Code: 23ES1103

I B.Tech - I Semester – Regular Examinations - JANUARY 2024
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.

BL – Blooms Level   CO – Course Outcome

PART – A

		BL	CO
1.a)	Can superposition theorem be applied to AC and DC circuits?	L2	CO2
1.b)	Define Apparent power and Power factor.	L2	CO2
1.c)	Why is scale of MI instrument calibrated non-linearly?	L2	CO1
1.d)	List the applications of dc motor.	L2	CO1
1.e)	Calculate the electricity bill amount for a month of 31 days, if 3 bulbs of 30 watts for 5 hours are used. Given the rate of electricity is 2 Rs. per unit.	L3	CO3

			BL	CO	Max. Marks
		UNIT-I			
2	a)	Use the superposition theorem to find v in the circuit shown in Fig.	L4	CO3	5 M

	b)	In a series circuit containing pure resistance, a pure inductance and a pure capacitance. Obtain the Voltage and current relationship with phasor diagram and explain how to calculate the average power drawn by the circuit and power factor?	L3	CO2	5 M
OR					
3	a)	An alternating voltage is given by V=230sin314t. Calculate i) frequency, ii) maximum value, iii) average value, iv) RMS value.	L4	CO3	5 M
	b)	State KCL, KVL and illustrate with an example how to calculate the currents and voltage.	L3	CO2	5 M

UNIT-II

4	a)	Outline the construction of DC machine.	L3	CO2	5 M
	b)	Describe the construction and working principle of PMMC.	L3	CO2	5 M
OR					
5	a)	Illustrate the construction and working of an alternator (or) synchronous generator.	L3	CO2	5 M
	b)	Describe the working principle of DC generator with a neat sketch.	L3	CO2	5 M

UNIT-III

6	a)	Explain the working principle of Miniature circuit breaker (MCB), its merits and demerits.	L3	CO3	5 M

	b)	Describe the wind power generation.	L3	CO2	5 M
OR					
7	a)	Outline the Electric Shock, Causes, Symptoms and safety Precautions to avoid shock.	L3	CO3	5 M
	b)	Illustrate the working of hydel power plant with a neat sketch.	L3	CO2	5 M

PART – B

			BL	CO
1.f)	How depletion region is formed in a PN diode?		L3	CO4
1.g)	Covert the binary code 100110 to ( )$_{10}$.		L3	CO4
1.h)	Explain the necessity of capacitor in Bridge Rectifier.		L3	CO4
1.i)	Mention the difference between Half wave and Full wave Rectifier.		L2	CO5
1.j)	What is a universal gate?		L2	CO4

			BL	CO	Max. Marks
UNIT-I					
8	a)	Outline the CB configuration of BJT with the help of input and output characteristics.	L4	CO5	5 M
	b)	What is PN junction diode? Explain the characteristics of PN junction diode in forward and reverse bias mode.	L3	CO4	5 M
OR					
9	a)	Explain the characteristics of zener diode in forward and reverse bias modes.	L3	CO4	5 M
	b)	Distinguish between avalanche breakdown and zener breakdown.	L4	CO5	5 M

		UNIT-II			
10	a)	Describe the working of Public Address system.	L3	CO4	5 M
	b)	Analyze the working of common emitter (RC coupled) amplifier with its frequency response.	L4	CO5	5 M
		OR			
11	a)	Analyze the output waveforms of full wave bridge rectifier with capacitive filter.	L4	CO5	5 M
	b)	Describe the working of Zener voltage regulator with neat sketch.	L3	CO4	5 M

UNIT-III

12	a)	Discuss the various number system conversions with the following examples. $(10110)_2 =(\ )_{10}$, $(71263)_8= (\ )_{10}$, $(5A8)_{16} = (\ )_8$	L4	CO5	5 M
	b)	Covert the following into Excess-3 code. i) 38 ii) 1111 iii) 1011.	L4	CO5	5 M
		OR			
13	a)	Explain the operation of JK and D-Flip flops with truth table.	L3	CO4	5 M
	b)	Outline the functionality of XOR and XNOR gates and mention its applications.	L3	CO4	5 M