Hall Ticket Number :										

R-15

Code: 5G254

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Electrical and Electronic Measurements

(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)	Elucidate the different errors possible in an instrument	10M	1	L2
	b)	Explain the classification of an analog instrument with an example	4M	1	L2
		OR			
2.		Describe the construction and working of Dynamometer type instrument along with neat diagram. Also derive the expression for torque	14M	1	L2
		UNIT–II			
3.		What are the different methods of connections in wattmeter and explain them in detail. Also suggest which method of connection is best and why	14M	2	L1
		OR			
4.	a)	Explain the construction and working of single phase induction type energy meter along with a neat diagram	10M	2	L2
	b)	Explain about Creeping error in single phase induction type energy meter	4M	2	L2
		UNIT–III			
5.	a)	List the applications of DC Potentiometer and explain any one in detail	7M	3	L1
	b)	Discuss how to measure the self-reactance of coil using potentiometer	7M	3	L2
		OR			
6.		Explain the construction and working principle of Drysdale Polar AC potentiometer	14M	3	L2
		UNIT–IV			
7.	a)	List out the different methods available to measure low resistance	4M	4	L1
	b)	Explain the process of measuring low resistance using Kelvin Double Bridge	10M	4	L2
		OR			
8.	a)	List out the advantages of bridges	4M	4	L1
	b)	Determine the unknown capacitance using Schering Bridge with phasor diagram representation. Also determine the value of Dissipation factor	10M	4	L3
		UNIT–V			
9.	a)	Draw the Ramp type DVM and explain in detail	10M	5	L2
	b)	What is the purpose of Time Base Generator in CRO	4M	5	L1
		OR			
10.		Describe the operation of Successive Approximation type DVM with its block diagram and list out the advantages of the same	14M	5	L2

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Hall Ticket Number :										

R-15

Code: 5G251

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Electrical Machines-III

(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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UNIT–I

1. a) A 3-Ph, 50Hz, 8 pole alternator has a star connected winding with 120 slots and 8 conductors/slot. The flux per pole is 0.05wb, sinusoidally distributed. Determine the phase and line voltages. Let the winding factor as 0.956. 8M

   b) Explain in detail about the constructional features of round rotor synchronous machines. 6M

OR

2. a) Develop the expression for distribution factor of a 3-Ph synchronous machine from fundamental. 7M

   b) Determine the distribution factor for 1-Ph alternator having 6 slots/pole
   (i) When all the slots are wound.
   (ii) When only four adjacent slots/pole are wound. 7M

UNIT–II

3. With the help neat diagram, explain how OC and ZPF tests are conducted. Explain the procedure to find the regulation using ZPF method. 14M

OR

4. Discuss in brief about two reaction analysis of salient pole machine. How the voltage regulation can be computed for salient pole machine. 14M

UNIT–III

5. a) What is an infinite bus? Mention the conditions to be satisfied prior to synchronizing an alternator to infinite bus bar. 7M

   b) A 10MVA 3-ph alternator has a reactance of 20%. Calculate the total synchronizing power of armature per mechanical degree of phase displacement when running in parallel on 10KV, 50Hz bus at 1500rpm. 7M

OR

6. a) Discuss the effect of change of excitation of alternator when it is connected to Infinite bus bar. 7M

   b) Derive the load currents shared by two similar alternators when they are connected in parallel. 7M

UNIT–IV

7. a) State the main features of synchronous motor. Mention its applications. 7M

   b) Explain why the 3–Ph synchronous motor is not a self-starting motor? 7M

OR

8. What do you mean by constant power circles of synchronous motor? How it derived? 14M

UNIT–V

9. Explain about capacitor start capacitor run motors of a single phase induction motor. Draw its torque-slip characteristics. Also mention its merits and demerits. 14M

OR

10. Suggest and explain the modifications required to operate the DC series motor on AC supply. 14M

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Hall Ticket Number :										

R-15

Code: 5G253

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Power Electronics

(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	Blooms Level
		UNIT–I			
1.	a)	Describe the UJT triggering circuit with neat sketch.	7M	1	2
	b)	Discuss series connection of SCRs.	7M	1	2
		OR			
2.		Discuss the different modes of operation of thyristor with the help of its static V-I characteristics.	14M	1	3
		UNIT–II			
3.		Explain briefly the specifications and ratings of SCRs.	14M	2	2
		OR			
4.	a)	Explain briefly over current protection by fast acting current limiting fuse.	7M	2	4
	b)	Show the improvement of dv/dt rating with the help of cathode short structure.	7M	2	4
		UNIT–III			
5.		Describe the operation of three phase semi converter with R load and also draw the output voltage waveforms	14M	3	2
		OR			
6.		Draw and explain the three phase bridge type 6 pulse converter with 'RL' load with neat circuit diagram and necessary wave forms also derive Average output voltage.	14M	3	3
		UNIT–IV			
7.		Explain the operation of step up chopper and derive an expression for its output voltage	14M	4	2
		OR			
8.		Analyze the four quadrant operation of chopper for continuous current conduction mode with neat circuit diagram.	14M	4	4
		UNIT–V			
9.		Differentiate CSI and VSI.	14M	5	2
		OR			
10.		Demonstrate the working of a single phase full bridge inverter supplying RL load with relevant circuit and waveforms.	14M	5	3

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Hall Ticket Number :										

R-15

Code: 5G252

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Transmission of Electric 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			
1.		Determine the total reactive power of the line when the conductors of the line are forming a triangle whose sides are 4, 6 and 8m. Assume the diameter of the conductor as 1.2cm and the operating phase voltage is 220KV.	14M	1	5
		OR			
2.		Prove that Inductance/ph of 3-phase hexagonally spaced double circuit line is same with GMD-GMR method and Flux linkage method	14M	1	5
		UNIT–II			
3.		Discuss in detail the nominal-T representation with neat circuit diagram and phasor diagram. Derive also its performance specifications.	14M	2	2
		OR			
4.		A 3- Ø 50Hz 150km transmission line delivers 50 MW at 132 KV and 0.8 pf lagging. The Resistance and reactance of the line per phase per km are 0.1 Ω and 2 Ω respectively. The line admittance is 1.3X10-6 ʊ/km/ph. Compute Voltage Regulation and Transmission Efficiency by applying nominal T Method.	14M	2	3
		UNIT–III			
5.		Discuss in detail the different mathematical methods for obtaining ABCD constants of long line.	14M	2	2
		OR			
6.	a)	Give the reasons why the resistance and inductance are considered as series elements and why the capacitance and conductance are considered as shunt parameters.	4M	2	2
	b)	What is the difference between lumped parameters and distributed parameters?	3M	2	1
	c)	Define Characteristic Impedance, Attenuation Constant and Phase Constant and also give their mathematical Expressions.	7M	2	1
		UNIT–IV			
7.		With neat sketches describe the travelling of the wave for open and short circuited ends at different time instants.	14M	3	4
		OR			
8.	a)	Define the following i) Reflection ii) Refraction iii) Attenuation iv)Distortion	7M	3	1
	b)	Explain the phenomenon of wave travelling from sending end to receiving end.	7M	3	2
		UNIT–V			
9.		What are the various types of insulators used for overhead transmission system? 4I48;7x;/19I plain each of them and their applications.	14M	4	1
		OR			
10.		Define String Efficiency? Discuss the different methods of improving string efficiency?	14M	4	1

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