DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER: SIXTH SEMESTER

NAME OF THE COURSE: Design of Machine Elements

PAPERCODE: DIP- 601

RATIONAL

Machine Design Engineering is an application of principles of Engineering and mathematics and physics for creating objects, mechanisms, machines, and tools. It involves a combination of different machine elements such as mechanical, materials thermal, electrical, and hydraulic components. Designers use machine drawings to describe a product in detail. They must have knowledge of mechanics and materials to ensure that the designed machines are operational. Any person with an interest in the field must have a thorough understanding of mechanical engineering and design

CO's of Design of Machine Elements

CO1: Understand the principles, objectives, and methodology of machine design, including material selection and design constraints.
CO2: Analyze components for strength, stiffness, and stability under various types of loading, using theories of failure.
CO3: Design basic machine elements such as shafts, keys, couplings, fasteners, joints, springs, and power transmission elements.
CO4: Design cams, clutches, brakes, and other mechanisms for specific motion, torque, or energy transmission requirements.
CO5: Apply principles of fatigue, wear, and environmental effects

DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER: SIXTH SEMESTER

NAME OF THE COURSE: Design of Machine Elements

PAPERCODE: DIP- 601

Unit No.	COURSE CONTENT
1	**UNIT-I: Introduction to Design:** Machine Design philosophy and Procedures; General Considerations in Machine Design; Fundamentals: Types of loads, concepts of stress, Strain, Stress – Strain Diagram for Ductile and Brittle Materials, Types of Stresses; Bearing pressure Intensity; Crushing; Bending and Torsion; Principal Stresses; Simple Numericals; Creep strain and Creep Curve; Fatigue; S-N curve; Endurance Limit; Factor of Safety and Factors governing selection of factor of Safety; Stress Concentration: Causes & Remedies; Converting actual load or torque into design load or torque using design factors like velocity factor, factor of safety & service factor; Properties of Engineering materi- als; Designation of materials as per IS and introduction to International standards & advantages of standardization; Use of design data book; Use of standards in design and preferred numbers series; Theories of Elastic Failures; Principal normal stress theory; Maximum shear stress theory & Maxi- mum distortion energy theory.
2	**UNIT-II: Design of simple machine parts:** Cotter Joint; Knuckle Joint; Turnbuckle; Design of Levers: Hand/Foot Lever & Bell Crank Lever; Design of C–Clamp; Off-set links; Overhang Crank; Arm of Pulley.
3	**UNIT-III: Antifriction Bearings:** Classification of Bearings; Sliding contact & Rolling contact; Terminology of Ball bearings: Life Load relationship, Basic static load rating and Basic dynamic load rating, limiting speed; Selection of ball bearings using manufacturer's catalogue
4	**UNIT-IV: Design of Springs:** Types of springs: compression, tension, torsion, leaf springs. Material selection and design calculations. Springs under static and fluctuating loads. Applications in mechanical systems.
5	**UNIT-V:Cams, Clutches, and Brakes:** Design of cam profiles for desired follower motion. Types of clutches: friction and centrifugal; design for torque transmission. Brakes: types, design for stopping power and energy dissipation.

REFERENCE BOOK'S

1 Design of Machine Elements V. B. Bhandari Tata Mc Graw-Hill Education, Latest Edition
2 Machine Design R. S. Khurmi & J. K. Gupta S. Chand & Company, Latest Edition
3 Machine Design P. C. Sharma & D. K. Aggarwal S. K. Kataria & Sons, Latest Edition
4 Design of Machine Elements T. H. Chandratre & V. V. Kale Nirali Prakashan, Pune
5 Machine Design Data Book K. Mahadevan & Balaveera Reddy CBS Publishers, Latest Edition
6 Machine Design: An Integrated Approach A. H. Patel Technical Publications, Pune
7 Fundamentals of Machine Design J. G. Joshi & M. B. Bangar Tech-Max Publications
8 A Textbook of Machine Design S. S. Rao New Age International Publishers
9 Design Data Handbook for Mechanical Engineers K. Lingaiah McGraw-Hill Education
10 Machine Design Simplified P. C. Gope PHI Learning Pvt. Ltd.

DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER: SIXTH SEMESTER

NAME OF THE COURSE: EV Technology

PAPERCODE: DIP- 602 A

RATIONAL

Emerging climate change concerns, worldwide, have been coupled with technological advancements in the automotive sector, and this has given rise to the need of electric vehicles (EVs). Electric Vehicles can play a vital role in combating climate change across the globe by helping to cut down the emissions and reducing dependence on fossil fuels. This subject highlights the different types of electric vehicles, environmental advantages and other aspect.

CO'S of EV Technology

CO1: Explain the fundamentals, architecture, and classification of Electric and Hybrid Electric Vehicles (EVs/HEVs).
CO2: Identify and compare various electric motors and drive systems used in EVs and analyze their performance characteristics.
CO3: Describe the construction, working, and management of battery and energy storage systems used in EVs.
CO4: Explain the role and operation of power electronic converters, controllers, and sensors in electric vehicle control systems.
CO5: Interpret various EV charging methods, infrastructure components, and grid integration concepts.
CO6: Discuss hybrid, fuel cell, and advanced EV technologies with respect to sustainability, efficiency, and future trends.

DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER: SIXTH SEMESTER

NAME OF THE COURSE: EV Technology

PAPERCODE: DIP- 602 A

Unit No.	**COURSE CONTENT**
1	**Introduction to EV & HEV :** Definition, need and advantages of Electric Vehicles (EVs) and Hybrid Electric Vehicles (HEVs) , Types of EVs & HEVs (Battery EV, Hybrid, Plug-in HYB, Series/Parallel), Comparison: EV vs. IC Engine vehicles (emissions, cost, maintenance), Trends, regulations, Government policies in India, EV architecture: main components, layout, component interconnection.
2	**Electric Motors & Drives:** Types of motors used in EVs (DC, AC induction, Brushless DC (BLDC), Permanent Magnet Synchronous Motor (PMSM)), Motor performance parameters: torque-speed characteristics, efficiency, Motor control techniques: inverters, PWM drives, field weakening, Regenerative braking principle, Drive train configurations including fixed & variable gearing, in-wheel motor drives.
3	**Battery & Energy Storage Systems:** Types of batteries used in EVs: Lead-acid, Li-ion, $LiFePO_4$, etc. Battery characteristics: capacity, energy density, state of charge (SOC), state of health (SOH), Battery management systems (BMS): architecture and functions, Thermal management of batteries, Safety, charging/discharging cycles, degradation, and life prediction.
4	**Power Electronics and Control Systems:** Components: DC-DC converters, DC-AC inverters, controllers Control strategies for motor and battery management, Sensors used (current, voltage, temperature, speed) and their interfacing , Safety circuits and protection (over/ under voltage, short circuits, etc.) , Communication protocols and embedded control in EVs
5	**Charging Infrastructure & Grid Integration:** Types of charging: AC charging (slow, fast), DC fast charging, wireless charging, Charging stations: design, connectors and standards (India and international), Battery swapping models, Impacts on grid: load management, smart charging, Vehicle-to-Grid (V2G) & Grid-to-Vehicle (G2V) concepts, Safety, regulatory and installation standards.
6	**Hybrid & Advanced EV Technologies:** Hybrid EVs: classification, architecture (series, parallel, series-parallel), Fuel cell EVs: working principles, hydrogen as fuel, fuel cell stacks, Emerging technologies: ultra-capacitors, solid-state batteries, wireless power, autonomous & connected EVs, Lifecycle assessment & environmental impact of EV manufacturing and disposal.

LIST OF EXPERIMENTS

1. Study of basic layout and components of an Electric Vehicle (EV) and Hybrid Electric Vehicle (HEV).
2. Demonstration of different types of electric motors used in EVs (BLDC, PMSM, and Induction Motor).
3. Performance testing of a BLDC motor using a simulation or lab setup.
4. Study of various battery types used in EVs – Lead-Acid, Li-ion, NiMH – and their characteristics.
5. Measurement of State of Charge (SOC) and Depth of Discharge (DOD) in an EV battery pack.
6. Demonstration of Battery Management System (BMS) operation using trainer kit or simulation software.
7. Study of different power electronic converters (DC-DC, DC-AC, AC-DC) used in EVs.
8. Demonstration of motor control through an inverter and controller setup.
9. Study of EV charging systems – slow, fast, and regenerative charging; observe a real or simulated EV charger.
10. Demonstration of charging infrastructure and connector standards (AC Type-1, Type-2, DC fast chargers).
11. Study of regenerative braking mechanism and its energy recovery process in EVs.
12. Case study on hybrid, plug-in hybrid, and fuel-cell electric vehicles – configuration and working.
13. Energy consumption and range estimation experiment for a given electric vehicle setup.
14. Study of safety precautions and protective devices in EV systems.
15. Mini-project: Design or simulation of a simple EV power train using MATLAB / Simulink / equivalent software.

REFERENCE BOOK'S

1. Electric and Hybrid Vehicles S. Ramakrishnan Pearson Education, Latest Edition
2. Electric Vehicle Technology Explained James Larminie & John Lowry Wiley India Pvt. Ltd., 2nd Edition
3. Electric Vehicles and Hybrid Electric Vehicles Dr. K. Venkataraman PHI Learning Pvt. Ltd.
4. Fundamentals of Electric Vehicle Technology Ehsan Ali & M. A. Chaudhari Khanna Publishers
5. Automobile Engineering Vol. II (Electric & Hybrid Vehicles) Kirpal Singh Standard Publishers Distributors
6. Electric Vehicle Technology S. S. ThipseJaico Publishing House
7. Hybrid Electric Vehicles: Principles and Applications with Practical Perspectives Chris Mi, M. Abul Masrur & D. W. Gao Wiley India Pvt. Ltd.
8. Electric Vehicle Engineering S. K. Jain Khanna Publishers

DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER: SIXTH SEMESTER

NAME OF THE COURSE: Introduction of Drone Technology

PAPERCODE: DIP- 603A

RATIONAL

Drones are unmanned aerial vehicles. Drones are a kind of air vehicles that fly without any actual pilot or crew on board. It referred as unpiloted aircraft. Light composite materials make up UAVs (Unmanned Aerial Vehicles), reducing their weight and increasing their strength and maneuverability. Professionals and individuals now use drones, which were initially used by the military. Various fields use drones. Areas such as construction, defense, photography, marketing, delivery, agriculture, rescue, and entertainment can use drones. Knowledge of drones and its technology are essential for the students for run with cutting edge era.

CO'S of Drone Technology

CO1: Explain the basic principles, classification, and applications of drones and unmanned aerial vehicles (UAVs).
CO2: Identify and describe various airframe structures, materials, and aerodynamic concepts used in drones.
CO3: Explain the working principles and selection criteria of propulsion systems, motors, ESCs, and batteries used in drones.
CO4: Demonstrate understanding of navigation, sensors, flight controllers, and control mechanisms used in UAVs.
CO5: Use mission planning software and tools for autonomous flight operation, data collection, and analysis.
CO6: Follow drone safety standards, perform preventive maintenance, and discuss recent trends and regulatory developments in drone technology.

DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER: SIXTH SEMESTER

NAME OF THE COURSE: Introduction of Drone Technology

PAPERCODE: DIP- 603A

Unit No	**COURSE CONTENT**
1	**Introduction to Drones / UAVs:** History and evolution of unmanned aerial vehicles, Types of drones (fixed wing, rotary wing, hybrid VTOL), Applications: agriculture, surveillance, delivery, mapping, entertainment, Regulatory, legal and ethical considerations, Performance parameters (payload, flight time, range).
2	**Airframe, Materials, and Aerodynamics:** Drone structure: frame types and materials (carbon fiber, composites, aluminum), Aerodynamics basics: lift, drag, thrust, weight, Propellers: types, pitch, diameter, effect on performance, Center of gravity and weight distribution, Drone stability and control surfaces or mechanisms
3	**Power Systems & Propulsion:** Electric motors (brushless, brushed), motor selection, Electronic Speed Controllers (ESCs), propeller-motor matching, Battery types used (LiPo, Li-ion etc.), battery capacity & discharge rates, Power system efficiency, thermal management, Charging methods and safety
4	**Navigation, Sensors & Control Systems:** Sensors: IMU (accelerometer, gyroscope), magnetometer, altimeter, GPS, Flight controllers and firmware basics, PID control loops, state estimation, Autonomous vs manual control modes, Telemetry, communication links (radio, wifi, RF)
5	**Software, Mission Planning & Autonomous Operation:** Mission planning software, waypoints, path planning, Geofencing and fail-safe modes, Autonomous flight: obstacle detection, computer vision basics, Firmware update & configuration tools, Data collection and processing (images, video, mapping)
6	**Safety, Maintenance & Emerging Trends :** Pre-flight inspection, safety checklists, Preventive and corrective maintenance of drones, Troubleshooting common issues (motor, battery, sensors), Regulations including DGCA / local aviation authority, Emerging trends: BVLOS (Beyond Visual Line of Sight), drone swarms, hybrid drones, hybrid payloads

LIST OF EXPERIMENTS

1. Introduction & Component Identification — Identify drone parts (frame, motors, ESCs, flight controller, propellers, battery, GPS, telemetry).
2. Basic Electronics & Soldering Practice — Soldering ESC, power distribution, connector assembly and safety.
3. Motor & Propeller Testing — Static motor run tests, thrust measurement, motor-propeller matching.
4. Battery Testing & Management — Measure capacity, internal resistance, SOC/DOD basics, safe charging/discharging procedures.
5. ESC Calibration & Radio Link Setup — Calibrate ESCs, bind transmitter/receiver, check failsafe and range.
6. Flight Controller Setup & Firmware Flashing — Install and configure flight controller firmware (e.g., ArduPilot / Betaflight), set basic parameters.
7. Sensor Calibration — Calibrate IMU (accelerometer/gyro), magnetometer (compass), barometer, and GPS.
8. Pre-flight Checklist & Safety Drill — Perform preflight inspection, checklist execution, emergency procedures.
9. Manual Flight (Basic) Practice — Controlled takeoff, hover, basic maneuvers, safe landing under supervision.
10PID Tuning & Stability Tests — Tune PID loops for stable flight; log/plot IMU data and analyze response.
11. Autonomous Waypoint Mission (Simulation) — Plan and execute waypoint mission in simulator (e.g., Mission Planner / QGroundControl).
12. Autonomous Waypoint Mission (Field) — Execute simple waypoint mission outdoors with safety supervision.
13 Payload Integration & Drop Mechanism — Mount a small payload, balance CG, demonstrate pick/drop mechanism or camera gimbal.
14. Obstacle Avoidance / Sensor Fusion Demo — Demo obstacle detection using ultrasonic / optical sensors or rangefinders (simulator/bench).
15 Troubleshooting & Fault Diagnosis — Simulate common faults (ESC fail, GPS drift, motor fault) and carry out corrective actions.

REFERENCE BOOK'S

1. Introduction to UAV Systems Paul G. Fahlstrom & Thomas J. Gleason Wiley India Pvt. Ltd., 4th Edition
2 Drones: The Ultimate Guide Adam Juniper D K Publishing / Pearson India
3 Drone Technology: Principles and Applications Dr. A. K. Maini Mc Graw Hill Education India
4 Unmanned Aerial Vehicles: Design and Development K. V. Ramana & R. R. Kishore I.K. International Publishing House, New Delhi
5 Aerospace Engineering with Drones S. K. Sharma Khanna Book Publishing Co. (India)
6 Unmanned Aircraft Systems: UAVS Design, Development and Deployment Reg Austin Wiley India Pvt. Ltd., 2nd Edition
7 Drone Engineering and Operations Dr. Rajesh Kumar, Dr. T. Shanmugasundaram Narosa Publishing House, India
8 Drone Technology Fundamentals P. K. Sinha & S. S. SalujaS. Chand & Company Pvt. Ltd.
9 Quadcopter and Drone RoboticsDr. R. K. RajputLaxmi Publications, New Delhi
10 Artificial Intelligence for DronesProf. A. V. Joshi Tech-Neo Publications, Pune

DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER: SIXTH SEMESTER

NAME OF THE COURSE: Refrigeration and Air Conditioning

PAPERCODE: DIP- 602 B

RATIONAL

For specific applications, efficiencies of both living and non-living beings depend to a great extent on the physical environment. The nature keeps conditions in the physical environment in the dynamic state ranging from one extreme to the other. Temperature, humidity, pressure and air motion are some of the important environment variables that at any location keep changing throughout the year. Adaptation to these many a times unpredictable variations is not possible and thus working efficiently is not feasible either for the living beings or the non- living ones. Thus for any specific purpose, control of the environment is essential. Refrigeration and air-conditioning is the subject who deals with the techniques to control the environments of the living and non-living subjects and thus provide them comforts to enable them to perform better and have longer lives.

CO'S of Refrigeration and Air Conditioning

CO1: Understand the fundamentals of refrigeration, air conditioning, and psychometrics, including basic concepts, units, and cycles.
CO2: Explain the components, operation, and performance of vapor compression refrigeration systems and air conditioning systems.
CO3: Identify and select appropriate refrigerants and secondary refrigerants based on properties, applications, and environmental considerations.
CO4: Calculate heat loads, cooling requirements, and analyze air conditioning processes for residential, commercial, and industrial applications.
CO5: Explain the role of controls, accessories, and safety devices in refrigeration and air conditioning systems and perform basic maintenance.
CO6: Understand advanced refrigeration systems, eco-friendly technologies, and emerging trends in air conditioning for sustainable applications.

DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER: SIXTH SEMESTER

NAME OF THE COURSE: Refrigeration and Air Conditioning

PAPERCODE: DIP- 602 B

Unit No.	**COURSE CONTENT**
1	**Introduction & Basic Concepts:** Definitions, need and scope of refrigeration, Units of refrigeration, COP, Refrigerating effect, Reversed Carnot cycle, limitations, Air refrigeration systems & their applications, Psychrometric terms and charts
2	**Vapor Compression Refrigeration System:** Components of VCR system: compressor, condenser, expansion device, evaporator, Working cycle on P–H and T–S charts, Subcooling, superheating, by-pass valve, Types of compressors: reciprocating, rotary, scroll, etc. • Condensers and evaporators: types and performance
3	**Refrigerants & Secondary Systems:** Desired properties of refrigerants, Classification, nomenclature, commonly used refrigerants and their properties, Ozone depletion and global warming potentials, Secondary refrigerants and brines, Their applications and selection
4	**Heat Load & Air Conditioning:** Heat gains: conduction, convection, radiation, ventilation, Cooling load estimation methods, Air conditioning processes: sensible, latent, total heat, Design of AC systems: window, split, central systems, Air distribution: ducting, diffusers, fans, blowers
5	**Controls, Accessories & Maintenance:** Expansion devices: capillary tube, thermostatic expansion valve, electronic expansion valve, Controls: pressure controls, thermostats, relays, switches, Accessories: receivers, accumulators, filters, dryers, Fault diagnosis, maintenance practices, leak detection, charging & servicing
5	**Advanced Systems & Trends:** Vapor absorption refrigeration (VAR) systems, Solar and eco-friendly refrigeration, Refrigeration for cold storage & ice plants, Green refrigeration technologies, alternative refrigerants, Trends in air conditioning: VRV/VRF, inverter ACs, smart AC systems

LIST OF EXPERIMENTS

1. To study and perform experiment on basic vapour compression refrigeration cycle.
2. To find C.O.P. of water cooler.
3. To study and perform experiment on vapour absorption apparatus.
4. To find the performance parameter of cooling tower.
5. To study various components in room air conditioner.
6. To find RH of atmospheric air by using Sling Psychrometer.
7. To study different control devices of a refrigeration system.
8. To find the performance of a refrigeration test rig system by using different expansion devices.

REFERENCE BOOK'S

1 Refrigeration and Air Conditioning R. K. Rajput S. Chand & Company Pvt. Ltd., Latest Edition
2 Refrigeration and Air Conditioning P. L. Ballaney Khanna Publishers, Latest Edition
3 Refrigeration and Air Conditioning Arora & Domkundwar Dhanpat Rai & Co., Latest Edition
4 A Course in Refrigeration and Air Conditioning S. C. Arora Dhanpat Rai & Sons, Latest Edition
5 Refrigeration and Air Conditioning C. P. Arora Dhanpat Rai & Sons
6 Principles of Refrigeration Roy J. Dossat Pearson India, Latest Edition
7Refrigeration and Air Conditioning S. K. Hajra Choudhury Media Promoters & Publishers Pvt. Ltd.
8 Modern Refrigeration and Air Conditioning Althouse, Turnquist & Bracciano Tata McGraw-Hill Education
9 Fundamentals of Refrigeration and Air Conditioning Ananthanarayanan PHI Learning Pvt. Ltd.

DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER: SIXTH SEMESTER

NAME OF THE COURSE: Power Plant Engineering

PAPERCODE: DIP- 603 B

RATIONAL

Power Plant engineering as a Course provides a simple understanding of the power plant working, construction, maintenance, and other related engineering issues. The course contains the details of steam and gas thermal power plants, hydro power plants, nuclear power plants, along with solar, wind and geothermal energy power systems in addition to the direct energy conversion and the economics of power generation and the environmental aspect.

CO's of Power Plant Engineering

CO1: Understand the principles, types, and components of various power plants including thermal, hydro, nuclear, and renewable energy systems.
CO2: Explain the working of thermal power plants, including Rankine cycle, boilers, turbines, condensers, and auxiliary systems.
CO3: Describe the layout, working, and components of hydroelectric and pumped storage power plants, including turbine selection and performance.
CO4: Understand the basic principles, components, and safety considerations of nuclear power plants and nuclear waste management.
CO5: Identify renewable energy sources, their technologies, applications, and integration into power generation systems.
CO6: Analyze economic, environmental, and management aspects of power plants, including cost analysis, load forecasting, reliability, and regulations.

DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER: SIXTH SEMESTER

NAME OF THE COURSE: Power Plant Engineering

PAPERCODE: DIP- 603 B

Unit No.	**COURSE CONTENT**
1	**Introduction to Power Plants:** - Overview of power generation methods: thermal, hydro, nuclear, and renewable- Selection criteria for power plant sites- Layout and components of thermal and hydroelectric power plants- Environmental considerations and regulations.
2	**Thermal Power Plants:** - Working principle and components of thermal power plants- Rankine cycle and its modifications- Boiler types and performance parameters- Steam turbines and condensers- Feedwater heaters and economizers- Cooling towers and heat exchangers- Performance analysis and efficiency calculations
3	**Hydroelectric Power Plants :** - Hydrological cycle and water resources- Components of hydroelectric power plants: dam, reservoir, penstock, turbine, and generator- Types of turbines: Pelton, Francis, Kaplan- Plant layout and operation- Pumped storage systems- Environmental and ecological impacts
4	**Nuclear Power Plants :**- Basic principles of nuclear fission- Components of nuclear power plants: reactor, moderator, coolant, control rods- Types of reactors: PWR, BWR, PHWR- Radiation shielding and safety measures- Nuclear waste management- Environmental and safety considerations
5	**Renewable Energy Sources :**- Solar energy: photovoltaic and thermal systems- Wind energy: wind turbines and site selection- Biomass energy: conversion technologies- Geothermal energy: plant types and applications- Ocean energy: tidal and wave energy systems- Integration of renewable sources into the grid
6	**Power Plant Economics and Management: -** Cost analysis: capital, operational, and maintenance costs- Economic dispatch and load forecasting- Reliability and availability analysis- Power purchase agreements and tariffs- Environmental impact assessment- Regulatory frameworks and policies.

LIST of Experiment

1 To study of modern steam power plant.
2 To Study about the Various Types of Fuel & Ash Handling Systems.
3 To study about different types of dust collectors and pulverized fuel burners.
4 To study about nuclear power plant.
5 To study of different types of steam turbines.
6 To study about different types of condensers and cooling towers.
7 To study about economics of power generation systems.
8 To study of gas power plant.
9 To study of combined steam & gas turbine power plant.
10 Testing of diesel fired water tube boiler based steam power plant.

REFERENCE BOOKS

1 Power Plant Engineering P. K. Nag Tata McGraw Hill, Latest Edition
2 A Course in Power Plant Engineering Arora & Domkundwar Dhanpat Rai & Co., Latest Edition
3 Power Plant Engineering R. K. RajputS. Chand & Company Pvt. Ltd., Latest Edition
4 Power Plant Engineering V. P. Vasandani Khanna Publishers, Latest Edition
5 Modern Power Plant Engineering Thomas C. Elliott RC Press / Elsevier
6 Power Plant Engineering: Conventional & Renewable P. Chattopadhyay PHI Learning Pvt. Ltd., Latest Edition
7 Power Plant Engineering G. D. Rai Khanna Publishers, Latest Edition
8 Fundamentals of Power Plant Engineering K. K. Ramalingam Standard Publishers, India
9 Thermal Power Plants: Design & Operation R. Yadav CBS Publishers & Distributors, India
10 Power Plant Engineering Lab Manual Dr. S. K. Bhatia Standard Publishers, India