USN ☐☐☐☐☐☐☐☐☐☐ **Course Code** | 2 | 2 | B | E | E | 13 | / | 23 |

First/Second Semester B.E. Degree Summer Semester Examinations, September/October 2025
BASIC ELECTRONICS

Duration: 3 hrs   **Max. Marks: 100**

Note: *1. Answer any **FIVE** full questions, choosing **ONE** full question from each module.*
2. Missing data, if any, may be suitably assumed.

Q. No	*Question*	*Marks*	*(RBTL:CO:PI)*

Module-1

1. a.	With a neat circuit diagram and waveform, explain the operation of full-wave centre-tapped rectifier.	**06**	**(2:1:1.3.1)**
b.	With relevant equations explain DC-load line analysis of a diode.	**06**	**(2:1:1.3.1)**
c.	What is PN junction? Explain PN junction diode under forward biased and reverse biased condition.	**08**	**(2:1:1.3.1)**

(OR)

2. a.	Explain the working of DC power supply with a neat block diagram.	**06**	**(2:1:1.3.1)**
b.	Explain how Zener diode can be used as a voltage regulator with a load.	**06**	**(2:1:1.3.1)**
c.	Describe the working of a RC-π filter for a full wave rectifier with neat diagram and necessary waveforms.	**08**	**(2:1:1.3.1)**

Module-2

3. a.	List out the difference between Common Emitter (CE), Common Collector (CB), and Common Collector (CC) configuration modes of a transistors.	**06**	**(2:2:1.3.1)**
b.	Explain Common Emitter configuration of NPN transistor with a neat diagram.	**06**	**(2:2:1.3.1)**
c.	Define BJT. Give Symbol and layer diagram of NPN and PNP Transistor with its terminal voltages and currents.	**08**	**(2:2:1.3.1)**

(OR)

4. a.	Define FET. List out the difference between BJT and FET.	**06**	**(2:2:1.3.1)**
b.	Explain n-channel FET with a neat diagram.	**06**	**(2:2:1.3.1)**
c.	Explain the working of enhancement mode of n-channel FET along with its characteristics.	**08**	**(2:2:1.3.1)**

Module-3

5. a.	Define Op-Amp. Give the symbol and pin diagram of the same.	**06**	**(2:3:1.3.1)**
b.	List and explain the ideal characteristics of OP-AMP.	**06**	**(2:3:1.3.1)**
c.	Derive the output voltage equation of an inverting amplifier and non-inverting amplifier.	**08**	**(2:3:1.3.1)**

(OR)

Note: (**RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI - Performance Indicator**)

6.	**a.**	Explain how OP-AMP can be used as a voltage follower with a neat wave form.	06	(2:3:1.3.1)
	b.	Explain how OP-AMP can be used as a comparator.	06	(2:3:1.3.1)
	c.	Explain how OP-AMP can be used as an integrator and differentiator with a neat wave form.	08	(2:3:1.3.1)

Module-4

7.	**a.**	Convert following: (i) $76.57_{(8)}$ into_____ $_{(16)}$ (ii) $D5.A_{(16)}$ into____ $_{(8)}$	06	(2:4:1.3.1)
	b.	State and prove Demorgan's theorems.	06	(2:4:1.3.1)
	c.	Convert the following into Canonical forms: (i) f (A,B,C)=AC+AB+BC (ii) F(A,B,C)=(A+B).(B+C).(A+C)	08	(2:4:1.3.1)

(OR)

8.	**a.**	Define SOP and POS, and write the minterm and Maxterm for the given truth table.	06	(2:4:1.3.1)

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

	b.	Draw the symbols and truth table and equation for all logic gates.	06	(2:4:1.3.1)
	c.	Design and draw full-adder circuit using logic gates.	08	(2:4:1.3.1)

Module-5

9.	**a.**	Define embedded system. With a neat block diagram, explain elements of an embedded System.	06	(2:5:1.3.1)
	b.	Explain the classification of embedded system with a neat diagram.	06	(2:5:1.3.1)
	c.	List the difference between embedded systems Vs general computing system.	08	(2:5:1.3.1)

(OR)

10.	**a.**	List out the difference between microprocessor Vs microcontroller.	06	(2:5:1.3.1)
	b.	Explain the block diagram of general communication system.	06	(2:5:1.3.1)
	c.	Explain the different types of modulation techniques with neat wave forms.	08	(2:5:1.3.1)

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Note: (**RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI - Performance Indicator**)