Hall Ticket Number :										

R-20

Code: 20A25AT

III B.Tech. I Semester Regular Examinations Dec 2022/Jan 2023

Distribution of Electrical Power

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

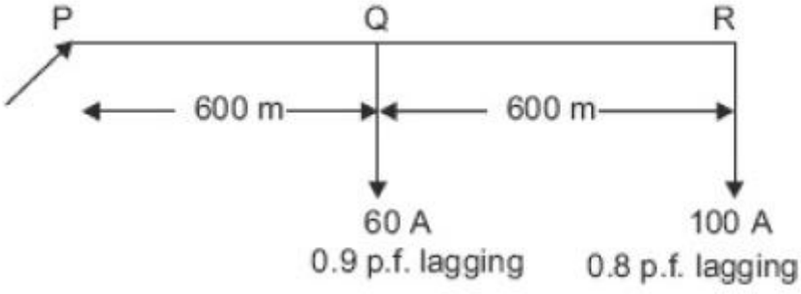
(Compulsory question)

		CO	BL
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	Define Demand factor. Why the value of demand factor is important in distribution network?	1	L3
b)	Enumerate the merits and demerits of Underground distribution system.	2	L2
c)	List different equipment used in distribution substation.	3	L1
d)	Why shunt capacitor banks used for compensation are connected in Δ? Not in Y	4	L2
e)	What is the role of SCADA	5	L1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT–I			
2. a)	Write the relationship between load factor and loss factor during peak loading and off peak loading on the network.	6M	1	L2
b)	A Generating Station has a connected load of 43MW and a maximum demand of 20MW, the units generated being $61.5X10^6$ per annum. Calculate (i) The Demand Factor and (ii) Load Factor	6M	1	L3
	OR			
3.	How do you classify the Loads and give its characteristics?	12M	1	L1
	UNIT–II			
4. a)	Discuss the requirement and design consideration of Distribution System.	6M	2	L3
b)	A Two-Wire distributor 1200m long is loaded as shown in Fig(1).The power factor at the two load points refer to the voltage at R. The impedance of each line is (0.15+j0.2) Ω. Calculate the (i) Sending-End Voltage (ii) Current and Power Factor. The voltage at point R is 230v.			



Fig(1):AC Two-Wire Distributor 6M 2 L3

OR

5.	a)	List out and explain about the factors effecting primary feeder voltage levels.	6M	2	L2
	b)	Compare A.C. and D.C. Distribution System.	6M	2	L2

UNIT–III

6.		Enumerate various factors affecting the selection of a site for substation. Explain the procedure of obtaining optimal location of a substation by network flow techniques.	12M	3	L1

OR

7.		Briefly explain any four types of bus bar switching schemes in a substation.	12M	3	L1

UNIT–IV

8.	a)	With the help of detailed algorithm explain the practical procedure to determine the optimal capacitor location in a distribution network.	6M	4	L2
	b)	Assume that a three phase 500HP 50Hz 6.6KV Y connected induction motor has a full load efficiency of 88%, a lagging power factor of 0.75 and is connected to a feeder. It is desired to correct the power factor of the load to a lagging power factor of 0.9 by connecting capacitors at the load. Determine the following: (i) The rating of capacitor bank in KVArs. (ii) The capacitance of each unit if the capacitors are connected in delta	6M	4	L3

OR

9.	a)	How do you justify economically the connection of capacitors for the improvement of Power Factor?	6M	4	L5
	b)	Explain the effects of series and shunt capacitors in distribution systems.	6M	4	L2

UNIT–V

10.	a)	What are the objectives and benefits of Distribution Automation?	6M	5	L1
	b)	What are the functions of distribution SCADA	6M	5	L1

OR

11.	a)	Discuss about project planning of Distribution Automation (DA).	6M	5	L2
	b)	Write short notes on (i) RTUs (ii) PSTN	6M	5	L2

*** End ***

Hall Ticket Number :										

R-20

Code: 20A253T

III B.Tech. I Semester Regular Examinations Dec 2022/Jan 2023

Electric Power Transmission and Switch Gear

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

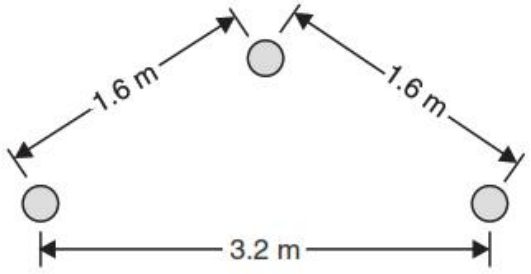
PART-A

(Compulsory question)

1. Answer ***all*** the following short answer questions (5 X 2 = 10M)	CO	BL
a) Write the equation for internal flux linkages and external flux linkages?	1	1
b) Write the ABCD parameters of short transmission line?	2	2
c) List the disadvantages of corona?	3	2
d) Write the equation for Insulation resistance of a cable?	4	1
e) What do you mean by arc splitting?	5	1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL
		UNIT–I			
2.	a)	Explain composite conductors?	6M	1	2
	b)	A conductor consists of seven identical strands each having a radius of r. Determine the factor by which r should be multiplied to find the self GMD of the conductor.	6M	1	3
		OR			
3.	a)	Derive the inductance of three phase symmetrical conductors?	6M	1	2
	b)	Determine the inductance of a 3-phase line operating at 50 Hz and conductors arranged as follows. The conductor diameter is 0.8 cm 	6M	1	4
		UNIT–II			
4.	a)	Explain i)Ferranti effect ii)Skin effect	6M	2	2
	b)	Determine the sending end voltage, current, power factor of a 1-phase 50 Hz, 76.2 kV transmission delivering a load of 12 MW at 0.8 p.f. The line constants are R = 25 ohm, inductance 200mH and capacitance between lines 2.5μF. Also determine the regulation and η of transmission. Use nominal-π method. Draw phasor diagram	6M	2	3

OR

5.	a)	Explain the effect of power factor on efficiency and regulation of transmission line?	6M	2	3
	b)	A 400 V 3-phase 4-wire system supplies the following loads: Phase R-40 A at p.f. 0.8 lagging, phase Y-30 A at unity p.f. and phase B-20 A at 0.8 leading. The resistance of each conductor is 0.2 ohm and of the neutral 0.4 ohm. Determine the load voltages	6M	2	4

UNIT–III

6.	a)	Derive the critical visual disruptive voltage?	6M	3	2
	b)	A conductor with 2.5 cm dia is passed centrally through a porcelain bushing $\varepsilon r = 4$ having internal and external diameters of 3 cm and 9 cm respectively. The voltage between the conductor and an earthed clamp surrounding the porcelain is 20 kV r.m.s. Determine whether corona will be present in the air space round the conductor?	6M	3	4

OR

7.	a)	Explain about static shielding of insulators?	6M	3	2
	b)	An overhead transmission line has a span of 220m, the conductor weighing 804kg/km. Calculate the maximum sag if the ultimate tensile strength of the conductor is 5,758kg.Assume safety factor 2.	6M	3	4

UNIT–IV

8.	a)	Explain the capacitance grading of cable?	6M	4	2
	b)	Derive the equation for capacitance of a 3 core-cable?	6M	4	2

OR

9.		A 3-phase, 3-core, metal sheathed cable gave the following results on test for capacitance: (i) Capacitance between two conductors bunched with the sheath and the third conductor 0.4 μF per km. (ii) Capacitance between bunched conductors and sheath 0.625 μF/km. Determine the capacitance (a) between any two conductors, and (b) between any two bunched conductors and the third conductor if the sheath is insulated. (c) Also calculate the charging current per phase per km. when it is connected to 10 kV, 50 Hz supply.	12M	4	4

UNIT–V

10.	a)	Explain the following terms (i) Restriking voltage (ii) Recovery voltage (iii) Circuit breaker (iv) Fuse	6M	5	2
	b)	In a system of 132 kV, the line to ground capacitance is 0.01 μF and the inductance is 5 henries. Determine the voltage appearing across the pole of a C.B. if a magnetising current of 5 amps (instantaneous value) is interrupted. Determine also the value of resistance to be used across the contacts to eliminate the restriking voltage.	6M	5	3

OR

11.		Explain the operation of Vacuum circuit breakers and Minimum oil circuit breaker?	12M	5	2

*** End ***

Hall Ticket Number :										

R-20

Code: 20AE5AT

III B.Tech. I Semester Regular Examinations Dec 2022/Jan 2023

Human Resource Management

(Common to CE, EEE & ECE)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	BL
1.	Answer all the following short answer questions (5 X 2 = 10M)		
a)	List the functions of HRM.	1	1
b)	Define Human Resources Information Systems.	1	1
c)	Define Selection.	1	1
d)	Define Career Development.	1	1
e)	Define Performance Appraisal.	1	1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT–I			
2.	Discuss in detail the competitive challenges influencing HRM.	12M	1	2
	OR			
3.	Describe in detail, the ethical aspects of HRM.	12M	1	2
	UNIT–II			
4.	Discuss in detail, the significance of Human Resources Planning with specific reference to the IT Industry.	12M	2	2
	OR			
5.	Discuss in detail, the various Factors affecting Job Design and the approaches to Job design.	12M	2	2
	UNIT–III			
6.	Discuss in detail, the process and sources of recruitment.	12M	3	2
	OR			
7.	Discuss in detail, the various barriers to effective selection.	12M	3	2
	UNIT–IV			
8.	Discuss in detail the various methods of training.	12M	4	2
	OR			
9.	Describe the various impediments that can be a barrier for effective training.	12M	4	2
	UNIT–V			
10.	Describe in detail, the concept of wage policy in the Indian Context.	12M	5	2
	OR			
11.	Discuss in detail, the importance and approaches to effective Industrial Relations.	12M	5	2

*** End ***

Hall Ticket Number :										

R-20

Code: 20A252T

III B.Tech. I Semester Regular Examinations Dec 2022/Jan 2023

Power Electronics

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	BL
1.	Answer all the following short answer questions (5 X 2 = 10M)		
	a) Define latching current of SCR.	1	1
	b) Specify the purpose of snubber circuit.	2	2
	c) Illustrate Delay angle in converter circuits	3	3
	d) Define duty-cycle.	4	1
	e) Distinguish between ON-OFF control and phase control.	5	4

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT–I			
2.	Explain the operation of IGBT with the help of neat structural diagram and suitable waveforms	12M	1	2
	OR			
3.	a) Draw and explain the VI characteristics of SCR.	6M	1	2
	b) Explain the principle of operation and characteristics of MOSFET	6M	1	2
	UNIT–II			
4.	a) Illustrate the Over current protection by fast acting current limiting fuse.	6M	2	2
	b) Demonstrate the Over voltage protection by Metal Oxide Varistors.	6M	2	2
	OR			
5.	Analyze the Improving of dv/dt rating with Cathode and short di/dt improvement by high gate current with illustration.	12M	2	4
	UNIT–III			
6.	Describe the working of three phase fully controlled bridge converter. And derive the expressions for average output voltage and rms output voltage.	12M	3	3

OR

7.	a)	Analyse the advantages of single phase bridge converter over single phase mid-point converter?	6M	3	4
	b)	Specify the function of freewheeling diodes in controlled rectifier.	6M	3	4

UNIT–IV

8.		Describe the working principle of boost converter with necessary circuit and waveforms.	12M	4	2

OR

9.		Draw the circuit diagram of voltage reversal chopper and explain its working principle with necessary waveforms.	12M	4	2

UNIT–V

10.		For the following different modulation techniques, show the operation of PWM inverters. (i) Single PWM (ii) Multiple PWM	12M	5	4

OR

11.		With suitable phase and line voltage waveforms of 3φ VSI, explain its operation.	12M	5	4

*** End ***

Hall Ticket Number :										

R-20

Code: 20A25DT

III B.Tech. I Semester Regular Examinations Dec 2022/Jan 2023

Renewable Energy Systems

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	BL
1.	Answer ***all*** the following short answer questions **(**5 X 2 = 10M)		
	a) Compose the environmental impact of fossil fuels	1	4
	b) State the principle involved in generating solar power.	2	2
	c) Analyze the factors involved in estimation of wind energy at a site?	3	4
	d) What is tidal energy?	4	1
	e) List the types of biomass conversion.	5	1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT–I			
2.	a) Write the important differences between renewable and nonrenewable source	7M	1	1
	b) What are the reasons for variation in the amount of solar energy reaching earth surface?	5M	1	1
	OR			
3.	a) Examine the working of a pyranometer.	7M	1	3
	b) Explain in detail about solar radiation on titled surface.	5M	1	1
	UNIT–II			
4.	a) What are the main components of a flat plate solar collector?	6M	2	2
	b) With a neat schematic diagram, explain working of a solar water heating system	6M	2	2
	OR			
5.	a) Explain the following solar energy application with neat sketches. (i) Solar distillation, (ii) Photovoltaic energy conversion.	6M	2	2
	b) Classify solar energy storage systems. Describe in brief any one of the different storage systems.	6M	2	4

UNIT–III

6.	a)	What is Wind power and derive the equation of power in wind	6M	3	3
	b)	Explain about the components of wind power plant with necessary diagram.	6M	3	2
		OR			
7.	a)	Explicate in brief the performance characteristics of wind machines.	6M	3	3
	b)	Briefly explain about the aerodynamics wind turbine.	6M	3	2

UNIT–IV

8.	a)	Explain the different economic and environmental considerations of tidal power plant.	6M	4	1
	b)	Describe in detail the operation of double basin type tidal power plant.	6M	4	3
		OR			
9.	a)	List three legal or planning issues that are important for the deployment of wave power devices.	5M	4	4
	b)	Explain the working principle of OTEC plants	7M	4	2

UNIT–V

10.	a)	Describe in detail how biomass conversion takes place	7M	5	2
	b)	Explain the combustion characteristics and economic aspects of biogas.	5M	5	2
		OR			
11.	a)	Explain a hot dry rock type Geothermal resource power plant.	5M	5	2
	b)	Describe in detail the operation dry binary cycle geothermal power plant.	7M	5	2

*** End ***

Hall Ticket Number :										

R-20

Code: 20A251T

III B.Tech. I Semester Regular Examinations Dec 2022/Jan 2023

Linear Control Systems

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

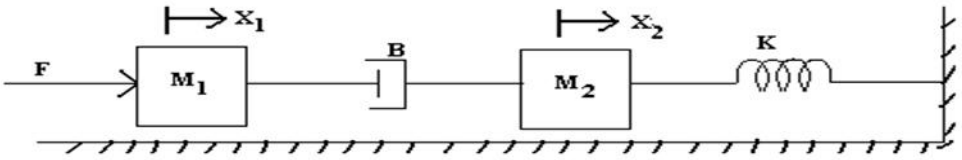
PART-A

(Compulsory question)

			CO	BL
1.	Answer ***all*** the following short answer questions	(5 X 2 = 10M)		
a)	Define control system with examples.		1	1
b)	What is an order of a system?		2	1
c)	What is Routh Hurwitz Stability Criterion?		3	1
d)	What is the necessity of compensation?		4	1
e)	What are the characteristics of State Transition Matrix?		5	1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL
		UNIT–I			
2.	Determine the Transfer function for the Mechanical Network X2(s)/F(s)		12M	1	2
		OR			
3. a)	Write a short note on various rules in Block Diagram Algebra.		7M	1	2
b)	What does the importance of Feedback system also discuss any one of the characteristics of Feedback system?		5M	1	1
		UNIT–II			
4. a)	A unity feedback system is characterized by the open loop transfer function G(s) = 10/s (0.1s+1). Determine the static error constants for the system. Obtain the steady state error when the system is subjected to an input given by the polynomial $r(t) = a_0 + a_1 t + a_2 t^2/2$		12M	2	2
		OR			

5.	Compute the time domain Specifications in the Unit step response of Given Second order System. $\frac{C(S)}{R(S)} = \frac{36}{S^2+2S+36}$	12M	2	2
	UNIT–III			
6.	Sketch the root locus plot of a unity feedback system with open-loop transfer function $G(s) = \frac{k}{s(s+2)(s+4)}$	12M	3	2
	OR			
7. a)	Comment the statbility for a given characteristic equation by R-H criterion $4S^4+10S^3+2S^2+3S+6=0$	6M	3	2
b)	Open loop transfer function for a unity feedback control system $G(s)=100/ (S^2 (S+30))$ Draw polar plot?	6M	3	2
	UNIT–IV			
8.	Consider a unity feedback system having an open loop transfer function, $G(s) = \frac{1}{s(1+0.2s)(1+0.05s)}$ Sketch the Magnitude and Phase plot using Bode plot.	12M	4	2
	OR			
9.	Design a lag compensator to get the following specifications. Damping ratio $\zeta = 0.4$, settling time $t_{ss}=10_{sec,}$ velocity error constant $K_v = 5sec^{-1}$ for the system whose open loop transfer function is $G(s) = \frac{K}{s(s+1)(s+4)}$ with unity feedback using Bode plot.	12M	4	2
	UNIT–V			
10.	Derive state space model of the armature-controlled DC servo motor.	12M	5	2
	OR			
11. a)	Determine whether the following system is controllable and Observable. $A=\begin{bmatrix}-5 & 0 & 0\\ 0 & -3 & 0\\ 0 & 0 & -2\end{bmatrix}$ $B=\begin{bmatrix}0\\ -1.414\\ 0\end{bmatrix}$ $C=\begin{bmatrix}-0.5345 & -1.4142 & 0.7071\end{bmatrix}$ $D=\begin{bmatrix}0\end{bmatrix}$	6M	5	2
b)	Obtain the state model in controllable canonical form for the system described by the differential equation $3y^{II}+y^{I}+2y = u^{I}-2u.$	6M	5	2

*** End ***