

# CBCS SCHEME

USN

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BBEE103/203

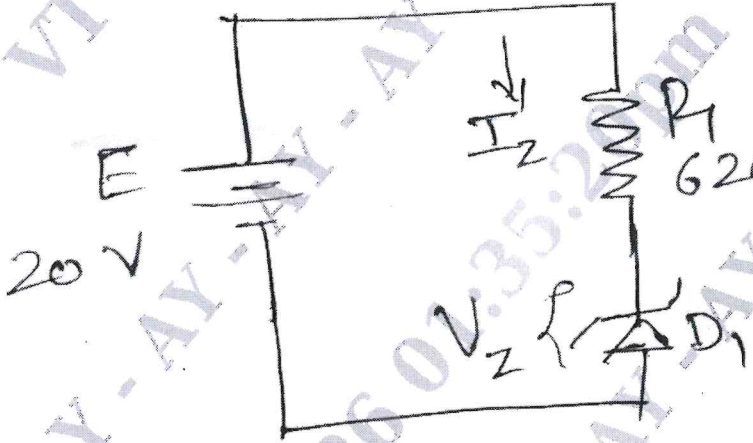
First/Second Semester B.E./B.Tech. Degree Examination, June / July 2026

## Basic Electronics for EEE Stream

Time: \_\_\_\_\_ hrs.

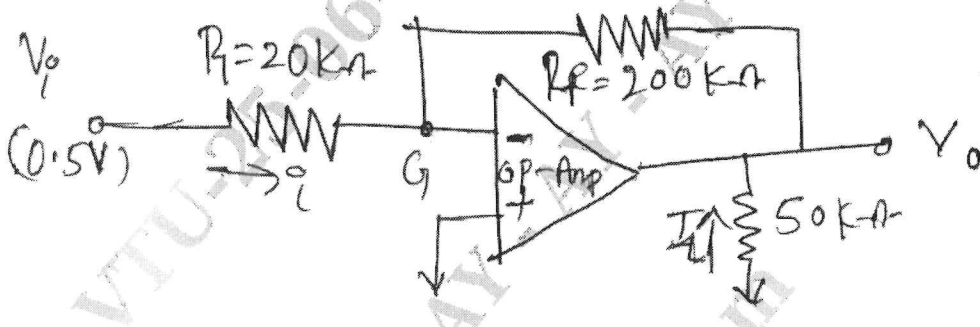
Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. M : Marks , L: Bloom's level , C: Course outcomes.

| Module – 1                                                                           |    |                                                                                                                                                                    | M  | L  | C   |
|--------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|-----|
| Q.1                                                                                  | a. | With a neat sketch of VI characteristics of PN junction diode, explain forward and reverse characteristics of it.                                                  | 07 | L2 | CO1 |
|                                                                                      | b. | Determine the peak output voltage and current for the bridge rectifier having $V_i = 30V$ $R_L = 300 \Omega$ and the diode having voltage of $V_F = 0.7 V$ .       | 06 | L2 | CO1 |
|                                                                                      | c. | Explain Zener diode voltage Regulator with and without load.                                                                                                       | 07 | L2 | CO1 |
| OR                                                                                   |    |                                                                                                                                                                    |    |    |     |
| Q.2                                                                                  | a. | Discuss the different types of junction breakdown that can occur in a reverse biased diode and briefly explain its operation.                                      | 06 | L2 | CO1 |
|                                                                                      | b. | The Zener diode circuit shown in figure Q2(b) , has $E = 20 V$ $R_1 = 620 \Omega$ and zener diode $V_Z = 7.5 V$ calculate the diode current and power dissipation. | 06 | L3 | CO1 |
|  |    |                                                                                                                                                                    |    |    |     |
| Fig.Q 2 (b)                                                                          |    |                                                                                                                                                                    |    |    |     |
|                                                                                      | c. | Describe the working of full wave rectifier, with a neat circuit diagram and necessary waveforms.                                                                  | 08 | L2 | CO1 |
| Module – 2                                                                           |    |                                                                                                                                                                    |    |    |     |
| Q.3                                                                                  | a. | Explain the output characteristics of a transistor in common Emitter configuration.                                                                                | 06 | L2 | CO2 |
|                                                                                      | b. | With a neat diagram, explain the construction working and characteristics of N – channel JFET.                                                                     | 08 | L2 | CO2 |
|                                                                                      | c. | Calculate $I_C$ & $I_E$ for a transistor that has $\alpha_{dc} = 0.98$ and $I_B = 100 \mu A$ . Also determine the value of $\beta_{dc}$ for the transistor.        | 06 | L3 | CO2 |
| OR                                                                                   |    |                                                                                                                                                                    |    |    |     |
| Q.4                                                                                  | a. | Explain the enhancement type MOSFET along with the drain characteristics.                                                                                          | 08 | L2 | CO3 |
|                                                                                      | b. | Discuss the common Emitter input and output characteristics.                                                                                                       | 06 | L2 | CO3 |
|                                                                                      | c. | Draw the DC Load line for transistor and identify Q points.                                                                                                        | 06 | L2 | CO3 |

1 of 3

## Module – 3

|     |    |                                                                                                                                                                                                                                                                                                                                     |    |    |     |
|-----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|-----|
| Q.5 | a. | Define the terms with respect to Op – Amp<br>i) Slew rate<br>ii) CMRR<br>iii) SVRR<br>iv) Common mode gain $A_{cm}$<br>v) Virtual ground<br>vi) Offset voltage<br>vii) Bandwidth                                                                                                                                                    | 07 | L2 | CO2 |
|     | b. | An inverting Amplifier shown in fig.Q.5 (b) below has a load resistor of $50\text{ K}\Omega$ connected to its outputs. If the input voltage is $0.5\text{ V}$ , find the load current, output voltage and input currents.<br><br><br>Fig.Q 5 (b) | 06 | L3 | CO2 |
|     | c. | Explain the operation of an Op-Amp as inverting Amplifier with neat diagram and waveforms.                                                                                                                                                                                                                                          | 07 | L2 | CO2 |

## OR

|     |    |                                                                               |    |    |     |
|-----|----|-------------------------------------------------------------------------------|----|----|-----|
| Q.6 | a. | Explain how Op-Amp can be used as :<br>i) Integrator<br>ii) Voltage follower. | 08 | L2 | CO2 |
|     | b. | What is an Op-Amp? List the characteristics of an ideal Op – Amp.             | 06 | L2 | CO2 |
|     | c. | With a neat block diagram explain the Operational Amplifier.                  | 06 | L2 | CO2 |

## Module – 4

|     |    |                                                                                                                                                                                     |    |    |     |
|-----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|-----|
| Q.7 | a. | State and prove DC - Morgan's theorem using suitable Truth table.                                                                                                                   | 04 | L2 | CO4 |
|     | b. | i) Perform the following using 1's complement<br>a) $1111 - 1011$ b) $110011 - 100101$<br><br>ii) Perform the following using 2's complement<br>a) $10111 - 10011$ b) $1101 - 1001$ | 08 | L3 | CO4 |
|     | c. | Design full circuit, write expression for sum and carry with suitable truth table.                                                                                                  | 08 | L2 | CO4 |

OR

|            |    |                                                                                                                                                                                                                                                                                                                                                                                              |    |    |     |
|------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|-----|
| Q.8        | a. | Perform the following operations.<br>i) $(ABCD)_{16} = ( )_2 = ( )_8$<br>ii) $(IC00)_{16} = ( )_8$<br>iii) $(532.65)_{10} = ( )_{16} = ( )_2$<br>iv) $(B4D)_{16} = ( )_2$<br>v) $(7AF4)_{16} = ( )_2$<br>vi) $(11010.01101)_2 = ( )_{16}$                                                                                                                                                    | 08 | L3 | CO4 |
|            | b. | Simplify the following using Boolean Algebra.<br>i) $Y = \overline{A} \overline{B} \overline{C} + \overline{A} B \overline{C} + A \overline{B} \overline{C}$<br>ii) $Y = \overline{A} \overline{B} \overline{C} + \overline{A} B \overline{C} + A \overline{B} \overline{C} + A B \overline{C}$<br>iii) $Y = (A + B) (A + \overline{B}) (\overline{A} + B)$<br>iv) $Y = A \oplus B \oplus C$ | 08 | L3 | CO4 |
|            | c. | Write the symbol and truth table of the following gates :<br>i) AND<br>ii) NOR<br>iii) XOR<br>iv) NAND                                                                                                                                                                                                                                                                                       | 04 | L2 | CO4 |
| Module – 5 |    |                                                                                                                                                                                                                                                                                                                                                                                              |    |    |     |
| Q.9        | a. | What is modulation? Explain the need for modulation.                                                                                                                                                                                                                                                                                                                                         | 06 | L2 | CO5 |
|            | b. | Explain the working of Linear Variable Differential Transducer (LVDT).                                                                                                                                                                                                                                                                                                                       | 08 | L2 | CO5 |
|            | c. | Write a note on Piezoelectric Transducer.                                                                                                                                                                                                                                                                                                                                                    | 06 | L2 | CO5 |
| OR         |    |                                                                                                                                                                                                                                                                                                                                                                                              |    |    |     |
| Q.10       | a. | Explain the various blocks involved in an electrical communication system.                                                                                                                                                                                                                                                                                                                   | 06 | L2 | CO5 |
|            | b. | Explain the working of the Potentiometric Resistive Transducer.                                                                                                                                                                                                                                                                                                                              | 08 | L2 | CO5 |
|            | c. | Differentiate between AM and FM.                                                                                                                                                                                                                                                                                                                                                             | 06 | L2 | CO5 |

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