Reg.No.: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 8031

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE / JULY 2024
Second Semester
Power Systems Engineering
P23PSE14 – INDUSTRIAL ELECTRIC DRIVES
(Regulation 2023)

Time: Three Hours   Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels	K1 – Remembering	K3 – Applying	K5 - Evaluating
(KL)	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Compare the merits of electric drive over mechanical drive.	2	K3	CO1
2.	What happens if the motor is selected at highest load handling capacity at continuous duty variable?	2	K2	CO1
3.	Make a comparison between the two types of drives employed for making the paper from pulp.	2	K3	CO2
4.	Identify a suitable motor and drive for large centrifugal pump and justify the reason for the selection.	2	K2	CO2
5.	What are the factors influencing the selection of transformers?	2	K1	CO3
6.	List the various causes of low power factor.	2	K1	CO3
7.	Mention the general specifications of LT circuit breaker.	2	K1	CO4
8.	A Battery bank has a terminal Voltage of 120 V DC. When supplying a current of 80 A, the terminal voltage falls to 96 V DC. Calculate the internal resistance of the battery bank.	2	K4	CO4
9.	What are the advantages of process automation?	2	K1	CO5
10.	Name various brands of PLC manufacturers available in the market.	2	K1	CO5

1

PART – B

Q.No.			Questions	Marks	KL	CO
11.	a)		Discuss the methods and considerations involved in selecting the power rating of a motor for a given application with suitable example.	13	K2	CO1
			(OR)			
	b)		Illustrate four quadrant operation of drive by considering hoist as an example.	13	K1	CO1
12.	a)		Describe the operations of the various motors used in the cement industry.	13	K2	CO2
			(OR)			
	b)		Demonstrate various processes involved in sugar mill with a neat process flow diagram.	13	K1	CO2
13.	a)	i.	Explain with neat diagram the starting of three phase slip ring induction motor.	7	K2	CO3
		ii.	Discuss the general information and guidelines related to earthing of electrical systems.	6	K2	
			(OR)			
	b)	i.	Mention the harmful effect of lightning. Discuss various devices used for protection against lightning.	7	K2	CO3
		ii.	Elucidate the role of shunt and series capacitors in power factor correction.	6	K3	
14.	a)		With the aid of block diagram, describe the operation of on-line UPS and off-line UPS.	13	K2	CO4
			(OR)			
	b)		Discuss the points to be considered to achieve the correct DG sizing with an example.	13	K3	CO4
15.	a)		Explain how PLC can be used to control the speed of AC Motor.	13	K3	CO5
			(OR)			
	b)		Draw the basic architecture of SCADA and explain the functions of each block.	13	K2	CO5

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Design the layout of industrial substation and discuss the functions of equipments used in the substation.	15	K3	CO3
	(OR)			
b)	Consider a production - line problem involving conveyor being used to transport bottles to a packaging unit, with the items being loaded onto the conveyor, checked to ensure they are full and capped and the correct number of bottles being packed in a container. The required control actions are thus: If a bottle is not full, the conveyor is stopped; the capping machine is activated when a bottle is at the required position, the conveyor being stopped during this time, count four bottles and activate packaging machine, with the conveyor stopped if another bottle comes to the packaging point at that time; and sound an alarm when the conveyor is stopped. Develop a ladder program to execute the above process.	15	K5	CO5