SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF

ELECTRICAL AND ELECTRONICS ENGINEERING

&

ELECTRONICS AND INSTRUMENTATION ENGINEERING

QUESTION BANK

I SEMESTER

GE3131 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Regulation – 2023

Academic Year 2024–20245 (ODD)

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SRM Nagar, Kattankulathur – 603 203.
Department of Electrical and Electronics Engineering

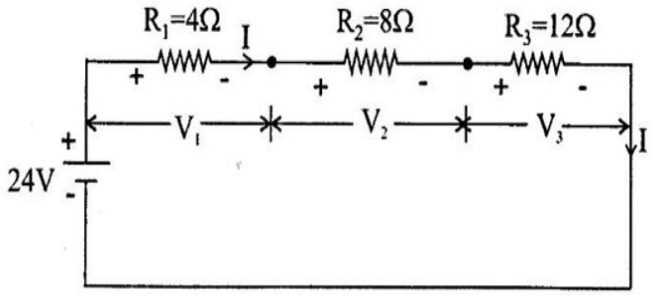
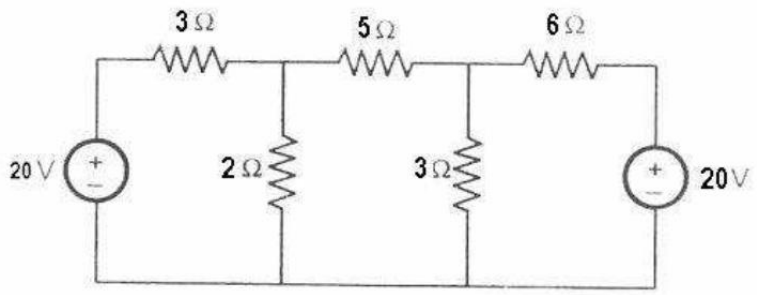
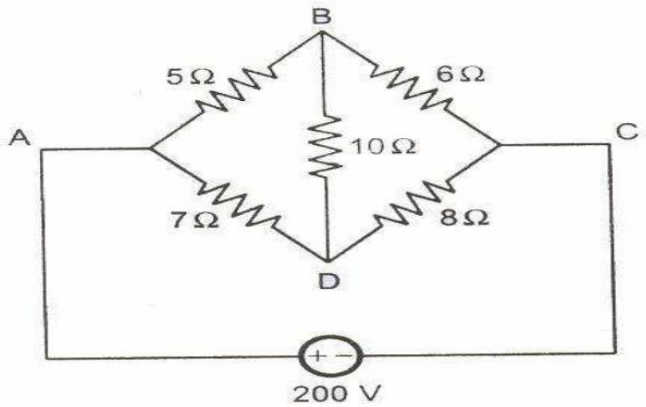
SUBJECT : GE3131–BASIC ELECTRICAL AND ELECTRONCS ENGINEERING.
SEM / YEAR: I / I

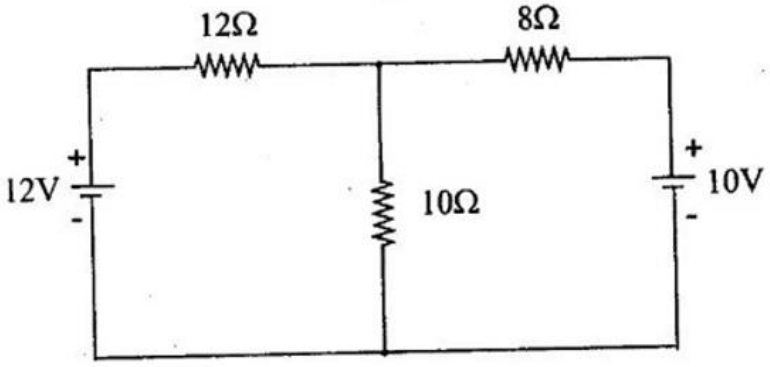
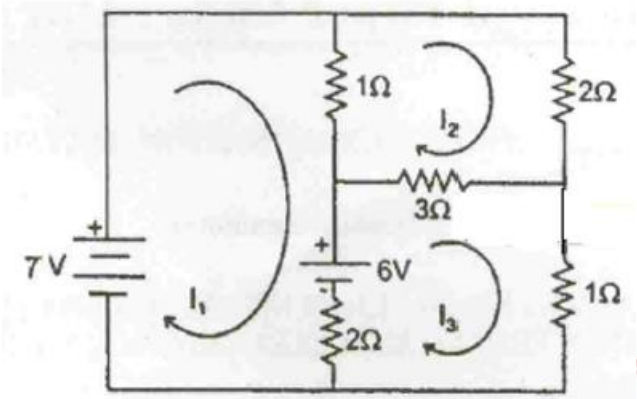
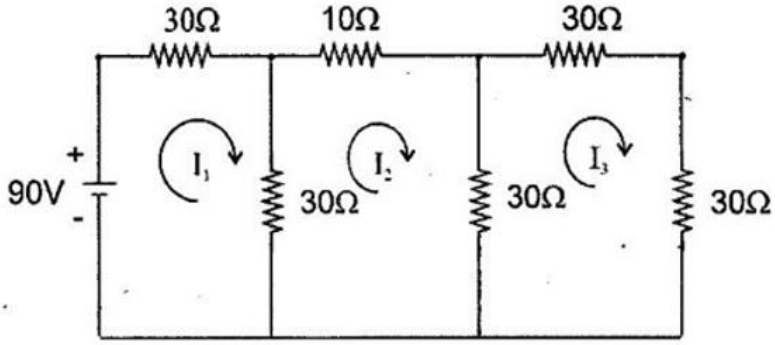
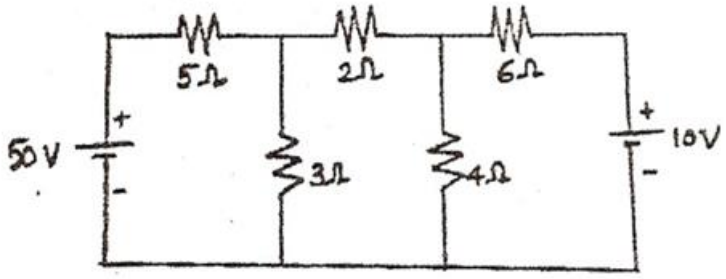
UNIT-I: ELECTRICAL CIRCUITS

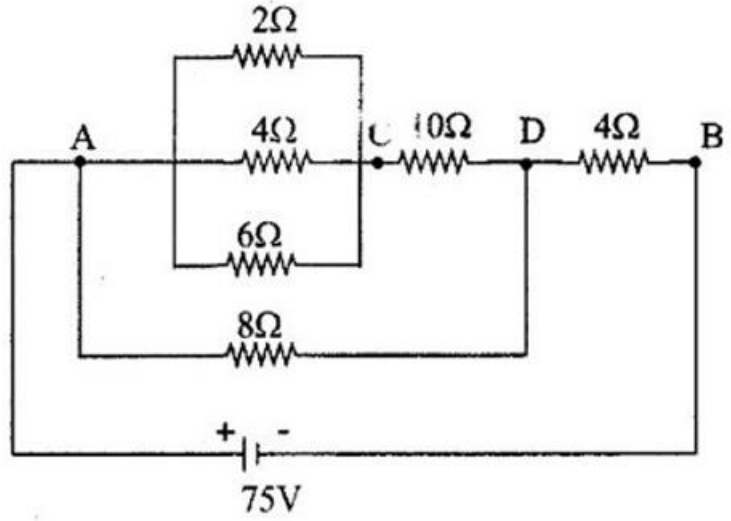
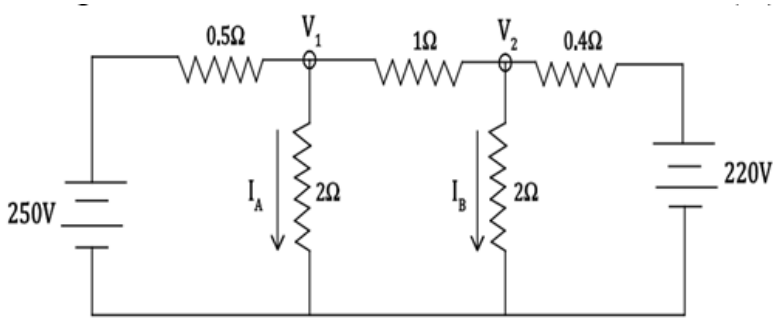
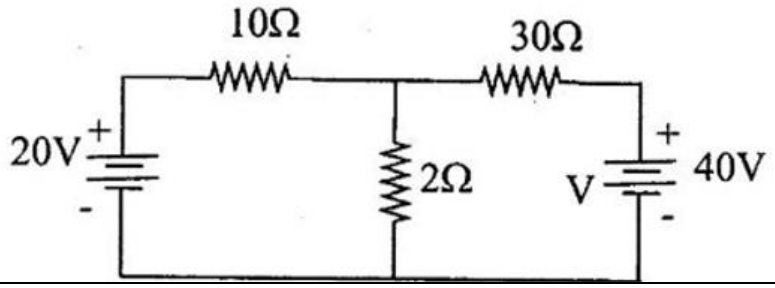
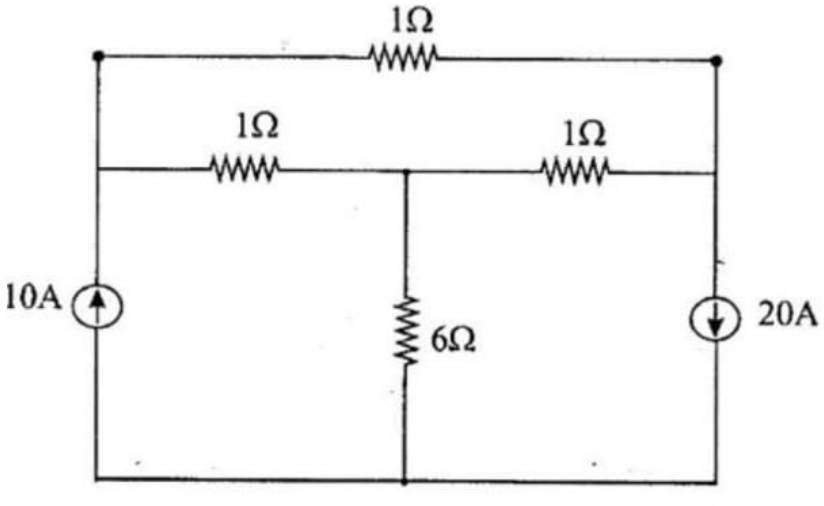
DC Circuits: Circuit Components: Conductor, Resistor, Inductor, Capacitor – Ohm's Law - Kirchhoff's Laws –Independent and Dependent Sources – Simple problems- Nodal Analysis, Mesh analysis with independent sources only (Steady state) Introduction to AC Circuits and Parameters: Waveforms, Average value, RMS Value, Instantaneous power, real power, reactive power and apparent power, power factor – Steady state analysis of RLC circuits (Simple problems only).

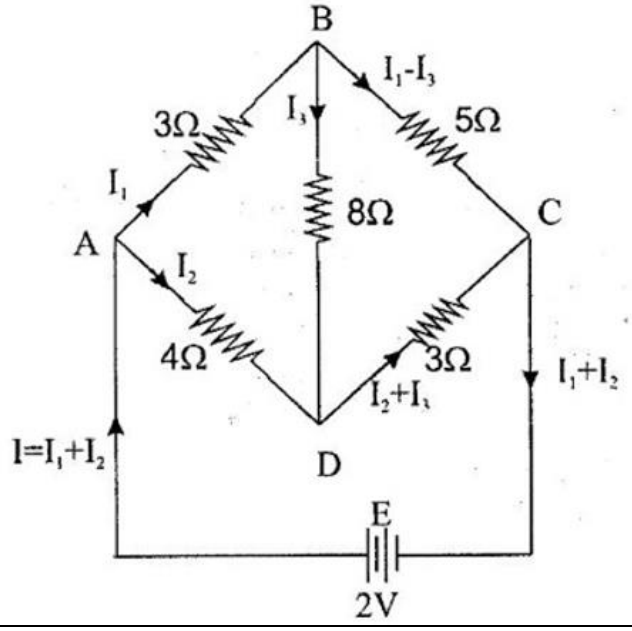
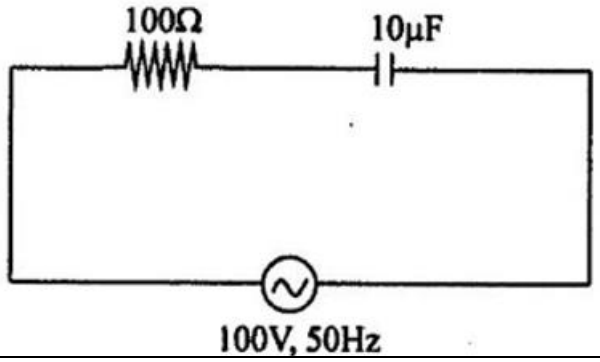
PART – A

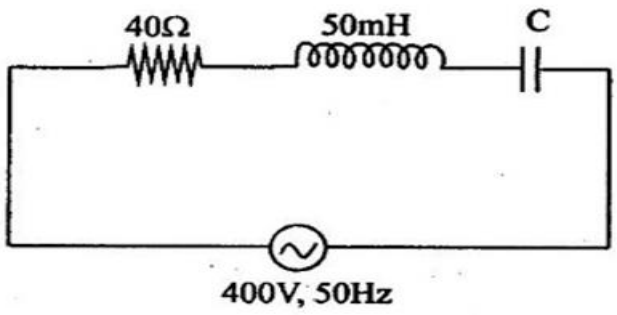
Q.No	Questions	BT Level	Competence	Course Outcome
1.	State Ohm's Law.	BTL 1	Remember	CO1
2.	Define active elements and passive elements.	BTL 3	Apply	CO1
3.	How voltage source with a source resistance can be converted into an equivalent current source?	BTL 4	Analyze	CO1
4.	State real power and reactive power.	BTL 1	Remember	CO1
5.	What is current division rule?	BTL 2	Understand	CO1
6.	Compare series and parallel connections.	BTL 5	Evaluate	CO1
7.	Write down the expression for effective resistance when three resistances are connected in series and parallel.	BTL 2	Understand	CO1
8.	State Kirchhoff's laws.	BTL 2	Understand	CO1
9.	Define the term resistor and capacitor.	BTL 1	Remember	CO1
10.	Two inductances L_1=3mH and L_2=6mH are connected in parallel. Analyze and infer L_{eq} .	BTL 5	Evaluate	CO1
11.	Distinguish between transient response and steady state response of a circuit.	BTL 1	Remember	CO1
12.	Define the term power factor.	BTL 4	Analyze	CO1
13.	Define real power.	BTL 2	Understand	CO1
14.	Define apparent power.	BTL 3	Apply	CO1
15.	Define RMS value.	BTL 4	Analyze	CO1
16.	Sketch out the symbols of resistor, Inductor and capacitor.	BTL 1	Remember	CO1
17.	Calculate the total resistance of the parallel connection of two resistors of 10Ω and 30Ω.	BTL 6	Create	CO1
18.	A Resistor of 50 Ohm has the potential difference of 100 Volts across DC supply for 1 Hour. Examine the value of (i) Power (ii) Energy.	BTL 6	Create	CO1
19.	Draw the symbol for dependent and independent voltage source.	BTL 1	Remember	CO1
20.	Define the following terms (i) Node (ii) Loop.	BTL 3	Apply	CO1
21.	Two capacitance C_1, C_2 of the values 10 µF and 5 µF respectively are connected in series. Evaluate the equivalent capacitance.	BTL 1	Remember	CO1

22.	Two resistances of 4 ohm and 6 ohms are connected in parallel across 10V battery. Determine the current through 6-ohm resistance.	BTL 1	Remember	CO1
23.	Define the term steady state response.	BTL 2	Understand	CO1
24.	Define form factor.	BTL 2	Understand	CO1
	PART – B			
1.	Explain the types of circuit elements in detail. **(16)**	BTL 1	Remember	CO1
2.	i)Three resistors are connected in series with 12 V battery, find the voltage across the three resistors 4Ω, 8Ω and 12Ω of circuit shown in figure. **(6)**  ii)A 60W, 200V lamp is connected in series with 40W, 240V lamp across 250 V supply. Determine (i) current taken (ii) voltage across each lamp and (iii) power given by the lamps. Assume that resistance of the lamps remain constant. **(4+3+3)**	BTL 2	Understand	CO1
3.	Find the current through 5-ohm resistance using mesh current analysis. **(16)** 	BTL 1	Remember	CO1
4.	Find the current through 10-ohm resistance using mesh current analysis. **(16)** 	BTL 5	Evaluate	CO1
5.	Using Kirchhoff's law find the currents through each resistor and voltage drop across each resistor in the given circuit. **(16)**	BTL 6	Create	CO1

				
6.	Use mesh analysis to determine the three mesh currents in the circuit shown below. **(16)** 	BTL 3	Apply	CO1
7.	Find the current I which flows through 10 Ω resistor in the given circuit. **(16)** 	BTL 2	Understand	CO1
8.	Determine the power dissipation in the 4Ω resistor of the given circuit shown in Fig **(16)** 	BTL 1	Remember	CO1
9.	In the figure shown has a combination of resistances. If the voltage across A and B is 75 Volts. Determine (i) The equivalent resistance of the circuit **(08)** (ii)Total current in the circuit **(04)** (iii) Power supplied by battery **(04)**	BTL 2	Understand	CO1

				
10.	Find the values of V_1 and V_2 and I_A and I_B by Nodal analysis method as shown in Fig. **(16)** 	BTL 1	Remember	CO1
11.	Find the current through 2Ω resistor in network by using mesh method. Also find the power supplied by the batteries. **(16)** 	BTL 2	Understand	CO1
12.	Find the current through 6Ω resistor in the circuit by nodal method. **(16)** 	BTL 1	Remember	CO1

13.	Determine the current I_1, I_2 and I_3 of the network shown in figure. **(16)** 	BTL 4	Analyze	CO1
14.	Explain the steady state analysis of series RLC circuit in detail. **(16)**	BTL 4	Apply	CO1
15.	A series circuit has R=10Ω, L=50mH and C=100μF and is supplied and is applied with 200V, 50 Hz. Find and examine the value of: (1) Impedance (2) Current (3) Power (4) Power factor (5) Phase angle (6) Voltage drop across each element. **(16)**	BTL 3	Remember	CO1
16.	A capacitor having a capacitance of 10 μF is connected in series with a non-inductive resistance of 100Ω across a 100V 50 Hz supply. Calculate (a) current (b) Phase difference between the current and supply voltage (c) Power. **(16)** 	BTL 2	Understand	CO1

17.	In an RLC circuit, pure resistance of 40 Ω, pure inductance of 50 mH and a capacitor connected across 400 V, 50Hz ac supply. RLC circuit draws current of 10 A. Determine power factor of circuit and capacitor value**.** **(16)**  	BTL 2	Analyze	CO1

UNIT II - ELECTRICALMACHINES

Construction and Working principle- DC Separately and Self-excited Generators, EMF equation, Types and Applications. Working Principle of DC motors, Torque Equation, Types and Applications. Construction, working principle and Applications of Transformer, three phase Alternator, Synchronous motor and Three Phase Induction Motor.

PART – A

Q.No	Questions	BT Level	Competence	COs
1.	List any two applications of DC Shunt Motor.	BTL 1	Remember	CO2
2.	Explain the principle of DC generator.	BTL 1	Remember	CO2
3.	Distinguish the difference between DC Motor and DC Generator.	BTL 2	Understand	CO2
4.	Explain the principle of DC Motor.	BTL 4	Analyze	CO2
5.	Define the term back EMF or Counter EMF and state its significance.	BTL 1	Remember	CO2
6.	List the different main constructional elements of DC Machine.	BTL 1	Remember	CO2
7.	List the function of Commutator in DC Machines.	BTL 1	Remember	CO2
8.	Write an EMF Equation of DC Generator.	BTL 3	Apply	CO2
9.	Give the Fleming's left-hand rule.	BTL 2	Understand	CO2
10.	List any two applications of DC Cumulative Compound Motor.	BTL 1	Remember	CO2
11.	Discuss the terms with appropriate formula for Faraday's law of Electromagnetic Induction.	BTL 2	Understand	CO2

12.	Mention few applications of DC Generators.	BTL 2	Understand	CO2
13.	Explain the Basic principle of Transformer.	BTL 4	Analyze	CO2
14.	Justify, why transformer core is not a solid piece?	BTL 4	Analyze	CO2
15.	Give the Fleming's right-hand rule.	BTL 6	Create	CO2
16.	Draw the circuit diagram of single-phase transformer.	BTL 3	Apply	CO2
17.	Formulate the expression for step up and step-down transformer according to transformation ratio.	BTL 6	Create	CO2
18.	Compare the following transformers (i) Core type transformer (ii) Shell type.	BTL 5	Evaluate	CO2
19.	Formulate the EMF equation for Transformer.	BTL 3	Apply	CO2
20.	In a single phase transformer, Np= 350 turns, Ns= 1050 turns, Ep= 400V. Calculate the value of secondary voltage (Es).	BTL 5	Evaluate	CO2
21.	Define synchronous speed.	BTL 1	Remember	CO2
22.	List out the Various types of three phase alternator.	BTL 4	Analyze	CO2
23.	List the types of Induction Motors.	BTL 1	Remember	CO2
24.	List out the applications of various types of synchronous Motors.	BTL 1	Remember	CO2
	PART – B			
1.	With a neat sketch, explain the construction, working of DC Motor and explain the different parts. **(16)**	BTL 4	Analyze	CO2
2.	With a neat diagram explain the construction and working of D.C. Generator. **(16)**	BTL 1	Remember	CO2
3.	Draw the circuit model of Different types of DC Generator and give the Generated emf equations in terms of the machine parameters. **(16)**	BTL 5	Evaluate	CO2
4.	Derive the EMF Equation of Generator and explain each term. **(16)**	BTL 4	Analyze	CO2
5.	Define Faradays law of Electromagnetic Induction and explain the working of transformer with neat sketch. **(16)**	BTL 1	Remember	CO2
6.	With neat Circuit model, explain the Various types of D.C. Motors and its terminal voltage equations in terms of the machine parameters. **(16)**	BTL 1	Remember	CO2
7.	Derive the Torque Equation of D.C. Motor. **(16)**	BTL 3	Apply	CO2
8.	What is meant by Transformer? Draw the circuit diagram for Single Phase Transformer and explain the Principle, Construction	BTL 4	Analyze	CO2

	and Working. **(16)**			
9.	Draw the circuit diagram for Three Phase Transformer and its Various Connections. **(16)**	BTL 6	Create	CO2
10.	(i) A six-pole, lap-connected dc generator has a total of 650 conductors. The flux per pole is 0·05 Wb. Calculate the speed at which the armature is to be driven to generate an EMF of 220 Volts. **(8)** (ii) A four-pole dc generator having wave-wound armature winding has 51 slots, each slot containing 20 conductors. Calculate the voltage generated in the armature when driven at 1500 rpm. Assume flux per pole to be 0.5 mWb. **(8)**	BTL 1	Remember	CO2
11.	Distinguish the following types of transformers (i) Step up and Step-down Transformer (ii) Core type and Shell type Transformer. **(8+8)**	BTL 2	Understand	CO2
12.	(i) Derive the expression of EMF induced in Primary and Secondary winding of Transformer. **(8)** (ii) A transformer has 1000 turns on its primary and 500 turns on the secondary. When a voltage, V of frequency f is connected across the primary winding a maximum flux of 2 × 10−3 Wb is produced in the core which links both the windings. Calculate the value of the EMF induced in the two windings. **(8)**	BTL 4 BTL 4	Analyze Analyze	CO2 CO2
13.	Explain the Applications of Various types of DC motor. **(16)**	BTL 2	Understand	CO2
14.	Explain the construction and working of 3 phase synchronous motor. **(16)**	BTL 1	Remember	CO2
15.	Explain the construction and working of an AC Generator. **(16)**	BTL 2	Understand	CO2
16.	Explain the construction and working of 3 phase alternators. **(16)**	BTL 1	Remember	CO2
17.	Explain construction and working of three phase induction motor. **(16)**	BTL 1	Remember	CO2

UNIT III - ANALOG ELECTRONICS

Resistor, Inductor and Capacitor in Electronic Circuits- Semiconductor Materials: Silicon & Germanium – PN Junction Diodes, Zener Diode –Characteristics Applications – Bipolar Junction Transistor-Biasing, JFET, SCR, MOSFET, IGBT – Types, I-V Characteristics and Applications, Rectifier, and Inverters.

PART T – A

Q.No	Questions	BT Level	Competence	CO
1.	What is meant by active and passive components in electronic circuits?	BTL 4	Analyze	CO3

2.	Distinguish the following semiconductors (i) Intrinsic or pure Semiconductor (ii) Extrinsic or impure Semiconductor.	BTL 2	Understand	CO3
3.	What do you mean by biasing?	BTL 2	Understand	CO3
4.	What is doping? Also express the terms (i) Donor (ii) Acceptor.	BTL 1	Remember	CO3
5.	Define Knee voltage or Junction barrier voltage for PN Junction.	BTL 2	Understand	CO3
6.	Draw the circuit for (i) Forward Bias (ii) Reverse Bias of the PN Junction diode.	BTL 3	Apply	CO3
7.	Explain the following terms (i) Avalanche breakdown (ii) Zener breakdown of the PN junction diode.	BTL 4	Analyze	CO3
8.	Compare PN junction diode and Zener diode with symbolic representation.	BTL 4	Analyze	CO3
9.	Draw the V-I characteristics of PN-Junction diode.	BTL 3	Apply	CO3
10.	What is Zener effect?	BTL 1	Remember	CO3
11.	What is Zener diode? List its applications.	BTL 1	Remember	CO3
12.	Draw the symbolic representation of NPN and PNP Transistors.	BTL 3	Apply	CO3
13.	Which configuration is known as emitter follower and why it is named so?	BTL 2	Understand	CO3
14.	What are the different configurations in BJT?	BTL 1	Remember	CO3
15.	Define the terms (i) Saturation region (ii) Cut off region (iii) Break down region of a transistor in CE Configuration.	BTL 2	Understand	CO3
16.	Define Latching current in SCR.	BTL 2	Understand	CO3
17.	Define Holding Current.	BTL 1	Remember	CO3
18.	Why MOSFET and IGBT are called as voltage-controlled devices?	BTL 5	Evaluate	CO3
19.	Sketch the symbols of JFET, IGBT and MOSFET.	BTL 1	Remember	CO3
20.	List out the types of rectifiers.	BTL 1	Remember	CO3
21.	Give the reason for using filters in rectifies.	BTL 4	Analyze	CO3
22.	Define the term Rectifier and give its types.	BTL 1	Remember	CO3
23.	What is inverter and give the types of inverters?	BTL 3	Apply	CO3
24.	Give the applications of inverter.	BTL 3	Apply	CO3
	PART – B			
1.	Explain about intrinsic and extrinsic semiconductors in detail. **(16)**	BTL 3	Apply	CO3
2.	Describe the following VI Characteristics of a PN Junction diode. (i) Forward Bias Characteristics (ii) Reverse Bias Characteristics. Also write its applications. **(16)**	BTL 1	Remember	CO3
3.	Describe the working principle of Zener diode. And explain the terms (i) Zener Breakdown (ii) Avalanche Breakdown. **(16)**	BTL 1	Remember	CO3

4.	Explain the working of PN junction diode and mention its applications. **(16)**	BTL 4	Analyze	CO3
5.	Explain with neat diagram the construction and operation of BJT. **(16)**	BTL 2	Understand	CO3
6.	Explain the working of CB Configuration of NPN transistor. Also obtain the input output characteristics. **(16)**	BTL 4	Analyze	CO3
7.	Explain the working of CC Configuration of NPN transistor. Also obtain the input output characteristics. **(16)**	BTL 4	Analyze	CO3
8.	For the CE transistor configuration, draw the circuit and explain the input and output characteristics. **(16)**	BTL 4	Analyze	CO3
9.	Explain the construction and working of SCR. **(16)**	BTL 2	Understand	CO3
10.	Explain with neat diagram the construction and operation of a JFET. **(16)**	BTL 2	Understand	CO3
11.	Explain V-I characteristics of SCR and applications with necessary diagram. **(16)**	BTL 2	Understand	CO3
12.	Explain the working of N Channel MOSFET with neat diagrams. **(16)**	BTL 1	Remember	CO3
13.	Explain the working principle full wave rectifier with neat waveform. **(16)**	BTL 1	Remember	CO3
14.	Compare and tabulate the different parameters in half and full wave rectifiers. **(16)**	BTL 4	Analyze	CO3
15.	With a neat diagram explain the principle of operation, working of half wave rectifier. **(16)**	BTL 1	Remember	CO3
16.	Explain the term Bridge rectifier with suitable circuit diagram and formulate its efficiency, ripple factor, TUF and PIV. **(16)**	BTL 3	Apply	CO3
17.	Explain the working single-phase inverter with relevant waveforms. **(16)**	BTL 1	Remember	CO3

UNIT IV - DIGITAL ELECTRONICS				
Review of number systems, binary codes, error detection and correction codes, Combinational logic - representation of logic functions-SOP and POS forms, K-map representations – minimization using K maps (Simple Problems only)				
PART –A				
Q.No.	Questions	BT Level	Competence	CO
1.	Label the different types of number system.	BTL1	Remember	CO4
2.	Convert decimal to binary. i. 35 ii. 25	BTL2	Understand	CO4
3.	Build the rules for binary to octal conversion with an example.	BTL3	Apply	CO4
4.	Bring out the rules for binary to hexadecimal conversion with an example.	BTL1	Remember	CO4
5.	Deduct the rules for octal to hexadecimal conversion with an example.	BTL5	Evaluate	CO4

6.	Illustrate binary codes.	BTL2	Understand	CO4
7.	Explore the different types of binary codes.	BTL4	Analyze	CO4
8.	Define gray code.	BTL1	Remember	CO4
9.	Switch the gray code 1101 to binary code.	BTL4	Analyze	CO4
10.	Identify error detection and correction code.	BTL3	Apply	CO4
11.	Recall about Boolean algebra.	BTL1	Remember	CO4
12.	What do you meant by postulates?	BTL1	Remember	CO4
13.	Compose the meaning of literals.	BTL6	Creating	CO4
14.	Compile about product term and sum term.	BTL6	Creating	CO4
15.	Convert binary to gray code 1001.	BTL4	Analyze	CO4
16.	Outline Excess-3 code.	BTL2	Understand	CO4
17.	Criticize SOP form & POS form.	BTL5	Evaluate	CO4
18.	Recollect canonical form.	BTL1	Remember	CO4
19.	Infer about octet, quad, pair and isolated ones.	BTL2	Understand	CO4
20.	f(A,B,C)=ABC+AB'C+ABC'+A'BC express in M-notation.	BTL3	Apply	CO4
21.	Analyze the limitations while using Boolean postulates and theorems for simplifying Boolean function.	BTL4	Analyze	CO4
22.	Renovate decimal to octal. i. 45 ii. 65	BTL1	Remember	CO4
23.	Infer the rules of successive multiplication method.	BTL2	Understand	CO4
24.	Determine the following i. $(110011)_2$ = (_____)$_{10}$ ii. $(43)_8$ = (_____)$_{10}$	BTL3	Apply	CO4
	PART – B			
1.	Convert the following numbers to their decimal equivalents $(BC2)_{16}$ and $(11011.011)_2$. **(16)**	BTL 3	Apply	CO4
2.	Simply using K-map F = π M (1,1,3,6,8,9,11,15). (16)	BTL 4	Analyze	CO4
3.	Simply the Expression Y= ∑ m(3,4,6,7,8,9,10,13,14,15). (16)	BTL 4	Analyze	CO4
4.	Draw the symbol and truth table of logic gates. (16)	BTL 4	Analyze	CO4
5.	Briefly explain the binary , decimal , Octal and Hexadecimal number systems. (16)	BTL 3	Apply	CO4
6.	Reduce the following function using K-map technique for F(A,B,C,D)= π M (0,2,3,8,9,12,13,15) (16)	BTL 3	Apply	CO4
7.	What is Half Adder ? Draw the schematic circuit of half adder with Boolean functions. (16)	BTL 4	Analyze	CO4
8.	Discuss in detail about Number system. (16)	BTL 3	Apply	CO4
9.	Simply using K-map. F(A,B,C,D)= ∑ m(7,8,9) + d(10,11,12,13,14,15). (16)	BTL 4	Analyze	CO4
10.	What is Half Subtractor? Draw the schematic circuit of half subtractor with Boolean functions. (16)	BTL 3	Apply	CO4
11.	(i) Convert the hexadecimal number $(28D)_{16}$ to its decimal,	BTL 3	Apply	CO4

	binary and octal equivalent. (8) (ii) Convert $(FACE)_{16}$ into its binary, octal and decimal equivalent. (8)			
12.	Explain Hamming code with an example. State its advantages over parity codes. (16)	BTL 4	Analyze	CO4
13.	Explain in detail about the classification of binary codes. (16)	BTL 4	Analyze	CO4
14.	Determine which bit, if any, is in error in the even parity, Hamming coded information $(1100111)_2$. Decode the correct message. (16)	BTL 4	Analyze	CO4
15.	Using K map method obtain the minimal SOP & POS expression for the function. $F(W, X,Y,Z) = \sum m(1,3,4,5,6,7,9,12,13)$ (16)	BTL 3	Apply	CO4
16.	Express the following function in a simplified manner using K Map technique $f(W,X,Y,Z)=\Sigma m(0,7,8,9,10,12) + \Sigma d(2,5,13)$. (16)	BTL 3	Apply	CO4
17.	Assume that the even parity Hamming code in example (0 1 1 0 0 1 1) is transmitted and that 0100011 is received. The receiver does not know what was transmitted. Determine bit location where error has occurred using received code. (16)	BTL 4	Analyze	CO4

UNIT V - MEASUREMENT AND INSTRUMENTATION

Functional elements of an instrument, Standards and calibration, Operating Principle, types Moving Coil and Moving Iron meters, Measurement of three phase power, Energy Meter, Instrument Transformers-CT and PT, DSO- Block diagram- Data acquisition

PART – A

Q.No	Questions	BT Level	Competence	CO
1.	What is meant by instrument?	BTL 1	Remember	CO5
2.	Classify instruments based on their functions.	BTL 2	Understand	CO5
3.	What is a standard? What are the different types of Standard?	BTL 1	Remember	CO5
4.	Mention the uses of instrument transformer.	BTL 1	Remember	CO5
5.	Compare moving coil and moving iron instruments based on any two salient features.	BTL 2	Understand	CO5
6.	Mention the two types of MI instrument.	BTL 1	Remember	CO5
7.	Name the torques that acts in indicating instrument.	BTL 1	Remember	CO5
8.	What are the sources of errors that may occur in permanent magnet moving coil instrument?	BTL 1	Remember	CO5
9.	Explain the operating principle of moving iron (MI) instrument.	BTL 2	Understand	CO5
10.	Which type of instruments is called universal instrument?	BTL 2	Understand	CO5
11.	What are the errors occurring in MI instrument.	BTL 3	Apply	CO5
12.	Write and explain the torque equation of moving coil.	BTL 1	Remember	CO5
13.	What are the operating forces needed for indicating instrument?	BTL 1	Remember	CO5
14.	What are the measurements of three phase power?	BTL 1	Remember	CO5
15.	What are the applications of MI instrument?	BTL 1	Remember	CO5
16.	Mention the importance of moving coil instruments	BTL 2	Understand	CO5
17.	Why we need damping device in indicating instruments?	BTL 2	Understand	CO5

18.	What is instrument transformer? Give its types.	BTL 1	Remember	CO5
19.	Define Current Transformer and Potential Transformer?	BTL 2	Understand	CO5
20.	How the CT and PT are connected in the circuits	BTL 2	Understand	CO5
21.	What are the constructional parts of current transformer?	BTL 2	Understand	CO5
22.	What are the advantages and disadvantages of Instrument transformer?	BTL 2	Understand	CO5
23.	What is data acquisition system (DAS)?	BTL 1	Remember	CO5
24.	Mention some applications of DAS.	BTL 1	Remember	CO5
	PART B			
1.	Draw the block diagram of the basic functional elements of an instrument and explain the functions of each. (16)	BTL 4	Analyze	CO5
2.	Discuss the different types of standards of measurements. (16)	BTL 4	Analyze	CO5
3.	Explain in detail about the types of MI instruments with construction. (16)	BTL 3	Apply	CO5
4.	Explain the working principle of Permanent magnet Moving coil (PMMC) measuring instrument with neat construction and also derive the torque developed in this instrument. (16)	BTL 3	Apply	CO5
5.	With a neat diagram, explain the operation of Digital storage oscilloscope (DSO). (16)	BTL 4	Analyze	CO5
6.	Briefly explain the different types of calibration. (16)	BTL 4	Analyze	CO5
7.	Explain in detail about induction type Energy meter. (16)	BTL 3	Apply	CO5
8.	Explain with neat sketch the classification of instrument transformer. Write a note on the errors affecting the characteristics of an instrument. (16)	BTL 4	Analyze	CO5
9.	Discuss the constructional of P.T and explain about the error in potential transformer. (16)	BTL 4	Analyze	CO5
10.	Derive the torque equation of PMMC and MI instruments. (16)	BTL 4	Analyze	CO5
11.	Explain the measurement of three phase power using two wattmeter method. (16)	BTL 3	Apply	CO5
12.	Write notes on types of three phase power measurement. (16)	BTL 3	Apply	CO5
13.	Draw and explain in detail about data acquisition system (DAS). (16)			
14.	Write short notes on two and three element Energy meter. (16)	BTL 3	Apply	CO5
15.	With a neat diagram, explain the construction and working principle of electrodynamometer type wattmeter. Also derive its torque equation. (16)	BTL 3	Apply	CO5
16.	With a neat diagram explain the construction and working principle of 1f wattmeter. What is the importance of deflection torque in these instruments? (16)	BTL 4	Analyze	CO5
17.	Explain the construction and working principle of single-phase induction type energy meter. Write short notes on any 2 adjustments required in energy meter. (16)	BTL 4	Analyze	CO5