

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2025**

**BASIC ELECTRONICS**

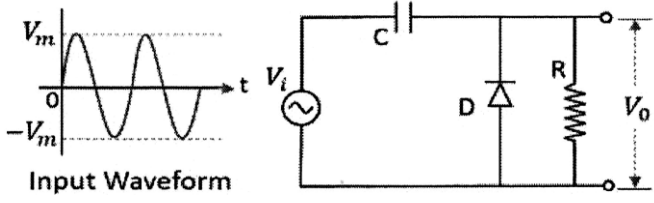
[Maximum Marks: 75]

[Time: 3 Hours]

**PART-A**

**I. Answer 'all' the following questions in one word or one sentence. Each question carries 'one' mark.**

**(9 x 1 = 9 Marks)**

		Module Outcome	Cognitive level
1.	The forbidden energy gap for Silicon is..... and that for Germanium is.....	M1.01	R
2.	Define breakdown voltage for a PN junction.	M1.03	R
3.	Define PIV for a diode.	M1.04	R
4.	.....is the heavily doped region in an NPN transistor.	M2.01	R
5.	The leakage current $I_{CBO}$ flows between.....and.....leads	M2.03	U
6.	Why FET is termed as unipolar device?	M3.01	R
7.	.....and..... are the typical range of values of intrinsic stand-off ratio in UJT.	M3.02	R
8.	 <p>Input Waveform</p> <p>Making use of the above circuit for input voltage draw the output waveform. Assume diode to be ideal.</p>	M4.04	A
9.	The criteria for a good differentiator circuit is that the time constant RC should be.....with respect to T.	M4.02	R

**PART-B**

**II. Answer any 'eight' questions from the following. Each question carries 'three' marks.**

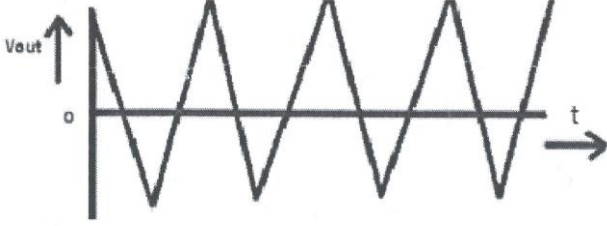
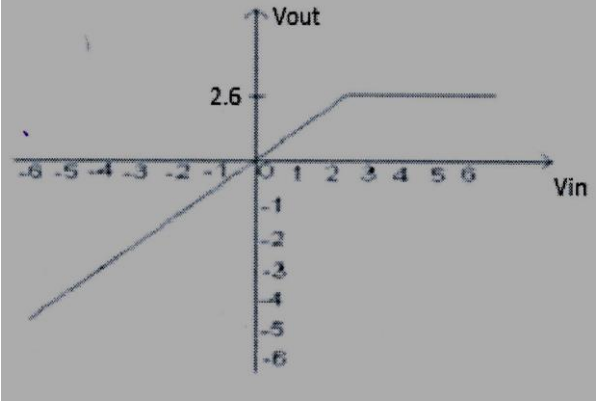
**(8 x 3 = 24 Marks)**

		Module Outcome	Cognitive level
1.	Summarize the carrier generation process occurring in intrinsic semiconductor by thermal energy.	M1.01	U
2.	Explain reverse breakdown voltage and Knee voltage of a PN junction.	M1.03	U
3.	Compare static and dynamic resistance of a PN junction diode.	M1.03	U
4.	CE configuration is widely used in amplifier circuits. Why?	M2.04	U
5.	Explain the construction of N-channel JFET with diagram.	M3.01	U
6.	Draw the transfer characteristics of N-channel depletion type MOSFET.	M3.03	U
7.	Draw and explain how to represent UJT into its equivalent circuit.	M3.01	U
8.	Explain the operation of N-channel MOSFET in depletion mode with a neat sketch.	M3.02	U
9.	Compare and list BJT and FET.	M3.04	U
10.	What is the need of filter circuits in rectifiers?	M4.02	R

## PART-C

Answer 'all' questions from the following. Each question carries 'seven' marks.

(6 x 7 = 42 Marks)

		Module Outcome	Cognitive level
III.	Plot and explain the V-I characteristics of PN junction diode. <b>OR</b>	M1.03	U
IV.	Illustrate the formation of P-type semiconductor with appropriate diagram.	M1.01	U
V.	Outline the structure of NPN transistor and explain the working with proper biasing. <b>OR</b>	M2.01	U
VI.	Draw and explain the input and output characteristics of NPN transistor in CE configuration	M2.04	U
VII.	i) Derive the relation between $\alpha$ and $\beta$ (4marks) ii) A transistor has $\beta = 150$ , Find out current gain $\alpha$ , collector and base currents if emitter current is 10mA (3marks) <b>OR</b>	M2.03	U
VIII.	Draw the circuit and explain the working of transistor as an amplifier.	M2.05	U
IX.	Illustrate the drain characteristics of JFET with circuit diagram. <b>OR</b>	M3.03	U
X.	Draw and explain the V-I characteristics of UJT.	M3.03	U
XI.	 <p>Develop a waveshaping circuit to obtain the above output signal with square wave as input and explain the working. <b>OR</b></p>	M4.03	A
XII.	 <p>Build the circuit and waveforms for the given transfer characteristics, explain the working.</p>	M4.04	A
XIII.	Explain the working of $\pi$ filter circuit utilising full wave rectified wave as the input. <b>OR</b>	M4.02	U
XIV.	Explain the working of full wave voltage doubler with circuit diagram.	M4.05	U

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