CENTRAL POLYTECHNIC COLLEGE, THARAMANI-600 113.

(An Autonomous Institution)

DEPARTMENT OF

BASIC ENGINEERING

QUESTION BANK

EBE21023 – BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

EBE21023 – BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

Unit I FUNDAMENTALS OF ELECTRICAL ENGINEERING

Introduction to Electricity: Uses of Electricity in Engineering & Health care - Duties & responsibilities of Electrical Engineer Important Terms: Electrical materials -Electrical quantities- [Charge, Current, Potential difference, DC & AC supply – Types & Difference, Power & Energy] Basic Laws: Coulomb‘s law-Lenz Law-Fleming‘s rule. Electric Components & Circuits: Voltage, Current, Power & Energy simply calculation using Series & Parallel connection of Resistors, Inductors & Capacitors using Ohm‘s law only.

Unit II ELECTRICAL SYSTEMS

Power Generation: Energy sources –Power stations - Block Diagram of AC transmission – Functions of TANGEDCO Conversion of Energy: Motor, Generator and Transformer – main parts, types (names only) and uses. Different types of lamps – Simple lamp circuit-Applications of Solar PV panels– Concept of Electric Vehicles-Types–Domestic house wiring

Unit III PASSIVE COMPONENTS

Types of Electronic Components - Resistor, Capacitor and inductor- Symbol, Working Principle, Properties, Types and Uses-Colour Coding ofResistor –Self and Mutual Inductance

Unit IV FUNDAMENTALS OF SEMICONDUCTORS

Semiconductors: Energy Band, Fermi level, Intrinsic and Extrinsic Semiconductors, P-Type and N-Type Semiconductors, Drift Current, Diffusion Current. PN Junction Diode and Zener Diode: Symbol, construction and working-Forward Bias, Reverse Bias, VI Characteristics, Applications.

Unit V ELECTRICALSAFETY,PCB AND SOLDERING

Electrical Safety: Hazards of electricity [shock, burns, arc-blast, Thermal Radiation, explosions, fires, effects of electricity on the human body] –Safety precautions - First Aid for Electrical Accidents -Protective devices– Earthing – lightning arrester Introduction to PCB - Types, PCB Materials, Steps involved in preparation of a PCB. Introduction to Soldering - Types of Solder, Soldering Tools, Soldering Safety precautions.

UNIT	Q NO	QUESTIONS
1	1	Which law states that the electrostatic force between two charges is directly proportional to the product of the charges? (a) Coulomb's law (b) Ohm's law (c) Lenz's law (d) Fleming's rule **Ans:Coulomb's law**
1	2	The unit of electric charge is: (a) Coulomb (b) Volt (c) Ampere (d) Ohm **Ans:Coulomb**
1	3	Which of the following is used to measure electric current? (a) Ammeter (b) Voltmeter (c) Wattmeter (d) Ohmmeter **Ans:Ammeter**
1	4	In AC supply, the current direction: (a) Changes periodically (b) Remains constant (c) Reverses once (d) Is random **Ans:Changes periodically**
1	5	Which is an example of a conductor? (a) Copper (b) Rubber (c) Glass (d) Plastic **Ans:Copper**
1	6	The SI unit of potential difference is: (a) Volt (b) Ohm (c) Ampere (d) Watt **Ans:Volt**
1	7	Ohm's law relates: (a) Voltage, Current, Resistance (b) Power, Energy, Time (c) Charge, Force, Distance (d) Current, Frequency, Wavelength **Ans:Voltage, Current, Resistance**
1	8	Which connection type has the same current through all components? (a) Series (b) Parallel (c) Mixed (d) Open **Ans:Series**
1	9	Which device converts electrical energy into mechanical energy? (a) Motor (b) Generator (c) Transformer (d) Battery **Ans:Motor**
1	10	The time rate of flow of electric charge is called: (a) Current (b) Voltage (c) Power (d) Resistance **Ans:Current**

UNIT	Q NO	QUESTIONS
1	11	Which law determines the direction of induced current? (a) Lenz's law (b) Coulomb's law (c) Ohm's law (d) Kirchhoff's law **Ans:Lenz's law**
1	12	In healthcare, electricity is NOT used for: (a) MRI machines (b) X-ray (c) Ultrasound (d) Plant irrigation **Ans:Plant irrigation**
1	13	In DC supply, current flows: (a) In one direction (b) Alternates direction (c) Randomly (d) Varies sinusoidally **Ans:In one direction**
1	14	Which instrument measures potential difference? (a) Voltmeter (b) Ammeter (c) Wattmeter (d) Ohmmeter **Ans:Voltmeter**
1	15	A resistor of 10Ω and another of 20Ω in series have total resistance: (a) 30Ω (b) 10Ω (c) 20Ω (d) 15Ω **Ans:30Ω**
1	16	A inductor stores energy in the form of: (a) Electric field (b) Magnetic field (c) Heat (d) Chemical energy **Ans:Magnetic field**
1	17	Fleming's Right Hand Rule is used for: (a) Generators (b) Motors (c) Transformers (d) Batteries **Ans:Generators**
1	18	Which of these is an insulator? (a) Rubber (b) Aluminium (c) Copper (d) Iron **Ans:Rubber**
1	19	Which formula calculates power? (a) $P = VI$ (b) $P = IR$ (c) $P = V/R$ (d) $P = I^2R$ **Ans:P = VI**
1	20	The charge on one electron is approximately: (a) 1.6×10^{-19} C (b) 1.6×10^{19} C (c) 1.6×10^{-18} C (d) 1.6×10^{18} C **Ans:1.6×10^{-19} C**

UNIT	Q NO	QUESTIONS
1	21	Which connection type has the same voltage across all components? (a) Parallel (b) Series (c) Mixed (d) Short circuit **Ans:Parallel**
1	22	Which electrical material has the highest conductivity? (a) Silver (b) Aluminium (c) Copper (d) Iron **Ans:Silver**
1	23	Lenz's law is related to: (a) Electromagnetic induction (b) Electrostatics (c) Ohmic heating (d) Current division **Ans:Electromagnetic induction**
1	24	Fleming's Left Hand Rule is used for: (a) Motors (b) Generators (c) Transformers (d) Capacitors **Ans:Motors**
1	25	The product of voltage and current gives: (a) Power (b) Resistance (c) Energy (d) Charge **Ans:Power**
1	26	The energy consumed by a 1000 W appliance in 2 hours is: (a) 2 kWh (b) 0.5 kWh (c) 1 kWh (d) 4 kWh **Ans:2 kWh**
1	27	The reciprocal of resistance is called: (a) Conductance (b) Impedance (c) Reactance (d) Capacitance **Ans:Conductance**
1	28	Which type of supply is used in household wiring in India? (a) AC (b) DC (c) Mixed (d) Variable DC **Ans:AC**
1	29	A voltmeter is connected in: (a) Parallel (b) Series (c) Either way (d) None **Ans:Parallel**
1	30	A 12 V battery supplies 3 A to a circuit. The resistance is: (a) 4 Ω (b) 36 Ω (c) 0.25 Ω (d) 15 Ω **Ans:4 Ω**

UNIT	Q NO	QUESTIONS	
1	31	A parallel connection of resistors results in: (a) Lower total resistance (c) Same resistance **Ans:Lower total resistance**	(b) Higher total resistance (d) Infinite resistance
1	32	Which of these quantities is scalar? (a) Electric charge (c) Magnetic flux **Ans:Electric charge**	(b) Electric field (d) Current density
1	33	Which of these is a renewable source of energy? (a) Solar (c) Oil **Ans:Solar**	(b) Coal (d) Natural Gas
1	34	What is the frequency of AC supply in India? (a) 50 Hz (c) 40 Hz **Ans:50 Hz**	(b) 60 Hz (d) 55 Hz
1	35	The unit of electric power is: (a) Watt (c) Ohm **Ans:Watt**	(b) Volt (d) Ampere
1	36	Which safety device cuts off current in case of overload? (a) Fuse (c) Inductor **Ans:Fuse**	(b) Resistor (d) Capacitor
1	37	The main duty of an electrical engineer in a hospital is: (a) Maintain medical equipment (c) Prepare food **Ans:Maintain medical equipment**	(b) Grow plants (d) None of these
1	38	Which particle moves in a conductor to form current? (a) Electrons (c) Neutrons **Ans:Electrons**	(b) Protons (d) Ions
1	39	The SI unit of energy is: (a) Joule (c) Volt **Ans:Joule**	(b) Watt (d) Ohm
1	40	Which device stores charge? (a) Capacitor (c) Inductor **Ans:Capacitor**	(b) Resistor (d) Fuse

UNIT	Q NO	QUESTIONS
1	41	The direction of conventional current is: (a) Positive to negative (b) Negative to positive (c) Random (d) Alternating **Ans:Positive to negative**
1	42	An inductor stores energy in the form of: (a) Magnetic field (b) Electric field (c) Heat (d) Light **Ans:Magnetic field**
1	43	Which law gives the relationship between current and voltage for a conductor? (a) Ohm's law (b) Coulomb's law (c) Lenz's law (d) Fleming's rule **Ans:Ohm's law**
1	44	Which is an example of a dielectric material? (a) Mica (b) Copper (c) Aluminium (d) Iron **Ans:Mica**
1	45	The work done in moving a unit charge between two points is: (a) Potential difference (b) Current (c) Power (d) Energy **Ans:Potential difference**
1	46	The sum of potential differences around a closed loop is zero — this is: (a) Kirchhoff's Voltage Law (b) Ohm's law (c) Lenz's law (d) Fleming's rule **Ans:Kirchhoff's Voltage Law**
1	47	Which of these is a unit of conductance? (a) Siemens (b) Ohm (c) Farad (d) Henry **Ans:Siemens**
1	48	Which of these is NOT a component of Ohm's law? (a) Energy (b) Voltage (c) Current (d) Resistance **Ans:Energy**
1	49	Which component opposes change in current? (a) Inductor (b) Resistor (c) Capacitor (d) Fuse **Ans:Inductor**
1	50	What is the symbol for alternating current? (a) ~ (b) - (c) + (d) / **Ans:~**

UNIT	Q NO	QUESTIONS
1	51	Which law relates electrostatic force to charges and inverse square of distance? (a) Ohm's law (b) Coulomb's law (c) Lenz's law (d) Fleming's rule **Ans:Coulomb's law**
1	52	Which electrical quantity is measured in Amperes? (a) Voltage (b) Current (c) Resistance (d) Power **Ans:Current**
1	53	Which supply type changes direction periodically? (a) DC (b) AC (c) Static (d) Impulse **Ans:AC**
1	54	In a DC circuit, current direction is: (a) Changing periodically (b) Constant (c) Random (d) Alternating once **Ans:Constant**
1	55	Lenz's law is associated with: (a) Electric current (b) Magnetic flux (c) Electrostatic force (d) Capacitance **Ans:Magnetic flux**
1	56	Fleming's left-hand rule is used to find: (a) Direction of current (b) Direction of force (c) Magnitude of voltage (d) Resistance **Ans:Direction of force**
1	57	Which component stores energy in an electric field? (a) Resistor (b) Inductor (c) Capacitor (d) Transformer **Ans:Capacitor**
1	58	Total resistance in series connection is: (a) Less than smallest (b) Sum of both (c) Product of both (d) Average of both **Ans:Sum of both**
1	59	Total resistance in parallel connection is: (a) Less than smallest (b) Sum of both (c) Product of both (d) Average of both **Ans:Less than smallest**
1	60	Voltage across each branch in parallel is: (a) Same (b) Different (c) Zero (d) Proportional to current **Ans:Same**

UNIT	Q NO	QUESTIONS	
1	61	Law defining V=IR is: (a) Ohm's law (c) Coulomb's law **Ans:Ohm's law**	(b) Kirchhoff's law (d) Lenz's law
1	62	Unit for electric charge is: (a) Volt (c) Ampere **Ans:Coulomb**	(b) Coulomb (d) Ohm
1	63	Electrical energy consumed is: (a) Voltage × Resistance (c) Current × Resistance **Ans:Power × Time**	(b) Power × Time (d) Power × Voltage
1	64	Inductors in series have total inductance: (a) Sum of individual (c) Product **Ans:Sum of individual**	(b) Less than smallest (d) Average
1	65	Current type that changes magnitude & direction: (a) DC (c) Static **Ans:AC**	(b) AC (d) Impulse
1	66	If resistance increases, current will: (a) Increase (c) Stay same **Ans:Decrease**	(b) Decrease (d) Become infinite
1	67	Coulomb's law applies to: (a) Moving charges (c) Both moving & stationary **Ans:Stationary charges**	(b) Stationary charges (d) Magnetic poles only
1	68	Which is an insulator? (a) Aluminium (c) Rubber **Ans:Rubber**	(b) Silver (d) Gold
1	69	Current is rate of flow of: (a) Electrons (c) Voltage **Ans:Charge**	(b) Charge (d) Energy
1	70	Connection that increases capacitance: (a) Series (c) None **Ans:Parallel**	(b) Parallel (d) Both

UNIT	Q NO	QUESTIONS
2	71	Connection that increases inductance: (a) Series (b) Parallel (c) None (d) Both **Ans:Series**
2	72	The primary function of a power station is to: (a) Store electricity (b) Generate electricity (c) Transmit electricity (d) Consume electricity **Ans:Generate electricity**
2	73	In a block diagram of AC transmission, which component steps up the voltage for transmission? (a) Step-down transformer (b) Step-up transformer (c) Generator (d) Motor **Ans:Step-up transformer**
2	74	TANGEDCO is responsible for: (a) Railway transport (b) Electricity generation and distribution in Tamil Nadu (c) Oil exploration (d) Irrigation projects **Ans:Electricity generation and distribution in Tamil Nadu**
2	75	Which of the following is NOT a conventional energy source? (a) Coal (b) Wind (c) Oil (d) Natural Gas **Ans:Wind**
2	76	Electricity billing for domestic usage is generally calculated in: (a) Joules (b) Watts (c) Kilowatt-hours (d) Volts **Ans:Kilowatt-hours**
2	77	In a generator, mechanical energy is converted into: (a) Heat energy (b) Electrical energy (c) Chemical energy (d) Nuclear energy **Ans:Electrical energy**
2	78	Which device converts electrical energy to mechanical energy? (a) Transformer (b) Motor (c) Generator (d) Inverter **Ans:Motor**
2	79	The core of a transformer is usually made of: (a) Aluminum (b) Copper (c) Soft iron (d) Steel **Ans:Soft iron**
2	80	Which of the following lamps is most energy-efficient? (a) Incandescent lamp (b) CFL (c) LED (d) Halogen **Ans:LED**

UNIT	Q NO	QUESTIONS
2	81	In a simple lamp circuit, the lamp is connected to the supply through: (a) Motor (b) Switch (c) Transformer (d) Fuse only **Ans:Switch**
2	82	A major application of solar panels is: (a) Storing water (b) Generating electricity from sunlight (c) Generating heat from coal (d) Driving diesel engines **Ans:Generating electricity from sunlight**
2	83	Electric vehicles are powered primarily by: (a) Petrol (b) Diesel (c) Batteries (d) Natural gas **Ans:Batteries**
2	84	Which type of wiring is common in domestic houses? (a) Series wiring (b) Ring main wiring (c) Parallel wiring (d) Star wiring **Ans:Parallel wiring**
2	85	In electricity billing, the term “sanctioned load” refers to: (a) Maximum load allowed (b) Minimum load used (c) Average load (d) Unused load **Ans:Maximum load allowed**
2	86	Which of the following is NOT a part of a transformer? (a) Primary winding (b) Secondary winding (c) Rotor (d) Core **Ans:Rotor**
2	87	Hydroelectric power plants convert: (a) Water pressure into electrical energy (b) Heat energy into electrical energy (c) Chemical energy into heat (d) Nuclear energy into heat **Ans:Water pressure into electrical energy**
2	88	The main advantage of AC transmission over DC is: (a) Lower voltage drop (b) Higher voltage drop (c) Higher transmission loss (d) More expensive **Ans:Lower voltage drop**
2	89	Which of the following is a type of electric vehicle? (a) Diesel truck (b) Plug-in hybrid (c) Petrol scooter (d) Steam car **Ans:Plug-in hybrid**
2	90	The function of a fuse in domestic wiring is to: (a) Prevent current flow (b) Allow overcurrent (c) Protect the circuit from overcurrent (d) Store energy **Ans:Protect the circuit from overcurrent**

UNIT	Q NO	QUESTIONS
2	91	Which component is used to measure the energy consumed in a household? (a) Ammeter (b) Energy meter (c) Voltmeter (d) Wattmeter **Ans:Energy meter**
2	92	The main purpose of step-down transformers in distribution is to: (a) Increase voltage (b) Decrease voltage (c) Store energy (d) Convert AC to DC **Ans:Decrease voltage**
2	93	Which of the following is NOT a part of an AC transmission line? (a) Conductor (b) Transformer (c) Insulator (d) Battery **Ans:Battery**
2	94	In thermal power stations, the prime mover is usually a: (a) Gas turbine (b) Steam turbine (c) Hydraulic turbine (d) Wind turbine **Ans:Steam turbine**
2	95	The frequency of AC supply in India is: (a) 50 Hz (b) 60 Hz (c) 40 Hz (d) 25 Hz **Ans:50 Hz**
2	96	Which type of motor is commonly used in domestic fans? (a) DC motor (b) Induction motor (c) Stepper motor (d) Synchronous motor **Ans:Induction motor**
2	97	The main function of the rotor in an electric motor is to: (a) Remain stationary (b) Convert electrical energy to mechanical rotation (c) Increase voltage (d) Generate electricity **Ans:Convert electrical energy to mechanical rotation**
2	98	Which type of power plant uses uranium as fuel? (a) Thermal (b) Nuclear (c) Hydroelectric (d) Solar **Ans:Nuclear**
2	99	CFL lamps work on the principle of: (a) Incandescence (b) Gas discharge (c) Electromagnetism (d) Nuclear reaction **Ans:Gas discharge**
2	100	Which is the most common type of generator used in power stations? (a) DC generator (b) Synchronous generator (c) Induction generator (d) Stepper generator **Ans:Synchronous generator**

UNIT	Q NO	QUESTIONS
2	101	The initial cost of solar power plants is generally: (a) Low (b) High (c) Same as coal plants (d) Negligible **Ans:High**
2	102	Which part of an electric vehicle stores electrical energy? (a) Engine (b) Battery pack (c) Alternator (d) Carburetor **Ans:Battery pack**
2	103	The billing unit for electricity is based on: (a) Voltage × Current (b) Voltage × Time (c) kWh (d) kW × Voltage **Ans:kWh**
2	104	Street lighting often uses: (a) Series connection (b) Parallel connection (c) Star connection (d) Delta connection **Ans:Parallel connection**
2	105	The device that converts AC to DC is called: (a) Transformer (b) Rectifier (c) Inverter (d) Converter **Ans:Rectifier**
2	106	Which type of transformer is used in power stations to connect to transmission lines? (a) Step-down (b) Step-up (c) Isolation (d) Auto-transformer **Ans:Step-up**
2	107	Which lamp produces light due to heating of a filament? (a) LED (b) CFL (c) Incandescent (d) Fluorescent **Ans:Incandescent**
2	108	The main advantage of LED lamps is: (a) Low efficiency (b) Short life (c) Energy efficiency (d) High heat output **Ans:Energy efficiency**
2	109	In AC transmission, high voltage is preferred because it: (a) Reduces current and losses (b) Increases current and losses (c) Increases resistance (d) Reduces power factor **Ans:Reduces current and losses**
2	110	In a hydroelectric power plant, potential energy is stored in: (a) Turbine blades (b) Dam water (c) Generator (d) Transformer **Ans:Dam water**

UNIT	Q NO	QUESTIONS
2	111	Which type of current do synchronous generators produce in power plants? (a) AC (b) DC (c) Pulsating DC (d) Mixed current **Ans:AC**
2	112	Which factor determines the speed of an AC motor? (a) Voltage only (b) Frequency only (c) Frequency and number of poles (d) Current only **Ans:Frequency and number of poles**
2	113	A wind turbine converts: (a) Electrical energy to kinetic energy (b) Kinetic energy to electrical energy (c) Thermal energy to electrical energy (d) Solar energy to electrical energy **Ans:Kinetic energy to electrical energy**
2	114	The main function of an alternator is to: (a) Store energy (b) Generate AC (c) Generate DC (d) Convert AC to DC **Ans:Generate AC**
2	115	Which type of lamp is most efficient in converting electrical energy to light? (a) Incandescent (b) Fluorescent (c) LED (d) Halogen **Ans:LED**
2	116	The main purpose of insulators in transmission lines is to: (a) Conduct current (b) Prevent leakage of current to ground (c) Increase current (d) Reduce frequency **Ans:Prevent leakage of current to ground**
2	117	Which renewable source is directly used in solar thermal plants? (a) Light (b) Heat from sunlight (c) Kinetic energy (d) Nuclear fusion **Ans:Heat from sunlight**
2	118	Which domestic appliance uses a heating element to convert electricity to heat? (a) Refrigerator (b) Electric iron (c) Mixer grinder (d) Ceiling fan **Ans:Electric iron**
2	119	Electric vehicles eliminate: (a) Engine oil usage (b) Electrical losses (c) Battery charging (d) Energy conversion **Ans:Engine oil usage**
2	120	A step-up transformer increases: (a) Current (b) Voltage (c) Resistance (d) Power factor **Ans:Voltage**

UNIT	Q NO	QUESTIONS	
2	121	Which energy source is renewable?	
		(a) Coal	(b) Petroleum
		(c) Solar	(d) Natural gas
		Ans:Solar	
2	122	Which power station uses water to generate electricity?	
		(a) Thermal	(b) Hydro
		(c) Nuclear	(d) Solar
		Ans:Hydro	
2	123	In AC transmission, which device steps up voltage?	
		(a) Transformer	(b) Generator
		(c) Motor	(d) Rectifier
		Ans:Transformer	
2	124	Which power source in seasional	
		(a) Hydro Electric	(b) Wind
		(c) Coal	(d) Both a & b
		Ans:Both a & b	
2	125	College electricity bills are generally under:	
		(a) Domestic tariff	(b) Commercial tariff
		(c) Industrial tariff	(d) Agricultural tariff
		Ans:Commercial tariff	
2	126	Which device converts mechanical energy to electrical?	
		(a) Motor	(b) Generator
		(c) Transformer	(d) Rectifier
		Ans:Generator	
2	127	Which transformer part changes voltage levels?	
		(a) Core	(b) Windings
		(c) Tank	(d) Cooling system
		Ans:Windings	
2	128	Which lamp is most energy-efficient?	
		(a) Incandescent	(b) CFL
		(c) LED	(d) Fluorescent tube
		Ans:LED	
2	129	A simple lamp circuit contains:	
		(a) Lamp, switch, supply	(b) Lamp, transformer, motor
		(c) Lamp, generator, battery	(d) Lamp, capacitor, inductor
		Ans:Lamp, switch, supply	
2	130	Solar panels are mainly used for:	
		(a) Heating only	(b) Lighting
		(c) Cooling only	(d) Lubrication
		Ans:Lighting	

UNIT	Q NO	QUESTIONS	
2	131	Energy in electric vehicles is stored in: (a) Capacitors (c) Transformers **Ans:Batteries**	(b) Batteries (d) Flywheels
2	132	Domestic house wiring is generally: (a) Series (c) Mixed **Ans:Parallel**	(b) Parallel (d) Star
2	133	Which power station uses nuclear fission? (a) Thermal (c) Nuclear **Ans:Nuclear**	(b) Hydro (d) Solar
2	134	Which source is non-renewable? (a) Wind (c) Natural gas **Ans:Natural gas**	(b) Hydro (d) Solar
2	135	Transformer works on principle of: (a) Electrostatics (c) Ohm's law **Ans:Electromagnetic induction**	(b) Electromagnetic induction (d) Magnetoresistance
2	136	Common fan motor type: (a) DC motor (c) Synchronous motor **Ans:Induction motor**	(b) Induction motor (d) Servo motor
2	137	Which energy source depends on wind? (a) Hydro (c) Solar **Ans:Wind**	(b) Wind (d) Geothermal
2	138	Lamp with tungsten filament is: (a) LED (c) CFL **Ans:Incandescent**	(b) Incandescent (d) Halogen
2	139	Power station using geothermal steam is: (a) Thermal (c) Nuclear **Ans:Geothermal**	(b) Geothermal (d) Hydro
2	140	The rotating part of a motor is called: (a) Rotor (c) Commutator **Ans:Rotor**	(b) Stator (d) Brush

UNIT	Q NO	QUESTIONS
3	141	Which of these is a passive component? (a) Transistor (b) Diode (c) Resistor (d) SCR **Ans:Resistor**
3	142	The primary property of a resistor is to: (a) Store charge (b) Oppose current flow (c) Store energy in a magnetic field (d) Amplify signal **Ans:Oppose current flow**
3	143	Which symbol represents a variable resistor? (a) Zig-zag line (b) Zig-zag line with arrow (c) Two parallel lines (d) Coil **Ans:Zig-zag line with arrow**
3	144	In electronics, the unit of resistance is: (a) Ohm (b) Henry (c) Farad (d) Watt **Ans:Ohm**
3	145	A capacitor stores energy in the form of: (a) Magnetic field (b) Electric field (c) Chemical energy (d) Heat **Ans:Electric field**
3	146	The unit of capacitance is: (a) Ohm (b) Farad (c) Volt (d) Henry **Ans:Farad**
3	147	Which component stores energy in a magnetic field? (a) Capacitor (b) Resistor (c) Inductor (d) Transformer **Ans:Inductor**
3	148	The SI unit of inductance is: (a) Farad (b) Ohm (c) Henry (d) Volt **Ans:Henry**
3	149	The color code for a resistor with value 470Ω is: (a) Yellow-Violet-Brown (b) Red-Red-Brown (c) Green-Blue-Brown (d) Blue-Green-Brown **Ans:Yellow-Violet-Brown**
3	150	A resistor of 220Ω with 5% tolerance will have a tolerance band color of: (a) Red (b) Brown (c) Green (d) Gold **Ans:Gold**

UNIT	Q NO	QUESTIONS	
3	151	Which type of capacitor is non-polarized?	
		(a) Electrolytic	(b) Ceramic
		(c) Tantalum	(d) Aluminium
		Ans:Ceramic	
3	152	In a resistor color code, the third band represents:	
		(a) First digit	(b) Second digit
		(c) Multiplier	(d) Tolerance
		Ans:Multiplier	
3	153	A resistor with Red-Violet-Orange bands has a value of:	
		(a) 27kΩ	(b) 2.7kΩ
		(c) 270Ω	(d) 27Ω
		Ans:27kΩ	
3	154	The inductance of a coil increases if:	
		(a) Number of turns decreases	(b) Core is removed
		(c) Permeability of core increases	(d) Wire thickness decreases
		Ans:Permeability of core increases	
3	155	Which component resists a change in current?	
		(a) Resistor	(b) Capacitor
		(c) Inductor	(d) LED
		Ans:Inductor	
3	156	Which factor affects the capacitance of a capacitor?	
		(a) Plate area	(b) Plate distance
		(c) Dielectric material	(d) All of these
		Ans:All of these	
3	157	Self-inductance is measured in:	
		(a) Farads	(b) Henry
		(c) Ohms	(d) Volts
		Ans:Henry	
3	158	The mutual inductance between two coils depends on:	
		(a) Distance between coils	(b) Orientation of coils
		(c) Number of turns	(d) All of these
		Ans:All of these	
3	159	An inductor connected to DC will initially:	
		(a) Allow zero current	(b) Allow maximum current
		(c) Short circuit	(d) Block voltage
		Ans:Allow zero current	
3	160	A resistor’s function in a circuit is mainly to:	
		(a) Control voltage	(b) Control current
		(c) Store charge	(d) Generate power
		Ans:Control current	

UNIT	Q NO	QUESTIONS
3	161	The reactance of a capacitor decreases with: (a) Increasing frequency (b) Decreasing frequency (c) Increasing resistance (d) Constant voltage **Ans:Increasing frequency**
3	162	The reactance of an inductor increases with: (a) Increasing frequency (b) Decreasing frequency (c) Increasing voltage (d) Increasing capacitance **Ans:Increasing frequency**
3	163	Which type of resistor changes resistance with temperature? (a) LDR (b) Potentiometer (c) Thermistor (d) Fixed resistor **Ans:Thermistor**
3	164	Which type of capacitor can be used in AC circuits without polarity concerns? (a) Electrolytic (b) Polarized (c) Non-polarized (d) Aluminium **Ans:Non-polarized**
3	165	In resistor color code, the gold band indicates: (a) ±10% tolerance (b) ±5% tolerance (c) ±2% tolerance (d) ±1% tolerance **Ans:±5% tolerance**
3	166	What happens if a capacitor is connected with wrong polarity in DC? (a) Works normally (b) Explodes/damages (c) Stores more charge (d) Increases capacitance **Ans:Explodes/damages**
3	167	The inductance of a coil is directly proportional to: (a) Number of turns^2 (b) Voltage (c) Resistance (d) Capacitance **Ans:Number of turns^2**
3	168	Which type of inductor core provides maximum inductance? (a) Air core (b) Ferrite core (c) Wooden core (d) Plastic core **Ans:Ferrite core**
3	169	Which property of a capacitor is affected by the dielectric material? (a) Voltage rating (b) Capacitance (c) Resistance (d) Frequency **Ans:Capacitance**
3	170	Which symbol represents an inductor? (a) Coil (b) Zig-zag line (c) Parallel lines (d) Arrow **Ans:Coil**

UNIT	Q NO	QUESTIONS
3	171	Which type of resistor can be adjusted manually? (a) Fixed resistor (b) Potentiometer (c) Thermistor (d) Varistor **Ans:Potentiometer**
3	172	The energy stored in an inductor is given by: (a) ½CV² (b) ½LI² (c) VI (d) IR² **Ans:½LI²**
3	173	Which type of resistor changes resistance with light? (a) Thermistor (b) Varistor (c) LDR (d) Fixed resistor **Ans:LDR**
3	174	The unit of mutual inductance is: (a) Ohm (b) Henry (c) Volt (d) Farad **Ans:Henry**
3	175	Which component opposes AC more at higher frequencies? (a) Capacitor (b) Inductor (c) Resistor (d) Diode **Ans:Inductor**
3	176	A 100μF capacitor stores more charge than a 10μF capacitor at the same voltage because: (a) Larger area plates (b) More turns (c) Higher inductance (d) Lower resistance **Ans:Larger area plates**
3	177	The time constant of an RC circuit is: (a) R×L (b) L/R (c) R×C (d) C/R **Ans:R×C**
3	178	In a parallel circuit, the voltage across each resistor is: (a) Same (b) Different (c) Zero (d) Depends on current **Ans:Same**
3	179	The main loss in a resistor is: (a) Magnetic loss (b) Eddy current loss (c) Heat loss (d) Dielectric loss **Ans:Heat loss**
3	180	The inductive reactance formula is: (a) XL = 2πfL (b) XC = 1/2πfC (c) XL = I×R (d) XC = 2πfC **Ans:XL = 2πfL**

UNIT	Q NO	QUESTIONS
3	181	Which type of capacitor is best for high-frequency applications? (a) Ceramic (b) Electrolytic (c) Tantalum (d) Aluminium **Ans:Ceramic**
3	182	An iron-core inductor is mainly used in: (a) High-frequency circuits (b) Low-frequency circuits (c) RF applications (d) Digital circuits **Ans:Low-frequency circuits**
3	183	Which parameter of a capacitor indicates its ability to withstand voltage? (a) ESR (b) Dielectric strength (c) Reactance (d) Frequency **Ans:Dielectric strength**
3	184	The resistance of a conductor increases with: (a) Increase in temperature (b) Decrease in temperature (c) Increase in length (d) Both 1 and 3 **Ans:Both 1 and 3**
3	185	Which type of inductor is most suitable for compact circuits? (a) Air core (b) Toroidal (c) Iron core (d) Large coil **Ans:Toroidal**
3	186	Which color represents digit ‘5’ in resistor code? (a) Green (b) Blue (c) Yellow (d) Orange **Ans:Green**
3	187	The capacitor used for power factor improvement is: (a) Electrolytic (b) Oil-filled (c) Ceramic (d) Tantalum **Ans:Oil-filled**
3	188	A variable inductor is mainly used for: (a) Adjusting capacitance (b) Tuning circuits (c) Increasing resistance (d) Reducing frequency **Ans:Tuning circuits**
3	189	Which property of an inductor resists sudden changes in current? (a) Capacitance (b) Reactance (c) Inductance (d) Resistance **Ans:Inductance**
3	190	The dielectric constant of a material affects: (a) Capacitance (b) Resistance (c) Inductance (d) Current **Ans:Capacitance**

UNIT	Q NO	QUESTIONS
3	191	Component that opposes current flow: (a) Resistor (b) Capacitor (c) Inductor (d) Diode **Ans:Resistor**
3	192	Capacitor stores energy in: (a) Magnetic field (b) Electric field (c) Kinetic energy (d) Chemical energy **Ans:Electric field**
3	193	Inductor stores energy in: (a) Magnetic field (b) Electric field (c) Thermal energy (d) Chemical energy **Ans:Magnetic field**
3	194	Resistor type made of carbon composition: (a) Wire-wound (b) Carbon film (c) Metal film (d) Variable **Ans:Carbon film**
3	195	Colour code red-violet-orange is: (a) 27 Ω (b) 2.7 kΩ (c) 270 Ω (d) 27 kΩ **Ans:27 kΩ**
3	196	Inductor property resisting change in current: (a) Capacitance (b) Inductance (c) Resistance (d) Conductance **Ans:Inductance**
3	197	Mutual inductance exists between: (a) One coil (b) Two coils (c) Capacitors (d) Resistors **Ans:Two coils**
3	198	Capacitor type with polarity: (a) Electrolytic (b) Ceramic (c) Mica (d) Paper **Ans:Electrolytic**
3	199	Property of resistor that stays constant: (a) Inductance (b) Resistance (c) Capacitance (d) All **Ans:Resistance**
3	200	Self-inductance unit: (a) Ohm (b) Henry (c) Farad (d) Tesla **Ans:Henry**

UNIT	Q NO	QUESTIONS	
3	201	Iron core increases inductor's:	
		(a) Lower inductance	(b) Higher inductance
		(c) Zero inductance	(d) Constant inductance
		Ans:Higher inductance	
3	202	Small non-polarized capacitor type:	
		(a) Ceramic	(b) Electrolytic
		(c) Tantalum	(d) Supercap
		Ans:Ceramic	
3	203	Resistor value measured with:	
		(a) Voltmeter	(b) Ohmmeter
		(c) Ammeter	(d) Wattmeter
		Ans:Ohmmeter	
3	204	Component used for tuning radios:	
		(a) Inductor	(b) Resistor
		(c) Transformer	(d) Switch
		Ans:Inductor	
3	205	Capacitance is measured in:	
		(a) Ohm	(b) Farad
		(c) Henry	(d) Tesla
		Ans:Farad	
3	206	Resistor to adjust volume:	
		(a) Fixed	(b) Variable
		(c) Wire-wound	(d) Carbon
		Ans:Variable	
3	207	In inductors, current lags voltage by:	
		(a) 0°	(b) 90°
		(c) 180°	(d) 270°
		Ans:90°	
3	208	Component allowing DC but blocking AC:	
		(a) Inductor	(b) Capacitor
		(c) Resistor	(d) Diode
		Ans:Inductor	
3	209	Capacitors in series have capacitance:	
		(a) Sum	(b) Less than smallest
		(c) More than largest	(d) Equal
		Ans:Less than smallest	
3	210	Colour code black-brown-red is:	
		(a) 1 kΩ	(b) 100 Ω
		(c) 10 kΩ	(d) 1 Ω
		Ans:100 Ω	

UNIT	Q NO	QUESTIONS
4	211	Which of the following is a semiconductor material? (a) Copper (b) Silicon (c) Iron (d) Glass **Ans:Silicon**
4	212	The atomic number of silicon is: (a) 12 (b) 14 (c) 16 (d) 32 **Ans:14**
4	213	The atomic number of germanium is: (a) 14 (b) 32 (c) 28 (d) 30 **Ans:32**
4	214	The number of valence electrons in silicon is: (a) 2 (b) 4 (c) 6 (d) 8 **Ans:4**
4	215	A pure semiconductor is called: (a) Doped semiconductor (b) Intrinsic semiconductor (c) Extrinsic semiconductor (d) Alloy **Ans:Intrinsic semiconductor**
4	216	The conductivity of a semiconductor increases with: (a) Decreasing temperature (b) Increasing temperature (c) Increasing resistance (d) Decreasing voltage **Ans:Increasing temperature**
4	217	In an intrinsic semiconductor, the number of electrons is: (a) Greater than holes (b) Less than holes (c) Equal to holes (d) Zero **Ans:Equal to holes**
4	218	Doping increases: (a) Resistivity (b) Conductivity (c) Band gap (d) Insulation **Ans:Conductivity**
4	219	Pentavalent impurities produce: (a) N-type semiconductor (b) P-type semiconductor (c) Insulator (d) Conductor **Ans:N-type semiconductor**
4	220	Trivalent impurities produce: (a) N-type semiconductor (b) P-type semiconductor (c) Insulator (d) Conductor **Ans:P-type semiconductor**

UNIT	Q NO	QUESTIONS	
4	221	Which is a pentavalent impurity?	
		(a) Boron	(b) Gallium
		(c) Arsenic	(d) Indium
		Ans:Arsenic	
4	222	Which is a trivalent impurity?	
		(a) Boron	(b) Phosphorus
		(c) Arsenic	(d) Antimony
		Ans:Boron	
4	223	The majority carriers in N-type semiconductors are:	
		(a) Holes	(b) Electrons
		(c) Protons	(d) Photons
		Ans:Electrons	
4	224	The majority carriers in P-type semiconductors are:	
		(a) Electrons	(b) Holes
		(c) Protons	(d) Photons
		Ans:Holes	
4	225	The minority carriers in N-type semiconductors are:	
		(a) Holes	(b) Electrons
		(c) Neutrons	(d) None
		Ans:Holes	
4	226	The minority carriers in P-type semiconductors are:	
		(a) Electrons	(b) Holes
		(c) Neutrons	(d) None
		Ans:Electrons	
4	227	Energy gap of silicon is about:	
		(a) 1.1 eV	(b) 0.7 eV
		(c) 2.0 eV	(d) 3.2 eV
		Ans:1.1 eV	
4	228	Energy gap of germanium is about:	
		(a) 1.1 eV	(b) 0.7 eV
		(c) 2.0 eV	(d) 3.2 eV
		Ans:0.7 eV	
4	229	The forbidden energy gap in insulators is typically:	
		(a) < 1 eV	(b) 1-3 eV
		(c) > 5 eV	(d) 0 eV
		Ans:> 5 eV	
4	230	Doping with pentavalent atoms adds:	
		(a) Free electrons	(b) Holes
		(c) Neutrons	(d) Photons
		Ans:Free electrons	

UNIT	Q NO	QUESTIONS
4	231	Doping with trivalent atoms adds: (a) Free electrons (b) Holes (c) Neutrons (d) Photons **Ans:Holes**
4	232	Which process introduces impurities into a semiconductor? (a) Insulation (b) Diffusion (c) Conduction (d) Polarization **Ans:Diffusion**
4	233	The resistivity of a semiconductor is: (a) High (b) Medium (c) Low (d) Zero **Ans:Medium**
4	234	A donor atom donates: (a) Hole (b) Electron (c) Proton (d) Photon **Ans:Electron**
4	235	An acceptor atom accepts: (a) Hole (b) Electron (c) Proton (d) Photon **Ans:Electron**
4	236	The temperature coefficient of resistance for semiconductors is: (a) Positive (b) Negative (c) Zero (d) Infinite **Ans:Negative**
4	237	The conduction band contains: (a) Free electrons (b) Bound electrons (c) Holes (d) Ions **Ans:Free electrons**
4	238	The valence band contains: (a) Free electrons (b) Bound electrons (c) Holes only (d) Ions **Ans:Bound electrons**
4	239	In N-type semiconductor, conductivity is mainly due to: (a) Holes (b) Electrons (c) Protons (d) Neutrons **Ans:Electrons**
4	240	In P-type semiconductor, conductivity is mainly due to: (a) Electrons (b) Holes (c) Protons (d) Neutrons **Ans:Holes**

UNIT	Q NO	QUESTIONS
4	241	The unit of conductivity is: (a) Ω (b) Ω·m (c) S/m (d) V/m **Ans:S/m**
4	242	Which has higher conductivity at room temperature? (a) Copper (b) Silicon (c) Glass (d) Rubber **Ans:Copper**
4	243	At absolute zero, an intrinsic semiconductor behaves like: (a) Conductor (b) Insulator (c) Semiconductor (d) Superconductor **Ans:Insulator**
4	244	Increasing temperature in a semiconductor: (a) Increases carriers (b) Decreases carriers (c) Has no effect (d) Stops conduction **Ans:Increases carriers**
4	245	Mobility of charge carriers is measured in: (a) $m^2/V \cdot s$ (b) S/m (c) Ω·m (d) V/m **Ans:$m^2/V \cdot s$**
4	246	A semiconductor with equal electrons and holes is: (a) N-type (b) P-type (c) Intrinsic (d) Degenerate **Ans:Intrinsic**
4	247	In an intrinsic semiconductor, electron-hole pairs are generated by: (a) Doping (b) Heat energy (c) Light (d) Both 2 and 3 **Ans:Both 2 and 3**
4	248	The mobility of electrons in Si is: (a) Less than holes (b) More than holes (c) Equal to holes (d) Zero **Ans:More than holes**
4	249	The mobility of holes in Si is: (a) More than electrons (b) Less than electrons (c) Equal to electrons (d) Zero **Ans:Less than electrons**
4	250	In N-type semiconductors, the Fermi level lies: (a) Near conduction band (b) Near valence band (c) Midway (d) Below valence band **Ans:Near conduction band**

UNIT	Q NO	QUESTIONS
4	251	In P-type semiconductors, the Fermi level lies: (a) Near conduction band (b) Near valence band (c) Midway (d) Above conduction band **Ans:Near valence band**
4	252	Which semiconductor device works on light intensity? (a) LED (b) LDR (c) Photodiode (d) Varistor **Ans:Photodiode**
4	253	Which device emits light when forward biased? (a) Photodiode (b) LED (c) Varactor (d) SCR **Ans:LED**
4	254	A zener diode works in: (a) Forward bias (b) Reverse bias (c) Both (d) None **Ans:Reverse bias**
4	255	Which semiconductor device is used for voltage regulation? (a) LED (b) Zener diode (c) Varactor (d) Tunnel diode **Ans:Zener diode**
4	256	Which diode has negative resistance region? (a) LED (b) Tunnel diode (c) Zener diode (d) Varactor **Ans:Tunnel diode**
4	257	The depletion region is formed due to: (a) Majority carriers (b) Minority carriers (c) Ionized atoms (d) Current flow **Ans:Ionized atoms**
4	258	The width of depletion region increases with: (a) Forward bias (b) Reverse bias (c) Zero bias (d) All **Ans:Reverse bias**
4	259	The width of depletion region decreases with: (a) Forward bias (b) Reverse bias (c) Zero bias (d) None **Ans:Forward bias**
4	260	In forward bias, the barrier potential: (a) Increases (b) Decreases (c) Remains same (d) Becomes infinite **Ans:Decreases**

UNIT	Q NO	QUESTIONS
4	261	Material with conductivity between conductor and insulator: (a) Metal (b) Semiconductor (c) Superconductor (d) Insulator **Ans:Semiconductor**
4	262	In energy band theory, the highest filled band at 0 K is: (a) Conduction band (b) Forbidden band (c) Valence band (d) Fermi level **Ans:Valence band**
4	263	Fermi level is: (a) Top of conduction band (b) Bottom of conduction band (c) Energy level at 50% probability (d) Band gap **Ans:Energy level at 50% probability**
4	264	Pure semiconductor is called: (a) Intrinsic (b) Extrinsic (c) N-type (d) P-type **Ans:Intrinsic**
4	265	Semiconductor doped with pentavalent atoms is: (a) N-type (b) P-type (c) Intrinsic (d) Degenerate **Ans:N-type**
4	266	Majority carriers in P-type are: (a) Electrons (b) Holes (c) Both (d) None **Ans:Holes**
4	267	Majority carriers in N-type are: (a) Electrons (b) Holes (c) Both (d) None **Ans:Electrons**
4	268	Current due to movement of electrons and holes is: (a) Drift (b) Diffusion (c) Leakage (d) Static **Ans:Diffusion**
4	269	Current due to electric field in semiconductor is: (a) Diffusion (b) Drift (c) Leakage (d) Static **Ans:Drift**
4	270	PN junction under forward bias has: (a) High resistance (b) Low resistance (c) Infinite resistance (d) Zero voltage **Ans:Low resistance**

UNIT	Q NO	QUESTIONS
4	271	Reverse bias causes PN junction current to be: (a) High (b) Low (c) Constant (d) Negative **Ans:Low**
4	272	Zener diode is mainly used for: (a) Rectification (b) Voltage regulation (c) Amplification (d) Switching **Ans:Voltage regulation**
4	273	In VI characteristics of PN diode, cut-in voltage for silicon is approx: (a) 0.1 V (b) 0.3 V (c) 0.7 V (d) 1.2 V **Ans:0.7 V**
4	274	Zener breakdown occurs due to: (a) Avalanche effect (b) Tunneling (c) Thermal effect (d) Joule heating **Ans:Tunneling**
4	275	Which device works in both forward and reverse bias regions? (a) PN diode (b) Zener diode (c) LED (d) Varactor **Ans:Zener diode**
4	276	Forward bias reduces: (a) Barrier potential (b) Carrier concentration (c) Temperature (d) Doping **Ans:Barrier potential**
4	277	Reverse bias increases: (a) Barrier potential (b) Current flow (c) Conductivity (d) Doping **Ans:Barrier potential**
4	278	Energy band gap for silicon is approx: (a) 0.3 eV (b) 0.7 eV (c) 1.1 eV (d) 1.5 eV **Ans:1.1 eV**
4	279	Avalanche breakdown is common in: (a) Low-voltage diodes (b) High-voltage diodes (c) LEDs (d) Photodiodes **Ans:High-voltage diodes**
4	280	In LEDs, light is emitted due to: (a) Electron-hole recombination (b) Heating (c) Tunneling (d) Ionization **Ans:Electron-hole recombination**

UNIT	Q NO	QUESTIONS	
5	281	A rectifier converts:	
		(a) AC to DC	(b) DC to AC
		(c) DC to DC	(d) AC to AC
		Ans:AC to DC	
5	282	A half-wave rectifier uses:	
		(a) One diode	(b) Two diodes
		(c) Four diodes	(d) Six diodes
		Ans:One diode	
5	283	A full-wave rectifier using a center-tap transformer uses:	
		(a) One diode	(b) Two diodes
		(c) Four diodes	(d) Six diodes
		Ans:Two diodes	
5	284	A bridge rectifier uses:	
		(a) One diode	(b) Two diodes
		(c) Four diodes	(d) Six diodes
		Ans:Four diodes	
5	285	The ripple frequency of a half-wave rectifier is:	
		(a) Equal to supply frequency	(b) Twice supply frequency
		(c) Half supply frequency	(d) Zero
		Ans:Equal to supply frequency	
5	286	The ripple frequency of a full-wave rectifier is:	
		(a) Equal to supply frequency	(b) Twice supply frequency
		(c) Half supply frequency	(d) Zero
		Ans:Twice supply frequency	
5	287	The maximum efficiency of a half-wave rectifier is:	
		(a) 0.406	(b) 0.812
		(c) 0.5	(d) 1
		Ans:0.406	
5	288	The maximum efficiency of a full-wave rectifier is:	
		(a) 0.406	(b) 0.812
		(c) 0.5	(d) 1
		Ans:0.812	
5	289	The PIV of a diode in half-wave rectifier is:	
		(a) Vm	(b) 2Vm
		(c) Vm/2	(d) $Vm\sqrt{2}$
		Ans:Vm	
5	290	The PIV of each diode in a center-tap full-wave rectifier is:	
		(a) Vm	(b) 2Vm
		(c) Vm/2	(d) $Vm\sqrt{2}$
		Ans:2Vm	

UNIT	Q NO	QUESTIONS
5	291	The PIV of each diode in a bridge rectifier is: (a) Vm (b) 2Vm (c) Vm/2 (d) Vm√2 **Ans:Vm**
5	292	In a half-wave rectifier, the average DC output voltage is: (a) Vm/π (b) 2Vm/π (c) Vm/2 (d) Vm **Ans:Vm/π**
5	293	In a full-wave rectifier, the average DC output voltage is: (a) Vm/π (b) 2Vm/π (c) Vm/2 (d) Vm **Ans:2Vm/π**
5	294	The RMS value of the output of a half-wave rectifier is: (a) Vm/2 (b) Vm/√2 (c) Vm/2√2 (d) Vm/π **Ans:Vm/2**
5	295	The RMS value of the output of a full-wave rectifier is: (a) Vm/2 (b) Vm/√2 (c) Vm/2√2 (d) Vm/π **Ans:Vm/√2**
5	296	A filter in a rectifier circuit is used to: (a) Increase AC component (b) Reduce AC component (c) Increase voltage (d) Reduce voltage **Ans:Reduce AC component**
5	297	A capacitor filter is connected: (a) In series with load (b) In parallel with load (c) In series with source (d) None **Ans:In parallel with load**
5	298	A choke filter uses: (a) Resistor (b) Capacitor (c) Inductor (d) Transformer **Ans:Inductor**
5	299	The ripple factor of a half-wave rectifier without filter is: (a) 1.21 (b) 0.48 (c) 1.57 (d) 0.707 **Ans:1.21**
5	300	The ripple factor of a full-wave rectifier without filter is: (a) 1.21 (b) 0.48 (c) 1.57 (d) 0.707 **Ans:0.48**

UNIT	Q NO	QUESTIONS
5	301	A bridge rectifier needs a transformer: (a) Center-tap (b) Step-up only (c) Step-down only (d) Not necessarily center-tap **Ans:Not necessarily center-tap**
5	302	Which rectifier gives higher DC output voltage for same input? (a) Half-wave (b) Full-wave (c) Both same (d) None **Ans:Full-wave**
5	303	The output of a half-wave rectifier contains: (a) Pure DC (b) DC with high ripple (c) Pure AC (d) Zero **Ans:DC with high ripple**
5	304	The purpose of a transformer in a rectifier is: (a) Voltage conversion & isolation (b) Only voltage conversion (c) Only isolation (d) Rectification **Ans:Voltage conversion & isolation**
5	305	Which rectifier has lower transformer utilization factor? (a) Half-wave (b) Full-wave (c) Bridge (d) All equal **Ans:Half-wave**
5	306	The transformer utilization factor (TUF) of a full-wave rectifier is: (a) 0.287 (b) 0.693 (c) 0.812 (d) 1 **Ans:0.693**
5	307	The transformer utilization factor of a bridge rectifier is: (a) 0.287 (b) 0.693 (c) 0.812 (d) 1 **Ans:0.812**
5	308	In a capacitor filter, increasing the capacitance will: (a) Increase ripple (b) Decrease ripple (c) No effect (d) Stop conduction **Ans:Decrease ripple**
5	309	In a choke filter, increasing inductance will: (a) Increase ripple (b) Decrease ripple (c) No effect (d) Stop conduction **Ans:Decrease ripple**
5	310	A π-filter consists of: (a) C only (b) L only (c) L-C-L (d) C-L-C **Ans:C-L-C**

UNIT	Q NO	QUESTIONS
5	311	Which has higher output voltage: (a) Half-wave (b) Bridge rectifier (c) Both same (d) None **Ans:Bridge rectifier**
5	312	For same load, which rectifier has highest efficiency? (a) Half-wave (b) Full-wave (c) Bridge (d) All same **Ans:Full-wave**
5	313	The load regulation of a rectifier improves with: (a) High ripple (b) Low ripple (c) No filter (d) Low efficiency **Ans:Low ripple**
5	314	The voltage regulation of a power supply is: (a) (VNL − VFL)/VFL × 100% (b) (VFL − VNL)/VNL × 100% (c) (VNL − VFL)/VNL × 100% (d) None **Ans:(VNL − VFL)/VFL × 100%**
5	315	The unit of ripple factor is: (a) Volt (b) Ampere (c) % or no unit (d) Ohm **Ans:% or no unit**
5	316	The efficiency of a rectifier is defined as: (a) DC output power / AC input power (b) AC output power / DC input power (c) DC output voltage / AC input voltage (d) None **Ans:DC output power / AC input power**
5	317	The main disadvantage of a half-wave rectifier is: (a) High ripple (b) Low ripple (c) High efficiency (d) No transformer needed **Ans:High ripple**
5	318	The main advantage of a bridge rectifier is: (a) No transformer (b) Lower PIV per diode (c) Higher PIV per diode (d) Lower output **Ans:Lower PIV per diode**
5	319	In a center-tap full-wave rectifier, each diode conducts for: (a) 180° (b) 90° (c) 360° (d) 45° **Ans:180°**
5	320	In a bridge rectifier, each diode conducts for: (a) 180° (b) 90° (c) 360° (d) 45° **Ans:180°**

UNIT	Q NO	QUESTIONS	
5	321	The waveform after a bridge rectifier is:	
		(a) Pure DC	(b) Pulsating DC
		(c) AC	(d) Constant voltage
		Ans:Pulsating DC	
5	322	The AC component in the output is called:	
		(a) Ripple	(b) Noise
		(c) Distortion	(d) Bias
		Ans:Ripple	
5	323	A zener diode in a power supply is used for:	
		(a) Rectification	(b) Filtering
		(c) Regulation	(d) Amplification
		Ans:Regulation	
5	324	In a rectifier, the load is connected:	
		(a) Before the diode	(b) After the filter
		(c) After the diode	(d) Both 2 and 3
		Ans:Both 2 and 3	
5	325	The RMS load current in a half-wave rectifier is:	
		(a) Im/2	(b) Im/√2
		(c) Im/2√2	(d) Im/π
		Ans:Im/2	
5	326	The RMS load current in a full-wave rectifier is:	
		(a) Im/2	(b) Im/√2
		(c) Im/2√2	(d) Im/π
		Ans:Im/√2	
5	327	The form factor is defined as:	
		(a) Vrms/Vavg	(b) Vavg/Vrms
		(c) $Vavg^2/Vrms$	(d) None
		Ans:Vrms/Vavg	
5	328	Form factor of a half-wave rectifier is:	
		(a) 1.11	(b) 1.57
		(c) 2	(d) 0.707
		Ans:1.57	
5	329	Form factor of a full-wave rectifier is:	
		(a) 1.11	(b) 1.57
		(c) 2	(d) 0.707
		Ans:1.11	
5	330	For a half-wave rectifier, Vavg = ___ × Vm:	
		(a) 0.318	(b) 0.637
		(c) 0.707	(d) 0.5
		Ans:0.318	

UNIT	Q NO	QUESTIONS
5	331	Electrical shock hazard is caused by: (a) Voltage alone (b) Current through body (c) Resistance alone (d) Magnetic field **Ans:Current through body**
5	332	Burns from electricity are due to: (a) Chemical reaction (b) Thermal effect (c) Magnetic flux (d) Ionization **Ans:Thermal effect**
5	333	Arc-blast is caused by: (a) Sudden current discharge (b) Magnetic field (c) Lightning (d) Ground fault **Ans:Sudden current discharge**
5	334	First aid priority in electrical accident: (a) Give water (b) Remove victim from source (c) Apply heat (d) Move to bright light **Ans:Remove victim from source**
5	335	Device used to protect against overcurrent: (a) Capacitor (b) Fuse (c) Switch (d) Resistor **Ans:Fuse**
5	336	Earthing prevents: (a) Voltage drop (b) Shock hazard (c) Power factor loss (d) Overvoltage **Ans:Shock hazard**
5	337	Device to protect buildings from lightning: (a) Transformer (b) Lightning arrester (c) Surge protector (d) Relay **Ans:Lightning arrester**
5	338	PCB stands for: (a) Printed Circuit Board (b) Power Control Box (c) Parallel Circuit Board (d) Primary Control Base **Ans:Printed Circuit Board**
5	339	Common PCB base material: (a) Copper (b) Bakelite (c) FR4 (d) Aluminum **Ans:FR4**
5	340	First step in PCB making: (a) Soldering (b) Drilling (c) Designing layout (d) Etching **Ans:Designing layout**

UNIT	Q NO	QUESTIONS
5	341	Solder is an alloy of: (a) Tin and lead (b) Copper and zinc (c) Iron and carbon (d) Nickel and chrome **Ans:Tin and lead**
5	342	Tool used to heat solder: (a) Hot plate (b) Soldering iron (c) Drill (d) Cutter **Ans:Soldering iron**
5	343	Safety precaution in soldering: (a) Use bare hands (b) Avoid ventilation (c) Wear safety glasses (d) Use water cooling **Ans:Wear safety glasses**
5	344	Flux in soldering is used to: (a) Increase resistance (b) Remove oxide layer (c) Lower temperature (d) Increase heat **Ans:Remove oxide layer**
5	345	Multi-layer PCB has: (a) One layer (b) Two layers (c) More than two (d) Single track **Ans:More than two**
5	346	Correct method to disconnect power: (a) Pull wires (b) Switch off breaker (c) Cut cable (d) Touch live wire **Ans:Switch off breaker**
5	347	Fires from electrical faults are usually: (a) Class A (b) Class B (c) Class C (d) Class D **Ans:Class C**
5	348	Lightning arrester works by: (a) Blocking voltage (b) Providing low resistance path to ground (c) Increasing voltage (d) Storing charge **Ans:Providing low resistance path to ground**
5	349	Soldering temperature must be: (a) Very high (b) Controlled (c) Random (d) As low as possible **Ans:Controlled**
5	350	Common cause of solder joint failure: (a) Proper cleaning (b) Overheating (c) Correct flux use (d) Proper heating time **Ans:Overheating**

3 MARKS		
UNIT	**Q.NO**	**QUESTIONS**
1	1	Differentiate AC & DC.
1	2	What are the uses of electricity in engineering.
1	3	Describe the duties and responsibility of electrical engineer.
1	4	Write a short nots on Power and Energy in electricity.
1	5	State the first and second law of Coulomb's in detail.
1	6	Write short notes on classification of materials based on electrical conductivity
1	7	Write a short notes on inductors in series.
1	8	Write a short notes on capacitor in parallel.
1	9	Differentiate Fleming right hand and left hand rule.
1	10	Compare between series circuit and parallel circuit of Resistors.
2	1	Write a Short note on Renewable Energy Sources.
2	2	Write a Short note on Non-Renewable Energy Sources.
2	3	What are the functions of TANGEDCO?
2	4	Write a Short note on power Stations.
2	5	Draw the Diagram of DC Machine and mark the parts.
2	6	Write a short note on types of Motors.
2	7	What are Applications of Generator.
2	8	Write a short note on transformer windings.
2	9	What are Applications of Motor.
2	10	What are Applications of Transformer.
3	1	Write a short note on Properties of Resistor.
3	2	Write short notes on types of resistors.
3	3	Write a short note on application of resistor.
3	4	Write a short note on working principle of capacitor.
3	5	Write a short note on properties of capacitor.
3	6	Write a short note on Electrolytic capacitors.
3	7	Write a short note on application of capacitors.
3	8	Write a short note on working principle of inductor.
3	9	Write a short note on application of inductor.
3	10	Compare Self and Mutual inductance.
4	1	Draw the energy band diagram of conductor, insulator, semi-conductor.
4	2	Write a short note on classification of semi-conductors.
4	3	Write a short note on P-type semi-conductors.
4	4	Write a short note on N-type semi-conductors.
4	5	Write a short note on PN Junction in forward bias.
4	6	Write a short note on PN Junction in reverse bias.

4	7	Write a short note on Specifications of PN diode.
4	8	Compare Zener break down and avalanche break down.
4	9	Write a short note on Specifications of Zener diode.
4	10	Draw the VI Characteristics of PN Junction and Zener diode.
5	1	Write a short note on effects of electricity on human body.
5	2	Write a short note on safety precautions while handling electricity.
5	3	Write short notes on protective devices in electricity.
5	4	Write a short note on earthing.
5	5	Write a short note on lightening arrester.
5	6	Write short notes on Multi-layer PCB.
5	7	Write a short note on Double side PCB.
5	8	Write a short note on lead alloy solders.
5	9	Write a short note on silver alloy solders.
5	10	Write a short notes on Soldering Safety Precautions.

Unit 1

1. Explain in detail about use of electricity in Engineering and Health Care
2. Explain in deail about classification of material based on electricital conductivity
3. Compare between series circuit and parellel circuit in resistive networks
4. I. If a circuit has three inductors of 50 Henry, 20 Henry and 30 Henry are connected in series without magnetic coupling. What will be total inductance of the circuit.
   II.If a circuit has two inductors of 10 H and 20 H are connected in parallel. What will be the total inductance of the circuit.
5. I.Find the equivalent capacitance for the system of capacitors 2 F, 2 F and 4 F added in a s eries combination.
   II.Find the equivalent capacitance for th e system of capacitors 3 F, 5 F, and 10 F added in parallel combination.

Unit 2

1. Draw and Explain the block diagram of AC transmission system.
2. Explain in detail about the various functions of TANGEDCO.
3. Briefly explain the various parts of AC Generator.
4. Briefly explain the main parts of a transformer.
5. List out the various uses of motor, generator and transformer.

Unit 3

1. Explain in detail about properties of resistor
2. Explain indetail about types of capacitors
3. Explain in detail about properties of inductor
4. Explain in detail about color coding of resistors
5. Explain in detail about Self and Mutual inductance

Unit 4

1. Explain in detail about classification of Semi-conductors
2. Explain in detail about P type and N type semi conductor
3. Explain the construction and working principle of PN Junction Diode
4. Explain the construction and working principle of Zener Diode
5. Explain specifications of PN Junction and Zener diode

Unit 5

1. Briefly explain the different hazards caused due to electrical accidents
2. Briefly explain about the various protective devices used to provide electrical safety
3. Explain in detail about importance of Earthing
4. Briefly explain the lighting arrestor
5. What are the precaution steps to be followed against the electrical safety?