CURRICULUM AND SCHEME OF EXAMINATION
DIPLOMA IN AUTOMOBILE ENGINEERING
III TERM

Code No	Course Name	Hrs / Week	Credit	Scheme of Examination Allocation marks			Duration of exam
				Internal	External	Total	
8201	Mechanics of Materials *	6	6	25	75	100	3
8202	Manufacturing Processes *	5	5	25	75	100	3
8203	Fluid Mechanics & Fluid Power *	6	6	25	75	100	3
8204	Machine Drawing *	6	4	25	75	100	3
8205	Mechanics of Materials & Fluid Mechanics Lab *	6	3	25	75	100	3
8206	Workshop - I (Foundry, Welding & Smithy)*	6	3	25	75	100	3
	Total	35	27	150	450	600	18

* Common with Diploma in Mechanical Engineering

IV TERM

Code No	Course Name	Hrs / Week	Credit	Scheme of Examination Allocation marks			Duration of exam
				Internal	External	Total	
8207	Applied Thermo Dynamics *	7	7	25	75	100	3
8208	Machine Shop Technology *	7	7	25	75	100	
8209	Electrical & Electronics Engineering *	6	6	25	75	100	3
8210	Auto CAD Lab *	6	3	25	75	100	3
8211	Electrical & Electronics Engineering Lab *	3	1.5	25	75	100	3
8212	Workshop - II (Lathe & Metrology) *	6	3	25	75	100	3
	Total	35	27.5	150	450	600	18

* Common with Diploma in Mechanical Engineering

8207 APPLIED THERMODYNAMICS

IV TERM (Core Course)

7 Hours / Week Total Hours: 84 Hours

MAJOR DIVISIONS:

UNIT I	Thermodynamics and Expansion of gases
UNIT II	Steady flow energy equation and Air cycles
UNIT III	Internal combustion engines
UNIT IV	Fuels and Performance of I.C engine
UNIT V	Air compressors and Gas turbines

UNIT I: THERMODYNAMICS AND EXPANSION OF GASES (17 Hrs)

Introduction - definitions and units of mass, weight, volume, density, specific weight and specific gravity - pressure - units - atmospheric, gauge, vacuum and absolute pressure - temperature- Celsius and absolute temperature - S.T.P and N.T.P conditions - heat - specific heat capacity at constant volume and at constant pressure - work - power - energy - types - thermodynamic system - types - properties and state of system - intensive and extensive properties - thermodynamic process - cycle - point and path functions - law of conservation of energy - equilibrium - thermodynamic equilibrium - zeroth , first and second laws of thermodynamics - problems

Perfect gases - laws of perfect gases - Boyle's, Charles' , Joule's, Regnault's and Avagadro's laws - characteristic gas equation - relation between specific heats and gas constant - universal gas constant - problems - enthalpy - change in enthalpy - entropy - change in entropy - general equations for change in entropy.

Expansion of gases - thermodynamic processes - constant volume, constant pressure, isothermal (hyperbolic), isentropic (reversible adiabatic) , polytropic, free expansion and throttling processes - p-V and T-s diagrams, work done , change in internal energy , heat transfer, change in enthalpy, change in entropy for various processes - problems.

UNIT II: STEADY FLOW ENERGY EQUATION AND AIR CYCLES (20 Hrs)

Steady flow system - control volume - steady flow energy equation - applications - steam boiler - condenser - nozzles - steam and gas turbines - reciprocating and rotary compressors - non flow energy equation - problems.

Air cycles - air standard efficiency - reversible and irreversible processes - thermodynamic reversibility - conditions of reversibility - assumptions in deriving air standard efficiency - Carnot cycle - Otto cycle - Joule cycle - Diesel cycle - comparison of Otto cycle and Diesel cycle - ideal

and actual p-V diagrams of Otto and Diesel cycles - comparison - problems - dual combustion cycle (description only).

UNIT -III: INTERNAL COMBUSTION ENGINES (17 Hrs)

Introduction - classifications - four stroke cycle petrol and diesel engines - merits and demerits - two stroke cycle petrol and diesel engines - comparison - constructional details of I.C. engine - components of engine - cylinder block, crank-case, cylinder head, liners, oil pan, piston, piston rings, connecting rod, crank shaft, cam shaft, valve and valve train - materials and manufacturing methods - valve timing diagram for four stroke petrol and diesel engines - port timing diagram for two stroke petrol and diesel engines.

Layout of fuel supply system in petrol engines -A.C. mechanical fuel pump - simple carburetor - Solex carburetor - layout of fuel supply system in diesel engine- single acting fuel feed pump - CAV fuel injection pump - fuel injectors - types of nozzles - fuel filters.

Ignition systems - compression and spark ignition - coil, magneto and electronic ignition systems - governing of I.C. engines - quantity and quality governing - cooling systems - air cooling - water cooling - merits and demerits.

Lubrication - purpose - properties of lubricants -types of lubrication systems - oil pump and oil filters - scavenging - super charging - effects and applications - turbo charger.

UNIT IV: FUELS & PERFORMANCE OF I.C ENGINES (15 Hrs)

Fuels - classifications - merits and demerits - requirements of a good fuel - combustion of fuels - stoichiometric air required for complete combustion of fuels - excess air - products of combustion - problems - calorific value of fuels - higher and lower calorific values - Dulong's formula - problems - determination of calorific value - Bomb and Junker's calorimeter - problems -Orsat apparatus for flue gas analysis - air pollution - effects and control of pollution

Performance of I.C engines - Testing - thermodynamic and commercial tests - indicated power - brake power - friction power - efficiencies of I.C. engines - indicated thermal ,brake thermal, mechanical and relative efficiencies - Morse test - procedure - problems - heat balance sheet - problems.

UNIT V: AIR COMPRESSORS AND GAS TURBINES (15 Hrs)

Air compressors - uses of compressed air - classifications of compressor - working principle of a compressor - single stage reciprocating compressor - compression processes - power required to drive the compressor - problems - clearance volume and its effects - volumetric efficiency - power required to drive the compressor with clearance volume - problems - multi stage air compressor -merits and demerits - intercooler - perfect inter cooling - work input on multi stage compressor - condition for minimum work input in multi stage compressor with perfect inter cooling - ratio of cylinder diameters for minimum work input - problems - rotary compressors - Roots, vane blowers - centrifugal and axial flow air compressors.

Gas turbines - classifications - advantages and disadvantages of gas turbines - constant

pressure gas turbine - gas turbine with regenerator - intercooler - reheater - effects - closed cycle gas turbines - merits and demerits of open and closed cycle gas turbines - turbojet engines - merits and demerits - turbo propeller engines - merits and demerits - ramjet- comparison of air-craft and industrial gas turbines.

REFERENCE BOOKS:

1. Sarkar.B.K, "Thermal Engineering", TMH, 2002.
2. Khurmi.R.S, "TextBook ofThermal Engineering" S.Chand & Company Ltd, New Delhi, 2002.
3. Ballaney.P.L, "Thermal Engineering" Khanna Publishers, 2003.

4. Domkundwar, “Course in Thermodynamics and Heat Engines (Thermal Engineering)”, 2004.
5. Nag PK, “Basic and Applied Thermodnamics”, Tata McGraw Hill Pub Co., Ltd., Sydney, 2004.

8207 APPLIED THERMODYNAMICS

Model Question Paper

Time : 3 Hrs Max.Marks : 75

NOTE : 1. Answer all questions . Choosing any one from Part - A (5marks) and any one from Part - B (10marks)
2. All Questions carry equal marks.

I. A. i) Explain Kelvin -Plank statement of second law of Thermodynamics.
ii) Derive the P-V-T relations of an adiabatic process.

B. i) 0.25kg of air at a pressure of 1bar occupies a volume of $0.3m^3$. If this air expands isothermally to a volume of $0.9m^3$ determine (i) The initial temperature (ii) Final temp (iii) external workdone (iv)the heat transfer (v)entropy. Assume R = 0.29 kJ/kg/ °k.

ii) Gas expands according to the law $PV^{1.3} = C$, from a pressure of 900 KN/m^2 and volume of $0.0025m^3$ to a pressure of $100KN/m^2$. How much heat would have been received (or) rejected during this process. Also determine the polytropic specific heat. Take g = 1.4 and $C_V = 0.718$ kJ/ kg/ °k.

II A. i) Write down and explain the Steady flow energy equation.
ii) Draw the P-V diagram and T-s diagram of Carnot cycle and mention various process.

B i) An ideal hot air engine working on Carnot cycle between 100 °C to 1000 °C. Find the thermal efficiency of the engine. If the engine is supplied with 7200 kJ/min of heat energy , find the workdone by the engine and also power developed by the engine.

ii) In an ideal diesel cycle the compression ratio is 15: 1 and expansion ratio is 7.5:1. The Pressure and the temperature at the beginning of compression are 98 KN/m^2 and 44 °C respectively and the pressure at the end of expansion is 258.6 KN/m^2. Determine (i) the maximum temp of the cycle (ii) and thermal efficiency of the cycle .Take g = 1.4

III A i) What are the two types of piston rings and state its functions.
ii) Compare water cooled engine with air cooled engine.

B i) Explain the typical piston and connecting rod assembly of an I.C. Engine with neat sketch.

ii) Write the construction and working of CAV - Fuel Injection pump with neat sketch.

IV A i) Write the requirements of good fuel material

ii) Define IP, BP & FP.

B i) Explain the working of Orsat apparatus for flue gas analysis

ii) A gas engine working on the constant volume cycle has a swept volume of 0.0008 m^3 and a clearance volume 0.00015m^3. The engine uses 0.85m^3 of gas/min of calorific value 18 MJ/m^3 developing an indicated power of 81.5KW. Find the efficiency of the engine relative to the air standard efficiency. Take g = 1.4

V A i) Write the merits and demerits of the Multi stage air compressor

ii) Compare the Air craft gas turbine with Industrial gas turbine.

B i) A single cylinder reciprocating air compressor has a displacement of 0.15m^3. The suction condition of the air is 1 bar and 15° C the air after compression to 8 bar is delivered to a receiver at constant Pressure. The compression follows the adiabatic and g = 1.4. Determine

(a) the temp. at the end of compression
(b) workdone by air during suction,
(c) workdone during compression.
(d) workdone during delivery
(e) Network done on air per cycle,

Take R= 0.287 kJ/ kg/ °k.

ii) Explain with neat sketch the working of Turbojet Engine. What are the advantages of Turbojet Engine?.

8208 MACHINE SHOP TECHNOLOGY

IV TERM (Core Course)

7 Hours / Week Total Hours: 84 Hours

MAJOR DIVISIONS

UNIT I	Planer, Shaper and Slotter
UNIT II	Drilling machines and Milling machines
UNIT III	Grinding, Broaching, Boring and Jig boring
UNIT IV	Gear manufacturing practice - Forming and Generating processes
UNIT V	Semi automatic lathes, Automatic lathes, Jigs & Fixtures

UNIT - I (18 Hrs)

PLANER:

Types of planers - description of double housing planer - specifications - principles of operation - drives - quick return mechanism - feed mechanism - types, work holding devices and special fixtures - types of tools - various operations.

SHAPER:

Types of shapers - specifications - standard - plain - universal -principles of operation - drives - quick return mechanism - crank and slotted link - feed mechanism- work holding devices - tools and fixtures

SLOTTER:

Types of slotters - specifications - method of operation - Whitworth quick return mechanism - feed mechanism - work holding devices - types of tools.

UNIT - II (18 Hrs)

DRILLING MACHINES:

Drills - flat drills - twist drills - nomenclature - types of drilling machines - bench type - floor type - radial type -gang drill - multispindle type - principle of operation in drilling - speeds and feeds for various materials - drilling holes - methods of holding drill bit - drill chucks - socket and sleeve - drilling - reaming - counter sinking - counter boring - spot facing - tapping - deep hole drill - drill jigs.

MILLING MACHINES:

Types - column and knee type - plain - universal milling machine - vertical milling machine - specification of milling machines - principles of operation - work and tool holding

devices - arbor - stub arbor - spring collets - adaptors - milling cutters - plain milling cutter - slab milling cutter - slitting saw - side milling cutter - angle milling cutter - T-slot milling cutter - woodruff milling cutter - fly cutter - nomenclature of milling cutter - milling process - conventional milling - climb milling - milling operations - straddle milling - gang milling - vertical milling attachment - types of milling fixtures.

UNIT - III (18 Hrs)

GRINDING MACHINES :

Types and classification - specifications - rough grinders - floor mounted hand grinders - portable grinders - belt grinders- precision grinders - cylindrical, surface, centreless grinders - internal grinders - planetary grinders - principles of operations - grinding wheels - abrasives - natural and artificial - dressing and truing of wheels - balancing of grinding wheels - diamond wheels - types of bonds - grit, grade and structure of wheels - wheel shapes and sizes - standard marking systems of grinding wheels - selection of grinding wheel - mounting of grinding wheels.

BROACHING :

Types of broaching machine - horizontal, vertical and continuous broaching - principles of operation - types of broaches - classification - broach tool nomenclature - broaching operations - simple examples.

BORING AND JIG BORING :

Boring machines - horizontal and vertical types - fine boring machine - boring tools - jig boring machine - measuring system - hole location procedure - deep hole boring.

UNIT - IV (15 Hrs)

GEAR MANUFACTURING PRACTICE - FORMING AND GENERATING PROCESSES

Gear forming process in milling - dividing head - principles of operation - indexing - linear indexing - rapid, simple - differential and angular indexing - problems - gear milling - cutter selection - nomenclature - module - pressure angle - milling procedure for spur, helical and bevel gears - problems - other forming processes for manufacture of gears .

Generating process - gear shaper - gear hobbing - principle of operation only - gear finishing processes - burnishing - shaving - grinding and lapping - gear materials - cast iron, steel, alloy steels, brass, bronze, aluminum, nylon, fibre - no problems.

UNIT - V (15 Hrs)

SEMI AUTOMATIC LATHES:

Types of semi automatic lathes - capstan and turret lathes - difference between turret and capstan - tools and work holding devices - self opening die head - collapsible taps - simple tool layout - process sheet.

AUTOMATIC LATHES:

Automatic lathe - classification of single spindle automatic lathe - principle of automatic lathes - automatic screw cutting machines - multi spindle automatic lathes - use of cams in automats.

JIGS AND FIXTURES:

Definitions and concept of Jig and fixture - Advantages of jigs and fixtures - elements of jigs and fixtures - locating devices - 'V' locators - fixed stop locators - adjustable stop locators - clamping devices - strap clamp, screw clamp- cam action clamp- types of jigs - box drill jig - indexing drill jig - types of fixtures - keyway milling fixture - string milling fixture.

REFERENCE BOOKS:

1. HMT, "Production Technology" Tata Mcgraw Hill, 2001.
2. Jain .A.K, "Production Technology" Khanna Publishers, 1999.
3. TTTI, "Production Processes" TTTI, 1982.
4. Hajra Chowdry S.K., "Elements of Workshop Technology Volume I" Media Promoters, Mumbai, 1982.
5. Hajra Chowdry.S.K, "Elements of Workshop Technology: Machine Tools, Volume 2", Media Promoters, Mumbai, 2005.
6. Chapman.W.A.J, "Workshop Technology: Part 1:Introductory Course " Viva Book (P) Ltd, New Delhi, 1998.
7. Chapman. W.A.J, "Workshop Technology : Part 2" Viva Book (P) Ltd, 2000.
8. Chapman. W.A.J, "Workshop Technology : Part 3" Viva Book (P) Ltd, 1998.

9. Lindberg,"Process and Materials of Manufacture", Prentice Hall of India, 1999.

10. R.J.Santhakumar, "Production Technology", Anuradha Agencies, 1998.

11. P.N.Rao, "Manufacturing Technology", Tata McGraw Hill, 1998.

12. R.B.Gupta & B.K.Gupta, "Manufacturing Process", Khanna Publishers, 1998.

13. Mikell.P.Groover, "Fundamentals of Modern Manufacturing", John Wiley & Sons, 2004.

8208 MACHINE SHOP TECHNOLOGY
Model Question Paper

Time : 3 Hrs Max.Marks : 75

NOTE : 1. Answer all questions . Choosing any one from Part - A (5marks) And one from Part - B (10marks)
ii) All Questions carry equal marks

I A i) Write the specifications of a planer.
ii) How do you classify different types of shapers?

B i) Explain the working principle of a quick return mechanism of a planer by open and cross belt drive with a neat sketch.
ii) Draw a neat sketch of a slotter and explain its working.

II. A.i) Describe the uses of anyone of the tool holding devices used in a drilling machine.
ii) With a simple sketch , describe the operation of Straddle milling process done on a milling machine.

B.i) Describe the following drilling machine operations
ii) Counter boring b) Spot facing C) Tapping
ii) Describe the construction and working of a vertical milling machine.

III A i) How the dressing of grinding wheel is done? Explain it.
ii) Write short notes on broaching operation.

B i) With a neat sketch describe the nomenclature of a broach.
ii) Draw a block diagram of jig boring machine and explain its salient features.

IV A i) What is gear hobbing? Explain it.
ii) List out the various methods used in gear finishing processes.

B i) With the simple sketch explain the working of a simple dividing head.
ii) Describe the gear generation by a gear shaping method with the suitable sketch.

V A i) List out the differences between Capstan and Turret lathe
ii) State the advantages of a jig and Fixture.
B.i) Assuming the suitable components, prepare a tool layout on a capstan Lathe.
ii) What is a Drill Jig? Describe any one type of drill Jig.

8209 ELECTRICAL & ELECTRONICS ENGINEERING

IV TERM (Core Course)

6 Hours/ Week Total Hours: 72 Hrs

MAJOR DIVISIONS

UNIT I	DC circuits, Magnetism and Instruments
UNIT II	AC fundamentals and transformer
UNIT III	DC and AC Machines
UNIT IV	Basic Electronics
UNIT V	Logic Gates and PLC

UNIT I- DC CIRCUITS, MAGNETISM AND INSTRUMENTS (15 Hrs)

Definitions - Electric current, voltage and resistance- Ohm's Law and Kirchoff's Laws - Resistance in series, parallel and series parallel - Simple problems - Electromagnetism(Definitions only), Magnetic flux, Flux density, Magnetic field Intensity, MMF, permeability, reluctance, Faraday's laws of electro magnetic Induction - Instruments - Construction and working principle only moving of Iron(Attraction, Repulsion)meter, PMMC meter, dynamometer wattmeter, induction type single phase energy meter.

UNIT II- AC FUNDAMENTALS AND TRANSFORMER (14 Hrs)

Fundamentals of AC voltage and current- Peak, average, RMS value of sine wave, Frequency, time period, amplitude, power, power factor (Definition only) - Concept of inductive and capacitive reactance and impedance - Series RLC circuit only - Simple problems - 3 phase system - relation between line and phase values in star and delta systems (no derivations) - simple problems- two wattmeter method of measuring power in 3 phase circuits.

TRANSFORMER

Principle of operation and construction of transformer, EMF equation, Losses in a transformer - Efficiency, autotransformer

UNIT III- DC AND AC MACHINES (14 Hrs)

Principle and construction of DC motor, types of DC motors - Applications - Principle of operation of single phase capacitor start induction motor - Three phase Induction motors - Squirrel cage and slip ring IM (construction and working principle only) - Servo motors & Stepper motors - types - applications. Selection of motors for Mechanical applications DOL starter, Star delta Starter

DC GENERATORS

working principle - construction - EMF equations (qualitative treatment only) - types.

ALTERNATORS

Basic principle - generation of EMF (1f &3f)- rotating field system - advantages - types of rotors - construction of alternator - relation between frequency, speed and number of poles (qualitative treatment only).

UNIT IV- BASIC ELECTRONICS (14 Hrs)

Semiconductor materials -N type and P type - PN junction , Forward and reverse bias, characteristics on PN diode- Half wave rectifier, full wave rectifier, bridge rectifier, zener and avalanche break down, characteristics of zener diode- application of zener diode.

TRANSISTORS (Qualitative treatment only)

Transistor - construction of NPN and PNP types- Basic bias requirements (Common Emitter configuration only) photo conductive cells (LDR), light emitting diode (LED), liquid crystal display (LCD) (Dynamic Scattering Type only)

Thyristors - Principle and working of SCR - characteristics – applications-.Introduction to Integrated circuits -Classification and packages only.

UNIT V- LOGIC GATES AND PLC (15 Hrs)

Stepper motor - construction and working principle - applications of stepper motor. Positive and negative logic, definition, symbol, truth table, Boolean expression for OR, AND, NOT, NOR, NAND, EXOR and EXNOR gates.

PROGRAMMABLE LOGIC CONTROLLERS

PLC definition- features and benefits of PLC - Systems and its elements - input and output elements - PLC memory system - PLC circuit verses hard wired circuits - sensors - types of sensors - limit switch, reed switch, photo electric sensor, inductive proximity sensor - types of contacts normally open (NO) contact, normally closed (NC) contact -, ladder logic symbol - AND logic, OR logic, and NOT logic - truth table - steps involved in application circuits using a PLC - PLC scan input , programme scan and output scan.

REFERENCES:

1. Theraja.B.L, “Fundamentals of Electrical Engineering and Electronics” S.Chand &
Company, 2001.
2. Thyagarajan.T, “Fundamentals of Electrical Engineering and Electronics” Scitech Publications Pvt Ltd, 3rd Eition.
3. Mikell.P.Groover, “Automation Production Systems and Computer Integrated Manufacturing” Prentice Hall of India Pvt Ltd, 1973.
4. Raina .K.B & Battachariya.S.K, “Electrical Design Estimating and Costing” New Age International Ltd, 2003

8209 ELECTRICAL AND ELECTRONICS ENGINEERING

Model Question Paper

Time:3 Hrs Max marks:75

NOTE : 1. Answer all questions . Choosing any one from Part - A (5marks) and one from Part - B (10marks)
2. All Questions carry equal marks.

I A i) Define electric current and voltage.
ii) Find the equivalent resistance when two resistors are connected in parallel.

B i) Explain kirchoff”s current and voltage law.
ii) Explain the construction and working of PMMC instrument.

II A i) Define frequency,period and amplitude.
ii) An RLC circuit consists of a resistance value of 100 ohms, a inductor of 0.1 mH and a capacitor of 10 microfarad, calculate
a) impedence b) capacitive reactance and c) Inductive reactance.

B i) Explain the measurement of three phase power using two wattmeter method
ii) Explain the construction and principle of operation of a transformer.

III A i) Write down the applications of DC motor.
ii) State the principle on which the DC generator is working.

B i) Explain the principle of operation of single phase capacitor start induction Motor.

ii) Explain the principle and construction of an alternator.

IV A i) Explain the PN junction diode during forward bias.

ii) Explain the LDR in dynamic scattering mode.

B i) Explain the construction and operation of SCR.
ii) Explain with neat circuit diagram,waveform the working of bridge rectifier with and without filter.

V A i) Explain positive and negative logic.
ii) What are the benefits of PLC.

B i) Explain the construction of stepper motor with neat diagram.
ii) Explain the system layout of PLC.

8210 AUTOCAD LAB

IV TERM (Core Course)

6 Hours / Week Total Hours : 72 Hrs

Introduction – History of AutoCAD – Applications – Advantages over manual drafting – Hardware requirements – Software requirements – windows desktop – AutoCAD screen interface – menus – toolbars – How to start Autocad – command groups – How to execute command – types of coordinate systems – absolute – relative – polar.

Creating objects (2D) – using draw commands – Line, Arc, Circle , Ellipse, Donut, Polygon, Point, Pline, Sketch, Trace – Creating 2D solid.

Creating Text – dtext, mtext, text style-Mline, Spline – Drawing with precision – Osnap options – drafting setting – Limits – Units – drawing aids – Fill, Snap, Grid, Ortholines – Function keys.

Editing and modify commands - object selection methods – erasing object – oops – canceling and undoing a command – copy – move – array – offset – scale – rotate – mirror – break – trim – extend – explode.

Divide – measure – stretech – lengthen – changing properties – color – line types – Ltscale – Matching properties – editing with grips – Pedit – ddedit – mledit.

Controlling the drawing display – blipmode – view group commands – zoom redraw, regen, regen auto, pan, viewers, real time zoom.

Inquiry groups – calculating area – distance – time – status of drawing – using calculator – Creating of blocks – Wblock – inserting a block – block attributes – hatchng – pattern types – boundary hatch – working with layers.

Basic dimensioning – editing dimensions – dimension styles – dimensioning system variables.

Technical drawing with AutoCAD – Detailed drawing, Assembly drawing, sectional views, Bill of materials – creating prototype drawing.

Isometric drawing – Isometric projection – Drawing iso circles – Dimensioning Isometric objects.

File commands – file import and export – plotting drawing – external references – 3D fundamentals – 2D to 3D conversion.

Drawing Exercise Practice I

1. AutoCAD commands practice
2. Simple 2D drawing
3. Isometric drawing
4. 3D drawing - Model 1
5. 3D drawing - Model 2

Drawing Exercise Practice II

Machine and Assembly drawing (in 2D only) of

1. Sleeve and cotter joint
2. Socket and Spigot Joint
3. Gib and Cotter Joint
4. Flange Coupling
5. Universal Coupling
6. Machine Vice
7. Swivel Bearing
8. Screw Jack
9. Tail Stock.

SCHEME OF EXAMINATION

S.No	Topic	Marks
1	Objective types question (20 Fill in the blanks)	20
2	Isometric drawing creation (Drawing 10, Dimensions 5)	15
3	M/c Drawing construction (Drawing 20, Assembly 5 Sectioning & Dimensions 10)	35
4	Viva Voce	5
	Total	75

8211 ELECTRICAL & ELECTRONICS ENGINEERING LAB

IV TERM (Core Course)

3 Hours/ Week Total Hours: 36 Hrs

LIST OF EXPERIMENTS

1. Measurement of unknown resistance using ohm's law.
2. a) Measurement of power in single-phase circuit by ammeter and watt meter methods.
   b) Measurement of voltage current and resistance by using multimeter (Both analog and digital) in all the ranges.
3. Open and short circuit test on a single phase transformer to find the losses and Efficiency.
4. a) Make a connection for shorting a single-phase induction motor by DOL starter and a 3- phase motor by using star delta starter.
   b) Study of starters 3 point DOL and star delta starter.
5. Load test on DC shunt motor to find the efficiency.
6. Load test on 3phase-induction motor at various loads to find the efficiency.
7. a) VI characteristics of PN junction diode.
   b) VI characteristics of a SCR
8. a) Construction of a half wave rectifier with out filter
   b) Construction of a bridge rectifier with out filter.
9. Verification of truth table for AND ,OR, NOT, NAND, NOR, EXOR,and EXNOR Gates.
10. Study of PLC systems. (Not for Examination)

S.n	Topic	Marks
1	Exercises (Any one from Electrical or Electronics lab)	70
2	Viva voce	5
	Total	75

SCHEME OF EXAMINATION

8212 WORK SHOP – II
IV TERM (Core Course)

6 Hours / Week Total Hours : 72 Hrs

LATHE & METROLOGY

I – LATHE WORK

1. Introduction of safety in operating machines
2. Introduction to lathe and its parts
3. Introduction to work holding devices and tool holding devices
4. Types of tools used in lathe work
5. Types of measuring instruments and their uses.
6. Setting of work and tools
7. Operation of lathe
8. Various operations performed on a lathe

Note : The dimensions may be modified according to the materials available

II - METROLOGY

I. Linear Measurements:

1. Determination of the thickness of ground MS flat to an accuracy of 0.02mm using vernier caliper.
2. Determination of the diameter and length of a turned cylindrical (turned in lathe exercise) to an accuracy of 0.02mm using vernier caliper.
3. Determination of the inside diameter of a bush component to an accuracy off 0.02 using vernier caliper.
4. Determination of diameter of a cylindrical component to an accuracy of 0.01mm using micrometer and check the result with digital micrometer
5. Determination of inside diameter of the bore of a bush cylindrical component to an accuracy of 0.01mm using inside micrometer.
6. Determine the heights of gauge blocks or parallel bars to accuracy of 0.02mm using vernier height gauge and check the result with digital vernier height gauge.

7. Determine the depth of a blind bore component to an accuracy of 0.02mm using vernier depth gauge
8. Determine the thickness of ground MS plates using slip gauges

II. Angular Measurements:

9. Determination of angle of v- blocks, dovetails in mechanical components using universal bevel protractor.
10. Determination of angle of machined surfaces of components using sine bar with slip gauges.
11. Measurement of V-Thread dimensions.
12. Measurement of Spur gear tooth dimensions.

III. Comparison of Dimension:

13. Checking the dimension of a machined component with standard dimensioned component using mechanical Comparators.(both internal and external dimension).
14. Checking the dimensions of a machined component with standard dimension using pneumatic comparators.(both internal and external dimension).

SCHEME OF EXAMINATION

S.no	Topic	Marks
1	Lathe Work	50
2	Metrology	20
3	Viva – Voice	5
	Total	75