

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, APRIL - 2024**

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

		Module outcome	Cognitive level
1	Name any two donor impurities.	M1.01	R
2	Define Peak Inverse Voltage of a diode.	M1.04	R
3	Define the term α of a transistor.	M2.03	R
4	Which mode of operation of a transistor makes it equivalent to a closed switch?	M2.04	R
5	Draw the symbol of N channel depletion type MOSFET.	M3.01	R
6	Why JFET is considered as a voltage controlled device?	M3.02	R
7	Draw the simplified equivalent circuit of a UJT.	M3.01	R
8	Which circuit transforms a triangular wave in to a square wave?	M4.04	R
9	Write the value of ripple factor of a half wave rectifier.	M4.01	R

PART B

II. Answer any eight questions from the following. Each question carries 3 marks.

(8 x 3 = 24 Marks)

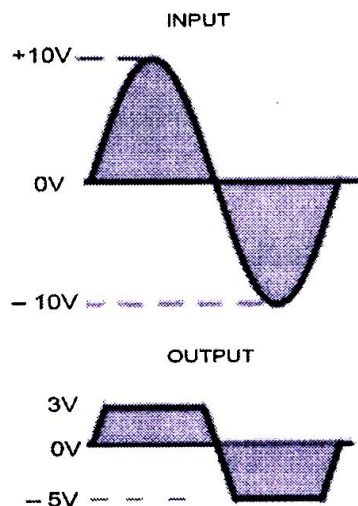
		Module outcome	Cognitive level
1	Explain the energy band diagram of a semiconductor with a diagram.	M1.01	U
2	Define static resistance, dynamic resistance and knee voltage of a diode.	M1.03	R
3	Explain zener breakdown.	M1.03	U
4	Define forward voltage drop, power rating and reverse saturation current of a diode.	M1.04	R
5	Derive the relation between α and β of a transistor.	M2.03	U
6	Explain the pinch off voltage of a JFET.	M3.02	U
7	Outline the transfer characteristics of depletion type N channel MOSFET.	M3.03	U
8	Explain the working of UJT with reference to its structure.	M3.02	U
9	Compare BJT with FET.	M3.04	U
10	Draw an RC circuit to obtain a spike waveform from a square wave input. Relate output wave with input wave diagrammatically.	M4.03	U

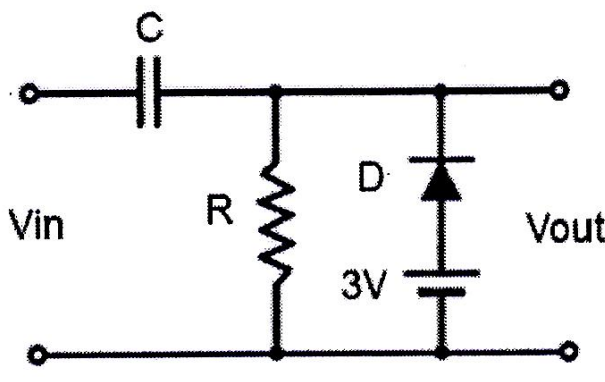
PART C

Answer all questions. Each question carries seven marks

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III	Summarize the steps involved in the formation of P type and N type semiconductors from an intrinsic semiconductor with diagrams.	M1.01	U
	OR		
IV	Explain the principle of operation of PN junction diode and draw the V – I characteristics.	M1.03	U
V	Explain the output characteristics of CE configuration of NPN transistor and mark active, saturation and cut off regions.	M2.04	U
	OR		
VI	Explain transistor action as an amplifier with a diagram.	M2.05	U
VII	Compare the CB, CE and CC transistor configurations.	M2.03	U
	OR		
VIII	Draw the CB configuration and input characteristics of an NPN transistor. Explain the characteristics for various V_{CB} .	M2.04	U
IX	Outline the drain characteristics of N channel JFET and explain the operating regions.	M3.03	U
	OR		
X	Outline the structure of N channel depletion type MOSFET and explain the working principle.	M3.01	U
XI	Illustrate the operation of a series inductor filter with diagram and waveform.	M4.02	U
	OR		
XII	Explain the operation of a half wave voltage doubler with a circuit diagram.	M4.05	U
XIII	Construct a diode circuit to realise the given output waveform from the given input. Explain the working of the circuit. (Assume that the diode is ideal)	M4.04	A



XIV	<p style="text-align: center;">OR</p> <p>Model the output waveform for the given circuit if the input V_{in} is a square wave with peak amplitude V_1. Explain the working of the circuit and outline the input and output waveforms. (Assume that the diode is ideal)</p> 	M4.04	A
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