Kingdom of Saudi Arabia
Ministry of Education
College of Computer
Department of Computer Engineering

Course Code and Name: Electronics COE213
Mid Exam
472 Date: 22-4-2026 Duration:1hour

Student Name:	Student ID:

The exam starts here

Question 1 (5 marks) **:**
Choose the correct answer

1) Semiconductor materials have a temperature coefficient that is:
a) Positive
b) Negative
c) Zero
d) Undefined

2) Donor impurities increase the number of:
a) Holes
b) Free electrons
c) Ions
d) Neutral atoms

3) The knee voltage for a silicon diode is approximately:
a) 0.3 V
b) 0.7 V
c) 1.2 V
d) 5 V

4) The breakdown region in a diode's characteristic curve occurs at:
a) High forward bias
b) High reverse bias
c) Zero voltage
d) Low reverse current

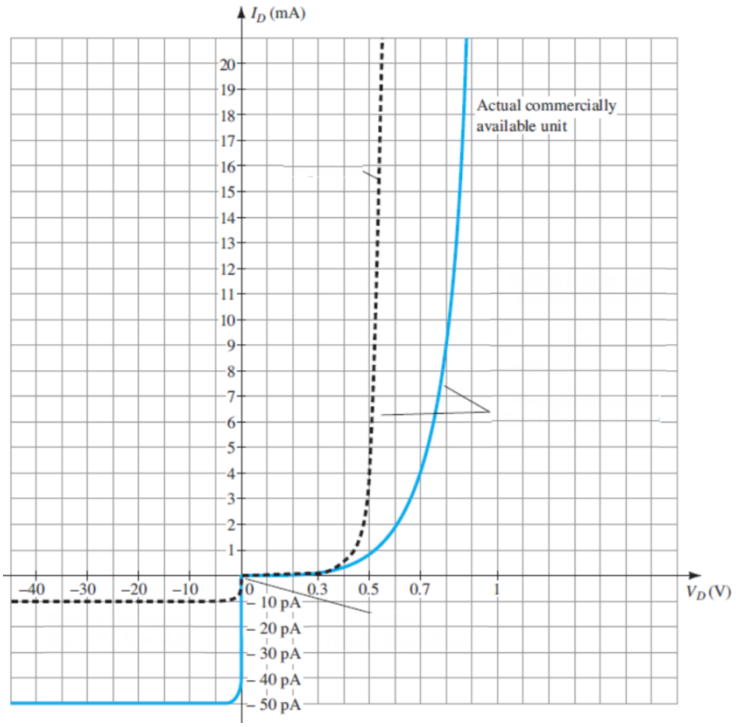
5) The dynamic (AC) resistance is approximately calculated as:
a) $rD = \frac{26\,mV}{I_d}$
b) $rD = \frac{I_d}{26mV}$
c) $rD = \frac{V_D}{I_D}$
d) $rD = \frac{\Delta V_d}{\Delta I_d}$

Question 2 (5 marks) **:**

a) Determine the static or DC resistance of the commercially available diode of Figure at a forward current of 9mA ?

b) Determine the static or DC resistance of the commercially available diode of Figure at a reverse voltage of -20V ?

c) Determine the dynamic (AC) resistance of the diode of Figure at a forward voltage of 0.7V
using Eq. $rD = \frac{\mathbf{26\ mV}}{\boldsymbol{I_d}}$

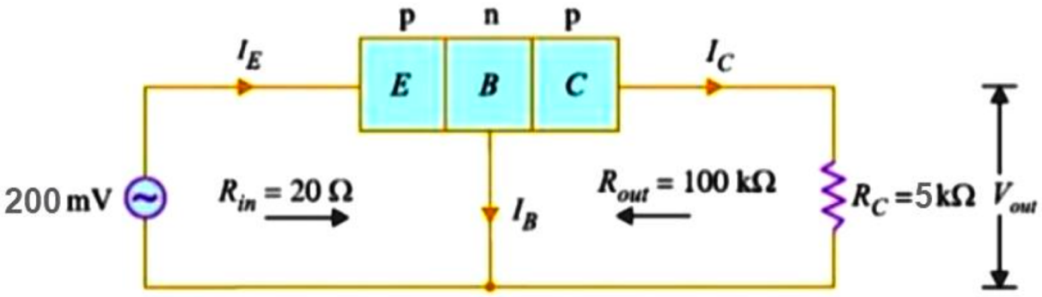


Question 3 (5 marks) **:**

In the common-base amplifier shown in the figure, the input signal is V_i= 200mV. **The input resistance is** R_i = 20, **the output resistance is** R_o = 100k, **and the load resistance is** R_L = 5 ,

Assuming $I_C \approx I_E$, **calculate:**

- The emitter current I_E
- The load current I_L
- The load voltage V_L
- The voltage gain A_V



Question 4 (5 marks) **:**

Sketch V_o for each network of Figure for the input shown.

