PVP 23

Code: 23ES1103

I B.Tech - I Semester – Supplementary Examinations – MAY 2025

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

(Common for CE, ME, IT, AIML, DS)

Duration: 3 hours Max. Marks: 70

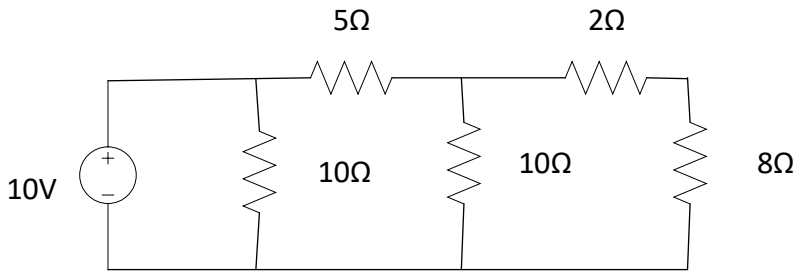
Note: 1. This question paper contains two Parts: Part-A and Part-B.
2. Each Part contains:
- 5 short answer questions. Each Question carries 1 Mark and
- 3 essay questions with an internal choice from each unit. Each question carries 10 marks.

3. All parts of Question paper must be answered in one place.

PART – A

1.a)	Develop the formula for energy stored by the inductor.
1.b)	Explain Cycle with an example.
1.c)	Explain about Step up transformer.
1.d)	Write various Non-Conventional energy resources of electricity.
1.e)	Write the application of Wheatstone bridge.

			Max. Marks
UNIT-I			
2	a)	Explain KVL, KCL with an example.	5 M
	b)	In the circuit shown in figure, Calculate the current through 8Ω resistor.	5 M

			
OR			
3	a)	Show that for a sinusoidal voltage RMS value is 0.707 times its maximum value. And compute the value of form factor for a sine wave.	5 M
	b)	State and explain superposition theorem with suitable example.	5 M
UNIT-II			
4	a)	Explain the construction of a Single phase transformer with a neat diagram.	5 M
	b)	Describe various applications of different electrical machines.	5 M
OR			
5	a)	Describe the difference between squirrel cage and slip ring induction motor.	5 M
	b)	Explain the working of PMMC instrument with a neat diagram.	5 M
UNIT-III			
6	a)	Demonstrate the function of various components in a Nuclear power plant.	5 M
	b)	Explain the significance of equipment earthing.	5 M
OR			
7	a)	Categorize various tariff methods? Discuss the two-part tariff method.	4 M
	b)	Explain the working principle of Fuse.	6 M

PART – B

1.f)	Explain the characteristics of p-n junction diode in forward bias.
1.g)	List the types of flip-flops.
1.h)	What is a rectifier?
1.i)	List the majority carriers in the regions of PNP transistor.
1.j)	Explain Ideal characteristics of a diode.

			Max. Marks
UNIT-I			
8	a)	Articulate the operation of PN junction diode and Draw the V-I Characteristics.	5 M
	b)	Explain how the transistor acts as Small Signal CE amplifier.	5 M
OR			
9	a)	Explain about input output characteristics of transistor in CB configuration.	5 M
	b)	Differentiate Zener diode and PN Junction Diode.	5 M
UNIT-II			
10	a)	Draw the circuit diagram of a full-wave bridge rectifier and explain how it rectifies an AC signal.	5 M
	b)	Explain how the Zener diode acts as a voltage regulator.	5 M
OR			

11	a)	Explain the operation of a Common Emitter Amplifier with RC coupling.	5 M
	b)	Draw and label block diagram of an electronic instrumentation system. Identify and briefly explain the main components and their functions within the system.	5 M
UNIT-III			
12	a)	Draw the schematic diagram of half adder and explain in detail about it.	5 M
	b)	Explain the concept of a universal gate. How can NAND gates alone be used to implement other logic gates.	5 M
OR			
13	a)	Convert $(101100)_2$ into decimal , octal and hexadecimal number systems.	5 M
	b)	Explain excess-3 code. How is it related to BCD? Provide an example of excess-3 code conversion.	5 M