCUITS [IEC 231]

Marks: 50

Duration: 180 mins.

Answer all the questions.

Missing data may be suitably assumed.

- 1) Draw and explain the circuit diagram of common emitter configuration using NPN transistor. Plot the input and output characteristics. Indicate cut-off, saturation, and active regions. (5)
 - A)
 - B) Define α_{dc} and β_{dc} of a transistor. Write the expressions for α_{dc} and β_{dc} . Calculate the value of collector current, α_{dc} and β_{dc} , if $I_B=200\mu A$, $I_{CBO}=20\mu A$ and $I_{CEO}=0.5mA$. (3)
 - C) With the help of a circuit diagram explain how a transistor (BJT) can be used as a switch. Illustrate with the example of a square wave of amplitude 5V applied to the base. (2)
- 2) (5)
- A)

Determine I_B , I_C , I_E , V_{CE} , V_B , V_C and V_E for the voltage divider configuration