Code: 19A242T

II B.Tech. II Semester Supplementary Examinations July/August 2022

Electromagnetic Fields

(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)	State coulomb's law and derive the force equation for 'n' number of charges using superposition principle.	10M	CO1	L3
	b)	Explain charge distribution in electrostatic fields.	4M	CO1	L1
		OR			
2.	a)	State and derive the point form of Maxwell's first equation	9M	CO1	L2
	b)	Calculate the absolute potentials at distance r=40cm and 10cm from a charge Q=0.2µC.	5M	CO1	L2
		UNIT–II			
3.	a)	Derive an expression per energy density in an electro static field.	10M	CO1	L3
	b)	Describe dipole and dipole moment.	4M	CO1	L2
		OR			
4.	a)	Describe the conduction current density and conventional current density.	7M	CO2	L2
	b)	The point charges -2nC, 8nC, and 6nC are located at (0,0,0) (0,0,2), and (2,0,0)respectively. Find energy in system.	7M	CO1	L2
		UNIT–III			
5.	a)	Develop an expression for MFI at any point along the axis of the solenoid coli wound a non-magnetic frame Using Biot-savart law.	8M	CO3	L3
	b)	The solenoid has 2000 turns, a length of 75cm, and a radius of 5 cm. If it carries a current of 50mA. Calculate H at any one end of solenoid.	6M	CO3	L3
		OR			
6.	a)	Define scalar magnetic potential and list out its limitation.	7M	CO3	L1
	b)	In a current free region of relative permittivity is 1, the magnetic scalar potential is given as $V_m = x^2y + y^2x + z$. Evaluate the magnitude of magnetic flux density at (1,1,1)	7M	CO3	L3
		UNIT–IV			
7.	a)	Derive an expression for Lorentz force equation.	7M	CO3	L3
	b)	Determine the Magnitude of magnetic force on a conductor oriented from O (0,0,0) to A (0.6,0,0) carrying a current of 8mA placed in a field $\vec{B} = 0.2a_x - 0.6a_y + 0.2a_z$ T.	7M	CO3	L3
		OR			
8.	a)	Derive the expression for energy stored and energy density in a magnetic field.	14M	CO3	L3
		UNIT–V			
9.	a)	State and explain Maxwell's equations for time varying field in integral and point form in free space.	14M	CO5	L2
		OR			
10.	a)	State Maxwell's equations, and obtain them in differential form.	7M	CO5	L2
	b)	In a material for which = 8 S/m and $_r$ = 1, the electric field intensity is E = 200sin1010t V/m. find the conduction and displacement current densities.	7M	CO5	L3

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R-19

Code: 19A25DT

III B.Tech. I Semester Supplementary Examinations July 2022

Fuzzy Logic and Neural Network

(Electrical and Electronics Engineering)

Max. Marks: 70　　　　　　　　　　　　　　　　　　　　　　　Time: 3 Hours

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

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		Marks	CO	Blooms Level
	UNIT-I			
1. a)	What is the role of membership function in fuzzy logic? Mention various membership functions.	7M	CO1	L2
b)	Explain the basic fuzzy set operations on fuzzy relations.	7M	CO1	L2
	OR			
2. a)	Explain the properties of Fuzzy sets.	7M	CO1	L2
b)	Compare and contrast fuzzy logic control and classical control system	7M	CO1	L2
	UNIT-II			
3. a)	How do you convert a fuzzy set to single crisp value and discuss the methods to be used?	7M	CO2	L2
b)	With a neat sketch discuss the major components of fuzzy logic system.	7M	CO2	L2
	OR			
4. a)	Explain the properties of commutativity, associativity, distrubutivity, idempotence and identity with respect to crisp sets and fuzzy sets	7M	CO2	L2
b)	List the various defuzzification techniques. Explain each of them in detail.	7M	CO2	L2
	UNIT-III			
5. a)	List out the differences between supervised and unsupervised learning with a neat sketch	7M	CO3	L1
b)	Explain what is an artificial neural network and show how a basic ANN is constructed from a biological neuron concept	7M	CO3	L1
	OR			
6. a)	Explain with neat sketch the McCulloch-Pitts model of artificial neural network?	7M	CO3	L4
b)	Explain the architecture of spiking-neuron model.	7M	CO3	L4
	UNIT-IV			
7.	State and prove perceptron convergence theorem	14M	CO4	L4
	OR			
8. a)	What are the steps involved in the backpropagation algorithm? Explain	7M	CO4	L4
b)	What are learning difficulties in backpropagation and how do you overcome it?	7M	CO4	L4
	UNIT-V			
9.	Describe how a neural network may be trained for a load forecasting task. Illustrate with an example.	14M	CO5	L3
	OR			
10.	Write short notes on Neural network and fuzzy logic applications to Power system.	14M	CO5	L3

END

Code: 19A354T

III B.Tech. I Semester Supplementary Examinations July 2022

Management Science

(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.	What is meant by Management? Explain its functions.	14M	C01	L2
	OR			
2.	Discuss about the evolution of scientific management and modern management.	14M	C01	L1
UNIT–II				
3.	What is meant by inventory management? Explain its objectives.	14M	C02	L1
	OR			
4. a)	Marketing Mix	7M	C02	L1
b)	Channels of distribution	7M	C02	L2
UNIT–III				
5. a)	Significance of Human Resource Management	7M	C03	L1
b)	Functions of Human Resource Management	7M	C03	L1
	OR			
6.	Discuss the role of Training and Development for enterprise growth.	14M	C03	L2
UNIT–IV				
7. a)	Write short notes on Working Capital.	7M	C04	L3
b)	Write short notes on Cost of Capital.	7M	C04	L3
	OR			
8. a)	Explain about How to draw the network diagram.	7M	C04	L3
b)	Explain in detail Critical Path Method (CPM).	7M	C04	L3
UNIT–V				
9.	Discuss about Enterprise Resource Planning.	14M	C05	L2
	OR			
10.	Discuss about Total Quality Management (TQM) And Supply Chain Management.	14M	C05	L2

END

Code: 19A252T

III B.Tech. I Semester Supplementary Examinations July 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)	Draw and explain dynamic characteristics of a thyristor during its turn-on processes.	7M	CO1	L2
	b)	Describe any two methods of forced Commutation for SCR.	7M	CO1	L2
		OR			
2.	a)	SCRs with rating of 1000v and 200A are available to be used in a string to handle 6kV and 1kA. Calculate the number of series and parallel units required in case de-rating factor is 0.2 and 0.3.	7M	CO1	L3
	b)	Describe RC triggering circuit to trigger SCRs.	7M	CO1	L2
		UNIT-II			
3.	a)	Describe the mechanism of over voltage protection of SCR by Metal Oxide Varistors.	7M	CO2	L2
	b)	Discuss voltage, current and power ratings of SCR.	7M	CO2	L2
		OR			
4.	a)	Demonstrate a method to protect a SCR against dv/dt problems.	7M	CO2	L2
	b)	Demonstrate Gate Protection method.	7M	CO2	L2
		UNIT-III			
5.		Explain the operation of Single Phase half controlled rectifier with R-load and draw the wave forms. Derive the average output voltage for the above operation.	14M	CO3	L2
		OR			
6.	a)	What is the effect of source inductance on the performance of Single Phase fully controlled converter? Discuss with neat sketches.	7M	CO3	L2
	b)	Explain briefly the different modes of operation of three phase dual converter.	7M	CO3	L2
		UNIT-IV			
7.	a)	With neat sketch, explain the operation of Buck-Boost converter and also derive the equation for output voltage.	10M	CO4	L2
	b)	What are the applications of dc-dc choppers?	4M	CO4	L2
		OR			
8.	a)	Explain about Step-down chopper and derive the output voltage equation.	8M	CO4	L2
	b)	Explain time ratio and current limit control strategies of DC Choppers.	6M	CO4	L2
		UNIT-V			
9.	a)	With neat sketch explain Single phase AC voltage controller for R-load. Derive RMS load voltage and current.	7M	CO5	L2
	b)	Explain the working of a single phase bridge type cyclo-converter for RL-load of frequency $f_0 = \frac{1}{4}f_s$ with continuous conduction mode.	7M	CO5	L3
		OR			
10.		Explain the principle of operation of three-phase inverter with 180^0 conduction mode with necessary wave forms & circuit.	14M	CO5	L2

END

R-19

Code: 19A253T

III B.Tech. I Semester Supplmentary Examinations July 2022

Power System Analysis

(Electrical and Electronics Engineering)

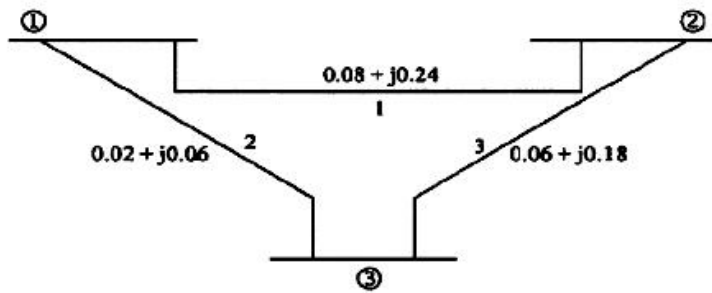Max. Marks: 70   Time: 3 Hours

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

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		Marks	CO	Blooms Level

UNIT–I

1. a) Explain the formation of Y_{Bus} using Singular Transformation Method — 7M CO1 L2

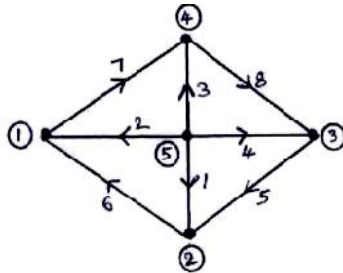   b) For the 3-bus system shown in the figure, Obtain Z_{bus}?

   7M CO1 L3

OR

2. a) Find the bus incidence matrix for the following network?


   7M CO1 L2

   b) Explain the modifications necessary in the Z_{BUS} when a mutually coupled element is removed or its impedance is changed. — 7M CO1 L2

UNIT–II

3. a) With the help of a neat flow chart, explain the Newton-Raphson method of load flow solution when the system contains voltage controlled busses in addition to swing bus and load bus. — 7M CO2 L2

   b) Perform one iteration of FDLF method for the system shown in figure.
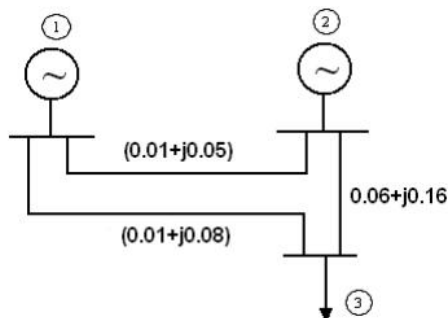
   7M CO2 L3

OR

4. a) What are the works involved in a load flow study? — 7M CO2 L1
    b) Develop an algorithm for G-S load flow method including PV buses in the power system. — 7M CO2 L2

UNIT–III

5. a) What do you understand by sequence networks? What is their importance in unsymmetrical fault calculations? — 7M CO3 L1
    b) A 25 MVA, 13.2 kV alternator with solidly grounded neutral has a sub transient reactance of 0.25 p.u. The negative and zero sequence reactance's are 0.35 and 0.1 p.u. respectively. A single line to ground fault occurs at the terminals of an unloaded alternator; determine the fault current and the line-to-line voltages. Neglect resistance. — 7M CO3 L3

OR

6. a) Explain in detail about the steps to be followed for the symmetrical fault calculations. — 7M CO3 L2
    b) Draw and explain the positive, negative, zero sequence impedance diagrams for different 3-phase transformer winding connections. — 7M CO3 L2

UNIT–IV

7. a) Define steady state stability limit. — 7M CO4 L1
    b) Derive steady state stability limit of a line with generalised circuit constants of A, B, C and D if sending end and receiving end voltages are V_S and V_R. — 7M CO4 L2

OR

8. a) Derive the expression for the maximum power transfer from the steady state power — 7M CO4 L2
    b) An alternator supplies 50 MW to the infinite bus bar, the steady state limit of the system being 100 MW. Determine whether the alternator will remain the synchronism if the prime mover input is increased to 32 MW by assuming the losses are zero. — 7M CO4 L3

UNIT–V

9. a) What are the assumptions made in deriving swing equation and derive the equation. — 7M CO4 L1
    b) Explain Solution of Swing equation by point by point method. — 7M CO4 L2

OR

10. a) Explain the latest methods to improve the transient state stability — 7M CO4 L2
    b) Explain equal area criterion in detail and write its limitations. — 7M CO4 L2

END

III B.Tech. I Semester Supplementary Examinations July 2022
Renewable Energy Systems
(Electrical and Electronics Engineering)

Max. Marks: 70   Time: 3 Hours

Answer any *five full* questions by choosing one question from each unit (5 x 14 = 70Marks)
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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	How are renewable energy sources classified?	7M	1	3
	b)	Elucidate the principle of operation of sun shine recorder	7M	2	3
		OR			
2.	a)	Explain in brief about spectral distribution of solar energy	7M	2	2
	b)	Write a brief note on the various types of solar radiation	7M	2	2
		UNIT–II			
3.	a)	Explain in detail with neat sketch the construction and operation of flat plate collector	7M	3	2
	b)	Describe the process of photovoltaic energy conversion	7M	3	3
		OR			
4.	a)	Expound the necessity of energy storage methods and explain the thermo chemical type of energy storage	7M	3	3
	b)	Illustrate with a neat diagram and explain in detail the operating principle of solar drying	7M	3	4
		UNIT–III			
5.	a)	Explicate the various site selection consideration parameters for WECS	7M	4	3
	b)	Expound in brief the performance characteristics of wind machines	7M	4	3
		OR			
6.	a)	Discuss the advantages and disadvantages of WECS	7M	4	2
	b)	Demonstrate with a neat block diagram the working of the various parts of WECS	7M	4	3
		UNIT–IV			
7.	a)	Present a short outline on closed and open cycle operation of ocean thermal energy power plant	7M	5	4
	b)	Explain in detail the factors affecting wave energy	7M	5	2
		OR			
8.		Describe in detail the various types of tidal power plants. List its advantages and disadvantages	14M	5	3
		UNIT–V			
9.	a)	Differentiate between anaerobic and aerobic digestion	7M	5	3
	b)	Describe elaborately any one method of harnessing Geothermal energy	7M	5	3
		OR			
10.	a)	Elucidate in detail the principle of operation of any one type of Bio-gas digesters	7M	5	3
	b)	Write short note on the various types and application of fuel cells	7M	5	3

END

R-19

Code: 19A251T

III B.Tech. I Semester Supplementary Examinations July 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 (5 x 14 = 70Marks)

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		Marks	CO	Blooms Level

UNIT–I

1. a) What are the classifications of instruments? — 4M, 1, 1

   b) Derive the equation for deflection if the instrument is PMMC (i) spring controlled (ii) gravity controlled? — 10M, 1, 3

OR

2. a) Discuss the different methods of specifying the results of measurements? — 7M, 1, 2

   b) Describe the working of a universal shunt uses for multi-range ammeters. Derive expressions for resistances of different sections of a universal shunt used for a 3 range ammeter? — 7M, 1, 2

UNIT–II

3. a) Describe the constructional details of an Electrodynamometer type wattmeter. Derive the expression for torque when the instrument is used on a.c. Explain why it is necessary to make the potential coil circuit purely resistive? — 7M, 2, 2

   b) What is Phantom loading? Explain with an example how it is more advantageous when testing with direct loading. — 7M, 2, 2

OR

4. a) Describe the construction and working of a two element Induction type energy meter. — 7M, 2, 2

   b) The power flowing in a 3 phase, 3 wire balanced load system is measured by two wattmeter method. The reading of wattmeter A is 7500 W and of wattmeter B is -1500 W. what is the power factor of the system? If the voltage of the circuit is 400 V, what is the value of capacitance which must be introduced in each phase to cause the whole of the power measured to appear on wattmeter A? the frequency is 50 Hz. — 7M, 2, 3

UNIT–III

5. a) Explain the term "standardization:, of a potentiometer. Describe the procedure of standardization of a d.c. potentiometer. — 7M, 2, 2

   b) Draw the equivalent circuit and phase diagram of a potential transformer. Derive the expressions for its ratio and phase angle errors. Describe the assumptions made for derivation of errors. — 7M, 2, 2

OR

6. a) Describe the construction and working of a polar type potentiometer. How it is standardized? 7M 2 2

   b) Explain the Wilson Compensation Method for reductions of errors in current transformers. 7M 2 2

UNIT–IV

7. a) Explain the loss of charge method for measurements of insulation resistance of cables. 7M 3 2

   b) Describe the working of a low voltage Schering bridge. Derive the equations for capacitance and dissipation factor. 7M 3 2

OR

8. a) Draw the circuit of a Kelvin's Double Bridge used for measurement of low resistances. Derive the condition for balance. 7M 3 2

   b) Explain why Maxwell's inductance-capacitance bridge is useful for measurement of inductance of coils having storage factor between 1 and 10. 7M 3 2

UNIT–V

9. a) Derive an expression for vertical deflection of an electron beam in a CRT 7M 4 3

   b) With the help of a neat sketch explain the construction and working of smart energy meter. 7M 4 2

OR

10. a) Explain the functioning of a time base generator in a CRO. 7M 4 2

    b) Enumerate with a block diagram the various elements involved in a digital data acquisition system. Why multiplexers and scanners are important in this type of data acquisition system? 7M 4 2

END