SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
[B17EE4101]
IV B. Tech I Semester (R17) Regular Examinations
ELECTRIC DRIVES
ELECTRICAL AND ELECTRONICS ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
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			CO	KL/ PO	M
		UNIT-I			
1.	**a).**	Illustrate four quadrant operation of electric drive?	**CO1**	**K4/ PO1 , PO2**	**7**
	b).	A drive has the fallowing parameters t= (200 - 0.2N)Nm. T1=100nm where n is the speed in rpm. Initially the drive is operating in steady state, the characteristics of load torque are changed to –100Nm. Calculate the initial and final equilibrium speeds.	**CO1**	**K4/ PO1 , PO2**	**7**
		OR			
2.	**a).**	Express functions of power modulator.	**CO1**	**K4/ PO1 , PO2**	**7**
	b).	A 220v, 875rpm, 150a, separately excited dc motor, an armature resistance of 0.05Ω.it is fed from single phase fully controlled rectifier with an ac source voltage of 220v, 50hz.assuming continuous conduction, figure out A.)Firng angle for rated motor torque and -500rpm B.)Motor speed for α=160° and rated torque.	**CO1**	**K4/ PO1 , PO2**	**7**
		Unit-II			
3.	**a).**	Illustrate and derive single phase full converter fed separately excited dc drive for discontinuous mode of operation	**CO2**	**K4/ PO1 , PO2 , PO3**	**7**
	b).	200v, 875 rpm 150a separately excited dc motor has an armature resistance of 0.06ohms. It is Fed from a single phase fully controlled rectifier with an ac source voltage of 220v, 50hz, Assuming continuous conduction. Figure out firing angle for rated motor torque and 750rpm	**CO2**	**K4, PO1 , PO2 , PO3**	**7**
		OR			
4.	**a).**	Explain the chopper-controlled dc series motor with continuous current operation.	**CO2**	**K4/ PO1**	**7**

				, PO2 , PO3	
	b).	Explain the Closed loop control of DC drive Only Block Diagram	**CO2**	**K4/ PO1 , PO2 , PO3**	**7**
		Unit-III			
5.	**a).**	Explain and derive speed torque expression for chopper controlled fed separately excited dc motor.	**CO3**	**K4/ PO1 , PO2 , PO3**	**7**
	b).	A 230v,960 rpm and 200aseparately excited dcmotor as an armature resistance of 0.02ohms the motor is fed from a chopper which provides both motoring and braking operation, the source has a voltage of 230v assume continuous conduction. Figure out I. Duty ratio of chopper for motoring operation at rated torque and 350 rpm ii. Duty ratio of chopper for braking operation at rated torque and 350 rpm	**CO3**	**K4/ PO1 , PO2 , PO3**	**7**
		OR			
6.	**a).**	Explain the Chopper controlled DC separately excited motor and DC series motor	**CO3**	**K4/ PO1 , PO2 , PO3**	**7**
	b).	Explain the Continuous current operation in chopper controlled fed DCdrives.	**CO3**	**K4/ PO1 , PO2 , PO3**	**7**
		Unit-IV			
7.	**a).**	Explain Static Kramer's Drive with circuit diagram	**CO4**	**K4/ PO1 , PO2 , PO3**	**7**
	b).	Explain Static Scherbius Drive with circuit diagram	**CO4**	**K4/ PO1 , PO2**	**7**

				, PO3	
OR					
8.	**a).**	A 440V,50HZ,970 RPM ,6 pole ,star-connected, three phase, wound rotor induction motor has following parameters referred to the stator R_s =0.1ohms ,R_r =0.08ohms ,X_S=0.3 ohms X_r=0.4 ohms the stator to rotor turns ratio is 2 motor speed is controlled by static scherbius drive, Drive is designed for a speed range of 25% below the synchronous speed ,maximum value of firing angle is 165^0. Calculate i) transformer turns ratio ii) Torque for a speed of 780 RPM and $\alpha=140^0$	**CO4**	**K4/ PO1 , PO2 , PO3**	**7**
	b).	Explain the operation of closed loop DC drive.In choppercontrolled fed DC Drives	**CO4**	**K4/ PO1 , PO2 , PO3**	**7**
UNIT-V					
9.	**a).**	Illustrate motoring and generating modes of operation of a separately excited dc machine	**CO5**	**K3/ PO1 , PO2 ,**	**7**
	b).	Explain theTrue synchronous principal operation	**CO5**	**K4/ PO1 , PO2 ,**	**7**
OR					
10.	**a).**	Explain principal and operation of brush less DC motor drive	**CO5**	**K4/ PO1 , PO2 ,**	**7**
	b).	Explain the principal and operation of the stepper motor	**CO5**	**K4/ PO1 , PO2 ,**	**7**

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SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
[B17EE4102]
IV B. Tech I Semester (R17) Regular Examinations
POWER SYSTEM OPERATION AND CONTROL
ELECTRICAL AND ELECTRONICS ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
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			CO	KL/ PO	M
		UNIT-I			
1.	**a).**	Derive the equation for optimal load sharing among n units in a power system by neglecting transmission losses.	**CO1**	**K3/ PO1**	**7**
	b).	A constant 30MW supplied by two 150MW generators, 1 and 2 for which the respective incremental fuel costs are dC1/dP1=0.1P1+20, dC2/dP2=0.2P2+25. With P in MW and C in Rs/h. **Calculate** (i) the most economical division of load between the generators (ii) the saving in Rs/day there by obtain compared to equal load sharing between the machines.	**CO1**	**K4/ PO2**	**7**
		OR			
2.	**a).**	Explain the problem of scheduling hydrothermal power plants. Explain the constraints in the problem.	**CO1**	**K3/ PO1**	**7**
	b).	A power system consists of two 200MW units whose input cost data are represented by the equations: C1 = 0.03P1 2 + 21P1 + 750 Rs/hour, C2 = 0.5P2 2 + 18P2 + 980 Rs/hour. If the total received power PR = 350 MW, **compute** the load division between the units for the most economic operation.	**CO1**	**K4/ PO2**	**7**
		Unit-II			
3.	**a).**	What is meant by unit commitment problem? Explain the need for unit commitment problem in operation of power system	**CO2**	**K3/ PO1**	**7**
	b).	With the help of flow chart, explain the solution of unit commitment problem using dynamic programming.	**CO2**	**K3/ PO1**	**7**
		OR			
4.	**a).**	Discuss about different constraints considered in solving a unit commitment problem	**CO2**	**K3/ PO1**	**7**
	b).	Explain briefly about the different unit commitment solution methods.	**CO2**	**K3/ PO1**	**7**
		Unit-III			
5.	**a).**	Discuss the importance of combined load frequency control and economic dispatch control with a neat block diagram.	**CO3**	**K3/ PO1**	**7**
	b).	Draw the block diagram of uncontrolled two area load frequency control system and explain the salient features under static condition.	**CO3**	**K3/ PO1**	**7**
		OR			
6.	**a).**	Explain the mathematical modeling of speed governing system and derive the transfer function of speed governor model. State the assumptions made.	**CO3**	**K3/ PO1**	**7**
	b).	A 200 MVA synchronous generator is operating at 3000 rpm, 50Hz. A load of 40MW is suddenly applied to the machine and the steam valve of the turbine opens only after 0.4 sec due to the time lag in the generator action.	**CO3**	**K4/ PO2**	**7**

		Calculate the frequency to which the generated voltage drops before the steam flow commences to increase to meet the new load. Given that the value of H of the generator is 5.5 kW-sec/KVA of the generator capacity.			
Unit-IV					
7.	**a).**	What are the merits and demerits of shunt and series compensation?	**CO4**	**K3/ PO1**	**7**
	b).	A short transmission line having an impedance of (2+j3) ohms interconnects two power stations A and B both operating at 11 kV; equal in magnitude and phase. To transfer 25 MW at 0.8 p.f. lagging from A to B determine the voltage boost required at plant A.	**CO4**	**K4/ PO2**	**7**
OR					
8.	**a).**	What do mean by compensation of a line? Discuss briefly different methods of compensation.	**CO4**	**K3/ PO1**	**7**
	b).	Define fundamentals of FACTS devices and Write the need for FACTS controllers.	**CO4**	**K3/ PO1**	**7**
UNIT-V					
9.	**a).**	Explain the concepts of coherent area dynamic with a detailed example.	**CO5**	**K3/ PO1**	**7**
	b).	Discuss about long term frequency dynamics and center ofinertia.	**CO5**	**K3/ PO1**	**7**
OR					
10.	**a).**	Explain the stability enhancement methods	**CO5**	**K3/ PO1**	**7**
	b).	Explain the four operating states of Power system with a neat sketch.	**CO5**	**K3/ PO1**	**7**

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SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
[B17EE4103]
IV B. Tech I Semester (R17) Regular Examinations
ELECTRIC VEHICLES
ELECTRICAL AND ELECTRONICS ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
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			CO	KL/ PO	M
UNIT-I					
1.	**a).**	Explain in detail evolution of EVs.	**CO1**	**K4/ PO7**	**7**
	b).	Describe Vehicle dynamics with fixed tractive effort	**CO1**	**K4/ PO2**	**7**
OR					
2.	**a).**	Compare EV with IC Engine Vehicle.	**CO1**	**K4/ PO2**	**7**
	b).	What Vehicle resistance, explain in detail	**CO1**	**K4/ PO2**	**7**
Unit-II					
3.	**a).**	Explain in detail EV motor sizing	**CO2**	**K4/ PO2**	**7**
	b).	Discuss Various configurations of EVs in detail	**CO2**	**K4/ PO2**	**7**
OR					
4.	**a).**	Discuss in detail about power train components.	**CO2**	**K4/ PO2**	**7**
	b).	Explain the operation of parallel HEV	**CO2**	**K4/ PO2**	**7**
Unit-III					
5.	**a).**	What is the importance of lead acid battery,explain its operation?	**CO3**	**K4/ PO7**	**7**
	b).	Explain in Detail Battery Management System in EVs	**CO3**	**K4/ PO2**	**7**
OR					
6.	**a).**	What are various battery performance parameters and compare various batteries by using the battery performance parameters	**CO3**	**K4/ PO2**	**7**
	b).	What are various Li ion batteries and explain their operation and how safety is important in handling the lithium ion batteries	**CO3**	**K4/ PO7**	**7**
Unit-IV					
7.	**a).**	Explain the working schematic of DC drives with respect to EV.	**CO4**	**K4/ PO2**	**7**
	b).	Explain the working schematic of SRM drives with respect to EV.	**CO4**	**K4/ PO2**	**7**
OR					

8.	**a).**	Explain the working schematic of PM-BLDC drives with respect to EV.	**CO4**	**K4/ PO2**	**7**
	b).	Explain the working of Electric Drive Components	**CO4**	**K4/ PO2**	**7**
UNIT-V					
9.	**a).**	Explain various charging algorithms of EVs	**CO5**	**K4/ PO3**	**7**
	b).	What is the need of Power aggregator in infrastructure system, explain in detail	**CO5**	**K4/ P06**	**7**
OR					
10.	**a).**	Explain in detail V2G Technology	**CO5**	**K4/ P03**	**7**
	b).	What are various wireless power transfer techniques, Explain in detail Inductive power Transfer System in EVs	**CO5**	**K4/ PO6**	**7**

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SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
[B17EE4104]
IV B. Tech I Semester (R17) Regular Examinations
Elective-I : OPERATIONS RESEARCH
ELECTRICAL AND ELECTRONICS ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
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			CO	KL/ PO	M
		UNIT-I			
1.	**a).**	A firm manufactures two types of products A & B and sells them at a profit of Rs. 2/- on type-A and Rs. 3/- on type-B. Each product is processed on two machines G and H. Type-A requires 1 min. of processing time on G and 2 min. on H, type-B requires 1 min. on G and 1 min. on H. The machine G is available for not more than 6 hrs 40 min while machine H is available for 10 hrs during any working day. Formulate the problem as a Linear Programming Problem (LPP).	CO1	K3, K4/ PO1 PO2	7
	b).	Using graphical method, solve the following LPP Maximize $Z = 3x_1 + 4x_2$ Subject to the constraints $2x_1 + x_2 \leq 40$ $2x_1 + 5x_2 \leq 180$ and $x_1 \geq 0, x_2 \geq 0$	CO1	K3/ PO1	7
		OR			
2.	**a).**	State the general Linear Programming Problem and put it in the standard form and also explain slack and surplus variables.	CO1	K3/ PO1	6
	b).	Solve the following LPP by using simplex method Minimize $Z = x_1 - 3x_2 + 2x_3$ Subject to the constraints $3x_1 - x_2 + 3x_3 \leq 7$ $-2x_1 + 4x_2 \leq 12$ $-4x_1 + 3x_2 + 8x_3 \leq 10$ and $x_1, x_2, x_3 \geq 0.$	CO1	K3/ PO1	8
		Unit-II			

3.	**a).**	What is an unbalanced transportation problem? How do you proceed with such problems to solve them?	**CO2**	**K3/ PO1**	**4**
	b).	Find the basic feasible solution for the transportation problem using North West corner rule and Vogel's approximation (VAM) method. Compare the transportation costs in two methods.	**CO2**	**K3/ PO1**	**10**

	D_1	D_2	D_3	D_4	Supply
O_1	19	30	50	10	7
O_2	70	30	40	60	9
O_3	40	8	70	20	18
Demand	5	8	7	14	

OR

4.	**a).**	Solve Transportation Problem by Least Cost Entry Method	**CO2**	**K3/ PO1**	**7**

	P	Q	R	Supply
A	7	8	8	50
B	9	6	9	40
Demand	60	40	30	

	b).	Solve Transportation Problem using Vogel's Approximation Method.	**CO2**	**K3/ PO1**	**7**

	D_1	D_2	D_3	
S_1	5	1	7	10
S_2	6	4	6	80
S_3	3	2	5	50
	75	20	50	

Unit-III

5.	**a).**	Explain the basic steps used in Hungarian method for assignment problem.	**CO3**	**K3/ PO1**	**4**
	b).	Solve the assignment problem.	**CO3**	**K3/ PO1**	**10**

	I	**II**	**III**	**IV**	**V**

			1	11	17	8	16	20			
			2	9	7	12	6	15			
			3	13	16	15	12	16			
			4	21	24	17	28	26			
			5	14	10	12	11	15			
OR											
6.	**a).**	Compare assignment and transportation problem.							**CO3**	**K3/ PO1**	**4**
	b).	Solve the assignment problem.							**CO3**	**K3/ PO1**	**10**
				I	**II**	**III**	**IV**	**V**			
			1	160	130	175	190	200			
			2	135	120	130	160	175			
			3	140	110	155	170	185			
			4	50	50	80	80	110			
			5	55	35	70	80	105			
Unit-IV											
7.	**a).**	Explain the terms : (i) Total float (ii) Optimistic time							**CO4**	**K3/ PO1**	**4**
	b).	A Project is composed of the following activities whose time estimates are listed below:							**CO4**	**K3/ PO1**	**10**

Activity (i – j)	Estimated duration (weeks)		
	Optimistic	Most likely	Pessimistic
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8

			2-5	1	1	1			
			3-5	2	5	14			
			4-6	2	5	8			
			5-6	3	6	15			
		(a) Draw the project network and calculate the early and late occurrence times for each event. (b) Find the critical path and its standard deviation. (c) What is the probability that the project will be completed 4 weeks earlier than expected?							
OR									
8.	**a).**	Explain Fulkerson's rule with suitable example.					**CO4**	**K3/ PO1**	**4**
	b).	A Project is composed of the following activities whose time estimates are listed below:					**CO4**	**K3/ PO1**	**10**

Activity	Predecessors	Estimated duration		
		Optimistic	Most likely	Pessimistic
A	-	5	6	7
B	-	1	3	5
C	-	1	4	7
D	A	1	2	3
E	B	1	2	9
F	C	1	5	9
G	C	2	2	8
H	E, F	4	4	10
I	D	2	5	8
J	H, G	2	2	8

(a) Draw the project network

(b) Calculate expected time and variance of each activity.

		(c) Find the critical path and its standard deviation.			
UNIT-V					
9.	**a).**	Distinguish between a pure strategy and mixed strategy of a rectangular game.	**CO5**	**K3/ PO1**	**4**
	b).	Solve the following game graphically, **Player-B** **Player-A** | 3 -3 4 / -1 1 -3	**CO5**	**K3, K4/ PO1 PO2**	**10**
OR					
10.	**a).**	What is a two-person zero-sum game? Define the saddle point of such a game.	**CO5**	**K3/ PO1**	**4**
	b).	Solve the following game, using the concept of dominance **Player-B** **Player-A** | **B_1 B_2 B_3 B_4** / **A_1** 8 10 9 14 / **A_2** 10 11 8 12 / **A_3** 13 12 14 13	**CO5**	**K3, K4/ PO1 PO2**	**10**

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SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
[B17EE4105]
IV B. Tech I Semester (R17) Regular Examinations
Elective-I: FLEXIBLE AC TRANSMISSION SYSTEM
ELECTRICAL AND ELECTRONICS ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
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			CO	KL/ PO	M
		UNIT-I			
1.	**a).**	Outline the necessity of reactive power in power system?	**CO1**	**K3/ PO1**	**7**
	b).	Explain the problems associated with synchronous condenser?	**CO1**	**K3/ PO1**	**7**
		OR			
2.	**a).**	Explain the operation of Thyristor-Switched Capacitor (TSC).	**CO2**	**K4/ PO2**	**7**
	b).	Explain the operation of Thyristor-Controlled Reactor (TCR).	**CO2**	**K4/ PO2**	**7**
		Unit-II			
3.	**a).**	Design the SVC voltage regulator based on system gain.	**CO3**	**K4/ PO3**	**14**
		OR			
4.	**a).**	Explain the Influence of SVC on system voltage	**CO3**	**K4/ PO2**	**7**
	b).	Outline the Enhancement of transient stability using SVC.	**CO4**	**K4/ PO2**	**7**
		Unit-III			
5.		Explain the operation of a STATCOM? Also derive the steady state model of it.	**CO3**	**K4/ PO2**	**14**
		OR			
6.	**a).**	Compare between SVC and STATCOM.	**CO3**	**K4/ PO2**	**7**
	b).	With a neat block diagram, explain the Sub-Synchronous Resonance (SSR) Mitigation by using STATCOM.	**CO4**	**K4/ PO2**	**7**
		Unit-IV			
7.		Explain the operation of TCSC. Also explain different modes of it.	**CO3**	**K4/ PO2**	**14**
		OR			
8.	**a).**	Discuss the variable reactance model of TCSC.	**CO3**	**K4/ PO2**	**7**
	b).	Discuss the system damping improvement using thyristor-controlled series capacitor (TCSC).	**CO5**	**K4/ PO2**	**7**
		UNIT-V			
9.	**a).**	With a neat block diagram, explain the Sub-Synchronous Resonance (SSR) Mitigation by using SSSC.	**CO5**	**K4/ PO2**	**7**
	b).	Compare between SSSC and TCSC.	**CO3**	**K4/ PO2**	**7**
		OR			

10.		Explain the operation of a SSSC with its control system.	**CO3**	**K4/ PO2**	**14**

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SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
[B17EE4106]
IV B. Tech I Semester (R17) Regular Examinations
Elective-I: INTEGRATION OF DISTRIBUTED GENERATION
ELECTRICAL AND ELECTRONICS ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**

All questions carry equal marks.

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			CO	KL/PO	M
		UNIT-I			
1.	**a).**	List the different reasons for new type of power production in the power system	**CO1**	**K3/PO1**	**7**
	b).	Explain persuasively how power is produced from wind list out the properties of wind power	**CO1**	**K3/PO1**	**7**
		OR			
2.	**a).**	Enumerate the main barriers to the wide scale use of renewable energy	**CO1**	**K3/PO1**	**7**
	b).	Briefly explain the different MPPT algorithms incorporated within the interface technology	**CO1**	**K3/PO1**	**7**
		UNIT-II			
3.	**a).**	With a neat figure explain two possible schemes of interfacing distributed generation to grid.	**CO2**	**K3/PO1**	**7**
	b).	Discuss four different approaches to prevent DG interfering with the ability of power system to fulfill its primary aims.	**CO2**	**K3/PO1**	**7**
		OR			
4.	**a).**	Explain direct machine coupling with the grid	**CO2**	**K3/PO1**	**7**
	b).	Write a note on power quality concerned to distributed generation	**CO2**	**K3/PO1**	**7**
		UNIT-III			
5.	**a).**	Outline the schemes used during connecting large generator unit into the network	**CO3**	**K3/PO1**	**7**
	b).	Briefly explain, how voltage magnitude variations impact the design of distributed generation	**CO3**	**K3/PO1**	**7**
		OR			
6.	**a).**	Explain Knowledge Server for Controllers (KSC) used in energy management system	**CO3**	**K3/PO1**	**7**
	b).	Explain basic design rules of distribution feeders	**CO3**	**K3/PO1**	**7**
		UNIT-IV			
7.	**a).**	Discuss how strong feeders increase the hosting capacity.	**CO4**	**K4/PO2**	**7**
	b).	List the various power quality disturbances developed due to distributed generation	**CO4**	**K4/PO2**	**7**
		OR			
8.	**a).**	Explain the dynamic voltage control used for increasing the hosting capacity	**CO4**	**K4/PO2**	**7**
	b).	Explain two main sources of unbalanced voltage at transmission level	**CO4**	**K4/PO2**	**7**

		UNIT-V			
9.	**a).**	What is the maximum permissible voltage distortion according to IEEE standard and briefly explain low frequency harmonics in distributed generation	**CO5**	**K4/PO2**	**7**
	b).	Summarize high frequency distortion as power quality disturbance	**CO5**	**K4/PO2**	**7**
		OR			
10.	**a).**	List the causes of voltage dips in distributed generation	**CO5**	**K4/PO2**	**7**
	b).	Outline the measures required to increase the hosting capacity when power quality disturbance sets the limit to distributed generation interconnection	**CO5**	**K4/PO2**	**7**

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SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
[B17EE4107]
IV B. Tech I Semester (R17) Regular Examinations
Elective-II: HIGH VOLTAGE ENGINEERING

ELECTRICAL AND ELECTRONICS ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
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			CO	KL/PO	M
		UNIT-I			
1.	**a).**	Explain the importance of electric field stress developed in insulatingmaterials.	**CO1**	**K2/ PO1**	**7**
	b).	Writetheadvantagesanddisadvantagesofthevariousnumericalmethods.	**CO1**	**K2/ PO1**	**7**
		OR			
2.	**a).**	Explain uniform and non–uniform field configuration of electrodes.	**CO1**	**K2/ PO1**	**7**
	b).	Define finite element method, briefly explain the four steps involved in thefinite element analysis of any problem.	**CO1**	**K4/ PO2**	**7**
		UNIT-II			
3.	**a).**	Explain Townsend's current growth equation.	**CO2**	**K4/ PO2**	**7**
	b).	Explain briefly about electro mechanical breakdown.	**CO2**	**K2/ PO1**	**7**
		OR			
4.	**a).**	Discuss about Paschen's law briefly.	**CO2**	**K4/ PO2**	**7**
	b).	Explain Breakdown in composite dielectrics	**CO2**	**K2/ PO1**	**7**
		UNIT-III			
5.	**a).**	With a neat diagram explain the working of Impulse Voltage generator.	**CO3**	**K4/ PO2**	**7**
	b).	Give the classification of different forms of high voltages.	**CO3**	**K2/ PO2**	**7**
		OR			
6.	**a).**	With a neat diagram explain the working of Vande Graff Generators.	**CO3**	**K4/ PO2**	**7**
	b).	Explain tripping and control of impulse generators	**CO3**	**K4/ PO2**	**7**
		UNIT-IV			
7.	**a).**	Explain the measurement of high dc voltages by connecting very high resistance in series with a micrometer. Also mention limitations in the series resistance.	**CO4**	**K4/ PO2**	**7**
	b).	Explain how Impulse current can be Measured.	**CO4**	**K4/ PO2**	**7**
		OR			
8.	**a).**	Explain the different methods of high d.c, a.c and impulse current measurement with their relative merits demerits.	**CO4**	**K2/ PO2**	**7**

	b).	Explain with neat diagram the principle of operation of an electrostatic voltmeter. Discuss its advantages and limitations for high voltage measurements.	**CO4**	**K4/ PO2**	**7**
		UNIT-V			
9.	**a).**	Draw the schematic diagram of electrostatic precipitator and explain.	**CO5**	**K4/ PO2**	**7**
	b).	Explain the industrial applications of high energy rate pulsed power generator.	**CO5**	**K4/ PO2**	**7**
		OR			
10.	**a).**	Explain Wheatstone bridge arrangement for resistivity measurement.	**CO5**	**K4/ PO2**	**7**
	b).	Draw the circuit for partial discharge measurement and explain how it works.	**CO5**	**K4/ PO2**	**7**

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SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
[B17EE4108]
IV B. Tech I Semester (R17) Regular Examinations
Elective-II: ELECTRIC POWER QUALITY
ELECTRICAL AND ELECTRONICS ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**

All questions carry equal marks.

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			CO	KL/ PO	M
		UNIT-I			
1.	**a).**	Define Power Quality? with a neat sketch explain different typesof power quality problems.	**CO1**	**K3/ PO1**	**7**
	b).	Explain the short-duration voltage variations. Compare short-duration voltage variations with long-duration voltage variations.	**CO1**	**K4/ PO2**	**7**
		OR			
2.	**a).**	What is the impact of transient on power quality? Classify the transients that occur in power systems.	**CO1**	**K3/ PO1**	**7**
	b).	Explain the following: a) Voltage Unbalance b) Waveform Distortion c) Voltage fluctuation Power Frequency Variations	**CO1**	**K3/ PO1**	**7**
		Unit-II			
3.	**a).**	Define voltage sag and voltage interruption. What is their impact on equipment connected? Discuss the sources of sags and interruptions	**CO2**	**K3/ PO1**	**7**
	b).	What are the main sources of transient over voltages? Explain the capacitor switching transient over voltages in detail.	**CO2**	**K3/ PO1**	**7**
		OR			
4.	**a).**	Explain and analyze various devices used for the protection of equipment from the over voltages due to transients	**CO2**	**K4/ PO2**	**7**
	b).	Discuss the principles of over voltage protection of load equipment	**CO2**	**PO1**	**7**
		Unit-III			
5.	**a).**	Explain the following harmonic indices in detail: (i) Total Harmonic Distortion (ii) Total Demand Distortion	**CO3**	**K3/ PO1**	**7**
	b).	What is the need of locating harmonic sources? Explain the power system response characteristics under the presence of harmonics.	**CO3**	**K3/ PO1**	**7**
		OR			
6.	**a).**	Discuss the impact of harmonic distortion on transformers and capacitors	**CO3**	**K3/ PO1**	**7**
	b).	Explain about the controlling of harmonics using passive and active filters. How active filters overcome the drawbacks of passive filters in controlling of harmonics.	**CO3**	**K4/ PO2**	**7**
		Unit-IV			
7.	**a).**	Discuss how the capacitors are used for voltage regulation in power systems in shunt and series configuration.	**CO4**	**K3/ PO1**	**7**
	b).	Analyze various devices used for voltage regulation in long duration	**CO4**	**K4/**	**7**

		voltage variation		**PO2**	
OR					
8.	**a).**	What is meant by voltage flicker. List some sources of flicker. Discuss the methods for mitigation of flicker.	**CO4**	**K3/ PO1**	**7**
	b).	Describe how utilities can deal with problems related to capacitor-switching transients.	**CO4**	**K4/ PO2**	**7**
UNIT-V					
9.	**a).**	Analyze the power quality issues when the DG is integrated to utility system	**CO5**	**K4/ PO2**	**7**
	b).	Explain how the utility voltage is regulated with distributed resources.	**CO5**	**K3/ PO1**	**7**
OR					
10.	**a).**	What are the problems that are noticed when the DG is interfaced to the utility system. Analyze the impact of DG interface to utility system.	**CO5**	**K4/ PO2**	**7**
	b).	Apply the solutions to wiring and grounding problems due to interconnection of DG to improve power quality.	**CO5**	**K3/ PO1**	**7**

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SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
[B17EE4109]
IV B. Tech I Semester (R17) Regular Examinations
Elective-II: ENERGY MANAGEMENT AND AUDITING

ELECTRICAL AND ELECTRONICS ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
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			CO	KL/ PO	M
		UNIT-I			
1.	**a).**	What is energy audit? What are the different types of audit?	**CO1**	**K3/ PO1**	**7**
	b).	What is a load profile? Explain about different types of load profile.	**CO1**	**K3/ PO1**	**7**
		OR			
2.	**a).**	What is an energy management? Explain the importance of energy management.	**CO1**	**K3/ PO1**	**7**
	b).	List the types of energy conservation methods and discuss their merits and demerits.	**CO1**	**K3/ PO1**	**7**
		Unit-II			
3.	**a).**	Discuss about the flood lighting scheme.	**CO2**	**K3/ PO1**	**7**
	b).	Brief out the conservation measures in lighting schemes.	**CO2**	**K4/ PO2**	**7**
		OR			
4.	**a).**	Explain the significance of polar curve.	**CO2**	**K4/ PO2**	**7**
	b).	How the existing lighting system is replaced for the improvement?	**CO2**	**K4/ PO2**	**7**
		Unit-III			
5.	**a).**	Compare the features of static capacitor and synchronous condenser used for power factor correction.	**CO3**	**K4/ PO2**	**7**
	b).	Discuss the effect of non linear loads on power factor.	**CO3**	**K4/ PO2**	**7**
		OR			
6.	**a).**	Discuss the vector diagram for a system where capacitor improves the power factor	**CO3**	**K3/ PO1**	**7**
	b).	Define harmonics. Discuss the effect of harmonics on the system power factor.	**CO3**	**K3/ PO1**	**7**
		Unit-IV			
7.	**a).**	Explain the principle of present worth method with an example.	**CO4**	**K4/ PO2**	**7**
	b).	Discuss the merits and demerits of time value of money	**CO4**	**K3/ PO1**	**7**
		OR			
8.	**a).**	Explain the principle of life cycle costing analysis with an example	**CO4**	**K4/ PO2**	**7**

	b).	Discuss the concept of energy efficient motors	**CO4**	**K3/ PO1**	**7**
UNIT-V					
9.	**a).**	Explain the net present worth method used for analysis of economics in energy management.	**CO5**	**K3/ PO1**	**7**
	b).	Explain the concept return on investment.	**CO5**	**K3/ PO1**	**7**
OR					
10.	**a).**	Discuss one application of life cycle costing analysis.	**CO5**	**K3/ PO1**	**7**
	b).	Explain the technologies adopted in energy efficient lighting systems.	**CO5**	**K4/ PO2**	**7**

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SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
[B17EE4201]
IV B. Tech II Semester (R17) Regular Examinations
ELECTRICAL MACHINE DESIGN
ELECTRICAL AND ELECTRONICS ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**

All questions carry equal marks.

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			CO	KL/PO	M
		UNIT-I			
1.	**a).**	Write the limitations involved in designing electrical machines	**CO1**	**K3/PO1**	**7**
	b).	Explain different methods for cooling of electrical machines?	**CO1**	**K3/PO1**	**7**
		OR			
2.		State and explain the factors which govern the choice of specific magnetic loading and specific electric loading.	**CO1**	**K3/PO1**	**14**
		UNIT-II			
3.	**a).**	Derive the output equation of a DC Machine in terms of its main dimensions.	**CO2**	**K4/PO3**	**7**
	b).	A A 4 pole wave wound armature has 230 conductors and 23 Commutator segments. Give the table of winding connections in terms of coin sides. Choose a Retrogressive winding.	**CO2**	**K4/PO3**	**7**
		OR			
4.	**a).**	List out the procedure involved in the design of shunt field winding and series field winding.	**CO2**	**K4/PO3**	**7**
	b).	A 4-pole, 25 HP, 500V, 600 rpm series motor has an efficiency of 82%. The pole faces are square and the ratio of pole arc to pole pitch is 0.67. Take B_{av}=0.58 wb/m^2 and ac=17000 ampere conductors/meter. Obtain the main dimensions of the core.	**CO2**	**K4/PO3**	**7**
		UNIT-III			
5.		Explain how heat generated in a transformer can be managed. Give a detailed scheme.	**CO3**	**K4/PO3**	**14**
		OR			
6.		Derive an expression for output in KVA in terms of its main dimensions for 3-phase transformer.	**CO3**	**K4/PO3**	**14**
		UNIT-IV			
7.	**a).**	Derive the output equation of an Induction motor.	**CO4**	**K4/PO3**	**7**
	b).	Find the value of diameter and length of stator core of a 7.5KW, 220V, 50Hz, 4 pole, 3-phase induction motor for best power factor. Magnetic loading=0/4 wb/m^2; Sp. Electric loading=22000A/m, Efficiency=0.86; power factor=0.87. core length/pole pitch= 1.0.	**CO4**	**K4/PO3**	**7**
		OR			

8.	**a).**	Write the rules for selecting stator and rotor slots of three phase slip ring induction motor?	**CO4**	**K4/PO3**	**7**
	b).	Determine the main dimensions, no of turns per phase, conductor cross section and slot area of a 250 HP, 3phase ,50HZ, 400v, 1410 rpm slip ring induction motor. Assume specific magnetic loading Bav=0.5T, specific electric loading ac=30000 ampere conductors per meter, efficiency is 90%, winding factor is 0.955, current density is 3.5 A/sq mm. The slot space factor is0.4 and ratio of core length to pole pitch is 1.2. The machine is delta connected	**CO4**	**K4/PO3**	**7**
UNIT-V					
9.	**a).**	Give the various factors to be considered for the selection of stator slots of a 3- phase alternator.	**CO5**	**K4/PO3**	**7**
	b).	Determine the main dimensions of a 25 MVA, 50 Hz, 3-phase turbo alternator, given mean gap density=0.5 Tesla, specific electric loading of 550 ampere conductors per cm. of armature periphery; peripheral speed should not exceed 145 m/s; Air gap is 3 cm.	**CO5**	**K4/PO3**	**7**
OR					
10.		Give the developed view for the R-phase of a 3-phase, 4 pole, 24 slots, and star connected lap winding with coil short pitched by one slot. Each slot contains two coil sides. Phase sequence is RYB.	**CO5**	**K4/PO3**	**14**

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
[B17EE4202]
IV B. Tech II Semester (R17) Regular Examinations
Elective-III: ELECTRICAL DISTRIBUTION SYSTEMS

ELECTRICAL AND ELECTRONICS ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
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			CO	KL/ PO	M
		UNIT-I			
1.	**a).**	Define and explain the following terms with suitable examples: (i) load factor, (ii) loss factor, (iii) Contribution factor and (iv) diversity factor.	**CO1**	**K3/ PO1**	**7**
	b).	A substation supplied the following loads: 175MW, 100MW, 75MW, 50MW and 10MW. The station has a maximum demand of 250MW. Determine the following, if annual load factor of the station is 45% (i) Number of units supplied annually (ii) Diversity factor (iii) Demand factor.	**CO1**	**K4/ PO2**	**7**
		OR			
2.	**a).**	Obtain the relation between load factor and lossfactor.	**CO1**	**K3/ PO1**	**7**
	b).	A substation is to supply three regions of loads whose maximum values are 6000kW,10000kWand5000kW.Thediversityfactoroftheloadatthesub stationis 1.5 and the average annual load factor is 0.65. Calculate the peak demand on the substation and annual energy supplied fromthe substation.	**CO1**	**K4/ PO2**	**7**
		Unit-II			
3.	**a).**	What are the various factors that are to be considered in selecting primary feeder rating? Give a neat sketch of typical primary distribution feeder.	**CO2**	**K3/ PO1**	**7**
	b).	Derive the percentage voltage drop of a substation service area with 'n' number of primary feeders.	**CO2**	**K3/ PO1**	**7**
		OR			
4.	**a).**	What are the types of basic distribution system?Explain.	**CO2**	**K3/ PO1**	**7**
	b).	Draw the single line diagram of radial type primary feeder and mention the factors that influence the selection ofprimaryfeeder.	**CO2**	**K3/ PO1**	**7**
		Unit-III			
5.	**a).**	Obtain the expression for voltage drop and power loss for uniformly radial type distribution load.	**CO3**	**K4/ PO2**	**7**
	b).	If Z1 = 15 $\angle$ -300 , Z2 = 20 $\angle$ 800 and Z3 = 20 $\angle$ +900 are the impedances connected in the form of delta and the supply voltage is	**CO3**	**K4/ PO2**	**7**

		400V. Assume the RBY sequence and so find the phase currents, line currents and the total power absorbed.			
OR					
6.	**a).**	Derive the expression for voltage drop and power loss for non-uniformly radial type distribution load.	**CO3**	**K4/ PO1 PO2**	**7**
	b).	Assume that a star connected three-phase load is made up of three impedances of $50\angle 25^0$ ohms each and that the load is supplied by a 3-phase, four wire primary feeder. The balanced line to neutral voltages at the receiving end are: $V_{an}=7630\angle 0^0$ V, $V_{bn}=7630\angle 240^0$ V and $V_{cn}=7630\angle 120^0$. Determine the a) The phase currents in each line and (b) The total active and reactive power supplied totheload.	**CO3**	**K4/ PO2**	**7**
Unit-IV					
7.	**a).**	How is the coordination between main fuse and sectional fuse achieved with neat diagram?	**CO4**	**K3/ PO1**	**7**
	b).	What are the common faults in a single phase, 2-wire and 3-wire system? Explain how fault current is computed with single line diagram.	**CO4**	**K3/ PO1**	**7**
OR					
8.	**a).**	Explain the coordination procedure between recloser andfuse.	**CO4**	**K3/ PO1**	**7**
	b).	What are the main objectives of distribution systemprotection?Discuss.	**CO4**	**K3/ PO1**	**7**
UNIT-V					
9.	**a).**	How is economical p.f arrived at for a given distribution system with different loads.	**CO5**	**K3/ PO1**	**7**
	b).	Give the best values of capacitor banks to improve the load p.f. from 0.75 to 0.9 from the following data: Load 800 kVA, operating voltage 3.3 kV (i) Star connection and (ii) Delta connection.	**CO5**	**K4/ PO2**	**7**
OR					
10.	**a).**	Explain the necessity of voltage control and p.f. correction in distribution systems.	**CO5**	**K3/ PO1**	**7**
	b).	What are the numerous ways to improve the distribution system's overall voltage regulation? How is line drop compensation made?	**CO5**	**K3/ PO1**	**7**

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IV B. Tech II Semester (R17) Regular Examinations

Elective-III: UTILIZATION OF ELECTRICAL ENERGY& TRACTION

ELECTRICAL AND ELECTRONICS ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**

All questions carry equal marks.

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			CO	KL/ PO	M
UNIT-I					
1.	**a).**	Explain the advantages of electric heating..	**CO1**	**K3/ PO1**	**7**
	b).	With a neat diagram, explain the working of metallic Arc welding.	**CO1**	**K3/ PO1**	**7**
OR					
2.	**a).**	Compare between AC welding and DC welding	**CO1**	**K3/ PO1**	**7**
	b).	Explain the principle of dielectric heating. Also write the applications of Dielectric heating.	**CO1**	**K3/ PO1**	**7**
UNIT-II					
3.	**a).**	Define inverse square law and cosine cube law of illumination.	**CO2**	**K3/ PO1**	**7**
	b).	A lamp giving 300 C.P in all directions below horizontal is suspended 2m above the centre of a square table of 1m side. Calculate the maximum and minimum illumination on the surface of the table.	**CO2**	**K4/ PO2**	**7**
OR					
4.	**a).**	What is photometry? Explain photovoltaic method of photometry.	**CO2**	**K3/ PO1**	**7**
	b).	A lamp with mean spherical candle power of 1000 is suspended at a height of 1.2m. Determine i) total flux emitted by the lamp ii) the illumination just below the lamp.	**CO2**	**K4/ PO2**	**7**
UNIT-III					
5.	**a).**	Sketch the typical speed-time curves for mainline service and suburban service with electric traction.	**CO3**	**K3/ PO1**	**7**
	b).	Explain Regenerative braking applied to 3- Φ induction motor. Also mention their advantages.	**CO3**	**K3/ PO1**	**7**
OR					
6.	**a).**	List and explain different braking schemes used in electric traction drives. Also mention their advantages and disadvantages.	**CO3**	**K4/ PO2**	**14**
UNIT-IV					
7.	**a).**	What is specific energy consumption of a train? Explain various factors affecting it.	**CO4**	**K3/ PO1**	**7**
	b).	A suburban train runs with an average speed of 36 kmph between two stations 1.8 km apart. The values of acceleration and retardation are 1.8 kmphps and 3.6 kmphps. Calculate the maximum speed of the	**CO4**	**K4/ PO2**	**7**

		train assuming trapezoidal speed-time curve.			
OR					
8.	**a).**	An electric train has an average speed of 42 kmph on a level track between stops 1400 m apart. It is accelerated at 1.7 kmphps and it is braked at 3.3 kmphps. Draw the speed time curve for the run. Estimate energy consumption at the axels of the train per tonne per km. Take the tractive resistance constant at 50 Newton per tonne and allow 10 percent rotational inertia.	**CO4**	**K4/ PO2**	**7**
	b).	Define the following Adhesive Weight, Coefficient of Adhesion and Tractive Effort. Explain what are the factors that affect them.	**CO4**	**K4/ PO2**	**7**
UNIT-V					
9.	**a).**	What are the factors effecting the quality of electro deposition.	**CO5**	**K3/ PO1**	**7**
	b).	Explain the vapour compression and vapour absorption refrigeration systems.	**CO5**	**K3/ PO1**	**7**
OR					
10.		Give a neat sketch of the electrical circuit used in (i) water cooler and (ii) refrigerator	**CO5**	**K3/ PO1**	**14**

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Elective-III: HVDC TRANSMISSION
ELECTRICAL AND ELECTRONICS ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs. **Max. Marks: 70 M**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.
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			CO	KL/ PO	M
UNIT-I					
1.	**a).**	Explain in detail about general considerations of hvdc transmission systems	**CO1**	**K3/ PO1**	**7**
	b).	Explain in detail about power handling capabilities of hvdc transmission systems	**CO1**	**K3/ PO1**	**7**
		OR			
2.	**a).**	Explain in detail about basic conversion principles in hvdc transmission	**CO1**	**K3/ PO1**	**7**
	b).	Explain in detail about static power converter configurations	**CO1**	**K3/ PO1**	**7**
		UNIT-II			
3.	**a).**	Explain about 3pulse and 6 pulse converters in hvdc transmission systems.	**CO2**	**K3/ PO1**	**7**
	b).	Explain about 12 pulse converters and operation of rectifier and inverter in hvdc transmission systems.	**CO2**	**K3/ PO1**	**7**
		OR			
4.	**a).**	Explain about commutation process in hvdc converters	**CO2**	**K3/ PO1**	**7**
	b).	Explain about rectifier and inverter operation with equivalent circuits in hvdc transmission systems.	**CO2**	**K3/ PO1**	**7**
		UNIT-III			
5.		Explain in detail about harmonics in hvdc transmission systems	**CO3**	**K3/ PO1**	**14**
		OR			
6.		Explain in detail about filters to eliminate harmonics in hvdc transmission systems	**CO3**	**K3/ PO1**	**14**
		UNIT-IV			
7.		Explain in detail about Constant current and constant extinction angle control in hvdc transmission systems	**CO4**	**K3/ PO1**	**14**
		OR			
8.		Explain in detail about equidistant angle control and dc power flow in hvdc transmission systems	**CO4**	**K3/ PO1**	**14**
		UNIT-V			

9.		Explain in detail about Interaction between HVDC and HVAC systems	**CO5**	**K3/ PO1**	**14**
OR					
10.		Explain in detail about Voltage interaction, Harmonic instabilityproblems in hvdc transmission systems.	**CO5**	**K3/ PO1**	**14**

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