Hall Ticket Number :										

R-19

Code: 19A262T

III B.Tech. II Semester Supplementary Examinations Nov/Dec 2023

Power System Operation and Control

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

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Answer *five* questions by choosing one question from each unit (5 x 14 = 70 Marks)

			Marks	CO	BL
		UNIT–I			
1.	a)	Derive the expression for optimum generation allocation without transmission line losses.	7M	1	1
	b)	A power system consists of two 200MW units whose input cost data are represented by the equations: $C_1 = 0.03P_1^{\ 2} + 21P_1 + 750$ Rs/hour, $C_2 = 0.5P_2^{\ 2} + 18P_2 + 980$ Rs/hour. If the total received power $P_R = 350$ MW, determine the load division between the units for the most economic operation.	7M	1	3
		OR			
2.	a)	How are B-coefficients evaluated for transmission lines of the power system?	7M	1	2
	b)	Two power plants are connected together by a transmission line and load is connected at plant 2. When 150 MW are transmitted from plant-1, the transmission loss is 10MW. The cost characteristics of two plants are $C_1 = 0.05\ P_{G1}^2 + 13\ P_{G1}$ Rs/h $C_2 = 0.06\ P_{G2}^2 + 12\ P_{G2}$ Rs/h Find the optimum generation for λ=30.	7M	1	3
		UNIT–II			
3.	a)	Explain the hydrothermal scheduling problem.	7M	2	1
	b)	Explain the problem of scheduling hydrothermal power plants. Explain the constraints in the problem.	7M	2	1
		OR			
4.		Derive mathematical formulation for short term hydro thermal scheduling.	14M	2	2
		UNIT–III			
5.		Explain clearly about proportional plus integral LFC with a block diagram and prove that its change in frequency is zero.	14M	3	1
		OR			

6.		Derive the expression for change in static error frequency and tie line power in an identical two area LFC system with block diagram.	14M	3	2

UNIT–IV

7.	a)	Compare series, shunt compensations with their advantages and disadvantages.	7M	4	3
	b)	What is the importance of load compensation? What are the specifications of load compensation equipment?	7M	4	2

OR

8.	a)	Describe the performance of uncompensated transmission lines.	7M	4	3
	b)	Compare the different types of compensating equipment for transmission systems.	7M	4	3

UNIT–V

9.	a)	What are the major factor motivating the restructuring.	7M	5	2
	b)	Explain Transmission Pricing and Congestion Pricing.	7M	5	1

OR

10.	a)	Explain Electricity Price Volatility Electricity Price Indexes.	7M	5	1
	b)	Discuss about Short-time Price Forecasting.	7M	5	3

*** End ***

Hall Ticket Number :										

R-19

Code: 19A26CT

III B.Tech. II Semester Supplementary Examinations Nov/Dec 2023

Utilization of Electrical Energy

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	BL
		UNIT–I			
1.		Suggest with reasons the electric drives used for the following applications. (i) Rolling mills (ii) textile mills (iii) Cement mills (iv) Paper mills (v) Coal mining (vi) Lift, cranes, Lathes and pumps.	14M	CO1	L4
		OR			
2.	a)	A 3-φ induction motor has a ratio of maximum torque to full-load torque as 2:1. Determine the ratio of actual starting torque to full-load torque for $Y-\Delta$ starting. Given $R2 = 0.2\ \Omega$ and $X2 = 2\Omega$.	7M	CO1	L2
	b)	Determine the ratio of actual starting torque to full-load torque for star−delta starting. If a 3-φ induction motor has a ratio of maximum torque to full-load torque as 3:1 and the resistance and the reactance are 0.4 Ω and 5 Ω, respectively.	7M	CO1	L2
		UNIT–II			
3.		What are the characteristics of heating element? Explain the design of heating element in electric heating.	14M	CO2	L3
		OR			
4.	a)	Discuss various methods of controlling the temperature in dielectric heating	7M	CO2	L3
	b)	List out different welding electrodes and explain in detail.	7M	CO2	L3
		UNIT–III			
5.		Discuss the laws of illumination and its limitations in actual practice	14M	CO3	L3
		OR			
6.	a)	Explain the design procedure for good lighting system.	7M	CO3	L3
	b)	A room with an area of 6 × 9 m is illustrated by ten 80-W lamps. The luminous efficiency of the lamp is 80 lumens/W and the coefficient of utilization is 0.65. Find the average illumination.	7M	CO3	L3
		UNIT–IV			
7.	a)	A 230-V, 10-HP, and DC shunt motor with Ra = 0.2 Ω and Rsh = 80 Ω, runs at 1000 rpm on full load. The efficiency on the full load is 80%. If the speed is to be raised to 1200 rpm keeping load constant, determine extra resistance to be added in the field circuit. Assume 1 HP = 736 W.	7M	CO4	L3
	b)	Write the advantages and disadvantages of electric traction.	7M	CO4	L2
		OR			
8.	a)	Write a short note on adhesive weight.	7M	CO4	L2
	b)	Explain why a DC series motor is ideally suited for traction purposes?	7M	CO4	L2
		UNIT–V			
9.	a)	Enumerate the history of hybrid vehicles	7M	CO5	L3
	b)	Explain the Energy Savings Potential of Hybrid Drive trains	7M	CO5	L2
		OR			
10.	a)	Explain the impact of modern drive trains on energy supplies	7M	CO5	L3
	b)	Explain regenerative braking applied in electric vehicles	7M	CO5	L3

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Hall Ticket Number :										

R-19

Code: 19A261T

III B.Tech. II Semester Supplementary Examinations Nov/Dec 2023

Microprocessors and Microcontrollers

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	BL
		UNIT–I			
1.	a)	Explain the following instruction set of 8086 microprocessor with examples: (i) Bit Manipulation Instructions (ii) Program Execution Transfer Instructions (iii) Interrupt Instructions (iv) Arithmetic Instructions.	7M	CO1	L2
	b)	Write an assembly language program in 8086 to sort the given 'N' numbers in ascending order.	7M	CO1	L3
		OR			
2.	a)	Explain various Addressing modes of 8086 microprocessor.	7M	CO1	L2
	b)	Write an 8086 ALP to find the sum of numbers in the array of 10 elements.	7M	CO1	L3
		UNIT–II			
3.	a)	Draw the ADC interface to 8086 using 8255 PPI. With a neat program, explain how analog to digital conversion is carried out by 8086 microprocessor.	7M	CO2	L2
	b)	Explain the pin diagram of ADC 0808/0809	7M	CO2	L2
		OR			
4.	a)	Explain the vectored interrupt table of 8086 processor?	7M	CO2	L2
	b)	Discuss 8255 mode-0 operations and determine the control word with an example.	7M	CO2	L2
		UNIT–III			
5.	a)	Explain about necessity of communication interfaces and 8251 interfacing	7M	CO3	L2
	b)	Draw an internal architecture of USART 8251 and explain its different status and modes and control formats neatly.	7M	CO3	L2
		OR			
6.	a)	What are the important features of 8251	7M	CO3	L1
	b)	Discuss the overrun error and framing error with reference to 8251	7M	CO3	L2
		UNIT–IV			
7.	a)	Explain about Timers and serial communication features of 8051	7M	CO4	L2
	b)	Discuss about the organization of Internal RAM and Special function registers of 8051 Microcontroller in detail.	7M	CO4	L2
		OR			
8.		Explain instruction set of 8051 microcontroller with appropriate examples.	14M	CO4	L2
		UNIT–V			
9.	a)	Discuss about the I/O ports, Timers and ADC of Arduino	7M	CO5	L2
	b)	Mention the differences between 16-bit microcontroller and 8-bit microcontroller.	7M	CO5	L5
		OR			
10.	a)	Explain the features and applications of ARM9 microcontroller.	7M	CO5	L2
	b)	Draw the block diagram of ARDUINO microcontroller and explain its main features	7M	CO5	L2

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