Code: 19A27IT

IV B.Tech. I Semester Supplementary Examinations May/June 2024
Distribution of Electrical Power
(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

		Marks	CO	BL
1. a)	Derive the relation between load factor and loss factor?	7M	1	2
b)	Explain load modeling and its characteristics?	7M	1	5

OR

2. Define the following terms
    a) Maximum demand   b) coincident factor
    c) Plant factor   d) contribution factor
    e) diversity factor   14M   1   2

UNIT–II

		Marks	CO	BL
3. a)	List the design and operational aspects that affects the primary feeder voltage level	7M	2	1
b)	Discuss the coordination procedure between fuse and a circuit breaker	7M	2	2

OR

		Marks	CO	BL
4. a)	List out types protective devices used and explain principle of operation of any two protective devices	7M	2	1
b)	Discuss briefly the design considerations in distribution system	7M	2	2

UNIT–III

		Marks	CO	BL
5. a)	How do you find the rating of a distribution substation and explain?	7M	3	2
b)	Write the differences between indoor and outdoor substations?	7M	3	2

OR

		Marks	CO	BL
6. a)	How do you analyze a substation service area with 'n' primary feeders?	7M	3	4
b)	Write the benefits derived through optimal location of substations?	7M	3	2

UNIT–IV

		Marks	CO	BL
7. a)	Enumerate methods of power factor improvement. Explain any one method in detail.	7M	4	2
b)	Write a short note on necessity of voltage control utilize graphical illusions wherever necessary.	7M	4	2

OR

8. Write a short note on
    i)   Power Factor Correction,
    ii) Economic Justification for Power Factor Correction and
    iii) Procedure to determine the best capacitor location   14M   4   2

UNIT–V

		Marks	CO	BL
9. a)	Write factors affecting distribution system planning	7M	5	2
b)	Classify and explain load forecasting in distribution system planning	7M	5	1

OR

		Marks	CO	BL
10. a)	Model the distribution system planning methods	7M	5	5
b)	Discuss the present distribution system planning techniques	7M	5	2

END

R-19

Code: 19A272T

IV B.Tech. I Semester Supplementary Examinations May / June 2024
Powersemi Conductor Drives
(Electrical and Electronics Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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UNIT–I

1. a) Explain speed-torque characteristics of a 1- Semi converter connected to separately excited D.C motor with continuous current operation. Draw the relevant wave forms. 7M

    b) A 220 Volts, 960rpm, 13 Amps separately excited d.c. motor has armature resistance of 2 ohms. It is fed from a single-phase fully controlled rectifier with an a.c. source of 230volts, 50HZ. Assuming continuous conduction, Calculate motor torque for = 60^0 and speed 600 rpm. 7M

OR

2. a) Derive the Speed, Torque equations of a fully controlled converter connected to a 3- D.C Series motor for continuous current mode and draw the necessary waveforms. 7M

    b) A DC series motor has Ra = 3 , Rf = 3 and Kaf = 0.15V-sec/rad. The motor speed is varied by a 3- Semi converter bridge. The firing angle is 45^0 and the average speed of the motor is 1450 rpm. The applied ac voltage to the bridge is 330 sin t. Assuming, continuous motor current, find the steady state average motor current and torque. 7M

UNIT–II

3. a) Draw the speed torque characteristic for dynamic braking of DC series motor. Why torque becomes zero at finite speed? 8M

    b) Discuss relative merits and demerits of four quadrant DC drives employing non-circulating and circulating current modes with dual converters. 6M

OR

4. a) Draw and explain the block diagram of closed loop speed control of DC motor for below and above base speed. 8M

    b) A 400V, 750 rpm, 70A DC shunt motor has an armature resistance of 0.3 when running under rated conditions, the motor is to be braked by plugging with armature current limited to 90A. How much external resistance should be connected in series with the armature? Calculate the initial braking torque and its value when the speed has fallen to 300 rpm. 6M

UNIT–III

5. a) Explain the operation of Step-up chopper with circuit diagram & waveforms. 7M

    b) A 220V, 1000 RPM and 100A separately excited dc motor has an armature resistance of 0.05 . The motor is fed from a chopper which provides both Motoring and braking operations. The source has a voltage of 220V. Assuming Continuous conduction. Calculate duty ratio of chopper for motoring operation at rated torque and 350 rpm. 7M

OR

6. a) Discuss the Two Quadrant operation of Type B chopper fed drives and draw the relevant waveforms 7M

    b) Explain the closed loop operation of chopper fed separately excited d.c. motor 7

UNIT–IV

7. a) Explain plugging operation of 3- induction motor and also explain how it is implemented using AC voltage controllers. 7M

b) Explain why stator voltage control is an inefficient method of induction motor speed control. 7M

OR

8. Explain the operation of induction motor for two different cases when fed by current source inverters,

      a. Operation at and below rated frequency

      b. Operation above rated frequency 14M

UNIT–V

9. a) Explain in detail about Static Kramer Drive with neat circuit diagram. 7M

b) 3-Phase, 400V, 50 Hz, 4pole, 1400 rpm, star connected wound rotor induction motor has the following parameters referred to the stator. R1 = 2 ,R2 = 3 , X1 = X2^1= 3.5 . The stator to rotor turns ratio is 2. The motor speed is controlled by static scherbius drive. The inverter is directly connected to the source. Determine:

The firing angle for 0.4 times the rated motor torque and speed of 1200 rpm. 7M

OR

10. Describe separate controlled mode and self- controlled mode of operation of a Synchronous motor drive in detail and compare them 14M

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