GIACR DIPLOMA (RAYAGADA)

MECHANICAL BRANCH

SUB-STRENGTH OF MATERIAL (3RD SEM) FACULTY NAME-MANORANJAN BEHERA

LE NO	TOPICS COVERED	OF
1.0	**Simple Stress and Strain**	**10**
1.1	Types of load, stresses & strains,(Axial and tangential) Hooke's law, Young's modulus, bulk modulus, modulus of rigidity, Poisson's ratio, derive the relation between three elastic constants,	2
1.2	Principle of super position, stresses in composite section	2
1.3	Temperature stress, determine the temperature stress in composite bar (single core)	2
1.4	Strain energy and resilience, Stress due to gradually applied, suddenly applied and Impact load	2
1.5	Simple problems on above	2
2.0	**Thin cylinder and spherical shell under internal pressure**	**8**
2.1	Definition of hoop and longitudinal stress, strain	2
2.2	Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain	2
2.3	Computation of the change in length, diameter and volume	2
2.4	Simple problems on above	2
3.0	**Two dimensional stress systems**	**10**
3.1	Determination of normal stress, shear stress and resultant stress on oblique plane	3
3.2	Location of principal plane and computation of principal stress	4
3.3	Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle	3
4.0	**Bending moment& shear force**	**10**
4.1	Types of beam and load	3
4.2	Concepts of Shear force and bending moment	3
4.3	Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and over hanging beam under point load and uniformly distributed load	4
5.0	**Theory of simple bending**	**10**
5.1	Assumptions in the theory of bending,	3
5.2	Bending equation, Moment of resistance, Section modulus& neutral axis.	3
5.3	Solve simple problems.	4
6.0	**Combined direct & bending stresses**	**6**
6.1	Define column	2
6.2	Axial load, Eccentric load on column,	1
6.3	Direct stresses, Bending stresses, Maximum& Minimum stresses. Numerical problems on above.	1
6.4	Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions	2
7.0	**Torsion**	**6**
7.1	Assumption of pure torsion	2
7.2	The torsion equation for solid and hollow circular shaft	2
7.3	Comparison between solid and hollow shaft subjected to pure torsion	2

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SUB-PRODUCTION TECHYNOLOGY (3RD SEM) FACULTY NAME-MANAS RANJAN SAHU

MODULE. NO	TOPIC COVERED	NO OF PERIODS
1.0	**Metal Forming Processes**	**7**
1.1	Extrusion: Definition & Classification	1
1.2	Explain direct, indirect and impact extrusion process	2
1.3	*Define rolling. Classify it*	2
1.4	Differentiate between cold rolling and hot rolling process	1
1.5	List the different types of rolling mills used in Rolling process	1
2.0	**Welding**	**16**
2.1	Define welding and classify various welding processes.	2
2.2	Explain fluxes used in welding.	2
2.3	Explain Oxy-acetylene welding process.	2
2.4	Explain various types of flames used in Oxy-acetylene welding process	2
2.5	Explain Arc welding process.	2
2.6	Specify arc welding electrodes.	1
2.7	Define resistance welding and classify it.	1
2.8	Describe various resistance welding processes such as butt welding, spot welding, flash welding, projection welding and seam welding	1
2.9	Explain TIG and MIG welding process	1
2.10	State different welding defects with causes and remedies	2
3.0	**Casting**	**16**
3.1	Define Casting and Classify the various Casting processes.	2
3.2	Explain the procedure of Sand mould casting.	2
3.3	Explain different types of molding sands with their composition and properties.	2
3.4	Classify different pattern and state various pattern allowances	2
3.5	Classify core	2
3.6	Describe construction and working of cupola and crucible furnace.	2
3.7	Explain die casting method.	2
3.8	Explain centrifugal casting such as true centrifugal casting, centrifuging with advantages, limitation and area of application.	1
3.9	Explain various casting defects with their causes and remedies	1
4.0	**Powder Metallurgy**	**7**
4.1	Define powder metallurgy process.	1
4.2	State advantages of powder metallurgy technology technique	2
4.3	Describe the methods of producing components by powder metallurgy technique.	2
4.4	Explain sintering.	1
4.5	Economics of powder metallurgy	1
5.0	**Press Work**	**7**
5.1	Describe Press Works: blanking, piercing and trimming.	2
5.2	List various types of die and punch	2
5.3	Explain simple, Compound & Progressive dies	2
5.4	Describe the various advantages & disadvantages of above dies	1
6.0	**Jigs and Fixtures**	**7**
6.1	Define jigs and fixtures	2
6.2	State advantages of using jigs and fixtures	2
6.3	State the principle of locations	1
6.4	Describe the methods of location with respect to 3-2-1 point location of rectangular jig	1
6.5	List various types of jig and fixtures	1

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SUB-ENGINEERING MATERIALS(3RD SEM) FACULTY NAME-AUROBINDA PANDA

MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS
1.0	**Engineering materials and their properties**	5
1.1	Material classification into ferrous and non ferrous category and alloys	1
1.2	*Properties of Materials: Physical , Chemical and Mechanical*	2
1.3	Performance requirements	1
1.4	Material reliability and safety	1
2.0	**Ferrous Materials and alloys**	5
2.1	Characteristics and application of ferrous materials	1
2.2	Classification, composition and application of low carbon steel, medium carbon steel and High carbon steel	2
2.3	Alloy steel: Low alloy steel, high alloy steel, tool steel and stainless steel	1
2.4	Tool steel: Effect of various alloying elements such as Cr, Mn, Ni, V, Mo	1
3.0	**Iron – Carbon system**	8
3.1	Concept of phase diagram and cooling curves	4
3.2	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel	4
4.0	**Crystal imperfections**	10
4.1	Crystal defines, classification of crystals, ideal crystal and crystal imperfections	2
4.2	Classification of imperfection: Point defects, line defects, surface defects and volume defects	3
4.3	Types and causes of point defects: Vacancies, Interstitials and impurities	1
4.4	Types and causes of line defects: Edge dislocation and screw dislocation	1
4.5	Effect of imperfection on material properties	1
4.6	Deformation by slip and twinning	1
4.7	Effect of deformation on material properties	1
5.0	**Heat Treatment**	10
5.1	Purpose of Heat treatment	2
5.2	Process of heat treatment: Annealing, normalizing, hardening, tampering, stress relieving measures	2
5.3	Surface hardening: Carburizing and Nitriding	2
5.4	Effect of heat treatment on properties of steel	2
5.5	Hardenability of steel	2
6.0	**Non-ferrous alloys**	10
6.1	Aluminum alloys: Composition, property and usage of Duralmin, γ- alloy.	2
6.2	Copper alloys: Composition, property and usage of CopperAluminum, Copper-Tin, Babbit , Phosperous bronze, brass, Copper- Nickel	3
6.3	Predominating elements of lead alloys, Zinc alloys and Nickel alloy	2
6.4	Low alloy materials like P-91, P-22 for power plants and other 10 high temperature services. High alloy materials like stainless steel grades of duplex, super duplex materials .	3
7.0	**Bearing Material**	3
7.1	Classification, composition, properties and uses of Copper base, Tin Base, Lead base, Cadmium base bearing	3
8.0	**Spring Materials**	3
	Classification, composition, properties and uses of Ironbase and Copper base spring materia	3
9.0	**Polymers**	3
9.1	Properties and application of thermosetting and thermoplastic polymers	2
9.2	Properties of elastomers	1
10.0	**Composites and Ceramics**	3
10.1	Classification, composition, properties and uses of particulate based and fiber reinforced composites	2
10.2	Classification and uses of ceramics	1

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SUB-THERMAL ENGG-1(3RD SEM) FACULTY NAME-MALINI JYOTI NEGI

MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS
1.0	**Thermodynamic concept & Terminology**	**12**
1.1	Thermodynamic Systems (closed, open, isolated)	2
1.2	Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement).	2
1.3	Intensive and extensive properties	2
1.4	Define thermodynamic processes, path, cycle , state, path function, point function	1
1.5	Thermodynamic Equilibrium.	1
1.6	Quasi-static Process	1
1.7	Conceptual explanation of energy and its sources	1
1.8	Work , heat and comparison between the two	1
1.9	Mechanical Equivalent of Heat.	1
1.10	Work transfer, Displacement work	1
2.0	**Laws of Thermodynamics**	**12**
2.1	State & explain Zeroth law of thermodynamics.	2
2.2	State & explain First law of thermodynamics.	2
2.3	Limitations of First law of thermodynamics	2
2.4	Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor)	2
2.5	Second law of thermodynamics (Claucius & Kelvin Plank statements).	2
2.6	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P (solve simple numerical)	2
3.0	**Properties Processes of perfect gas**	**10**
3.1	Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law, General gas equation, characteristic gas constant, Universal gas constant	2
3.2	Explain specific heat of gas (Cp and Cv)	2
3.3	Relation between Cp & Cv	1
3.4	Enthalpy of a gas	1
3.5	Work done during a non- flow process	1
3.6	Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytrophic process)	1
3.7	Solve simple problems on above	1
3.8	Free expansion & throttling proces	1
4.0	**Internal combustion engine**	**8**
4.1	Explain & classify I.C engine	2
4.2	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM	2
4.3	Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine	2
4.4	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.	2
5.0	**Gas Power Cycle**	**10**
5.1	Carnot cycle	2
5.2	Otto cycle	2
5.3	Diesel cycle	2
5.4	Dual cycle	2
5.5	Solve simple numerical.	2
6.0	Fuels and Combustion	8
6.1	Define Fuel.	2
6.2	Types of fuel	2
6.3	Application of different types of fuel	1
6.4	Heating values of fuel	1
6.5	Quality of I.C engine fuels Octane number, Cetane number	2

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SUB-EVS(3RD SEM) FACULTY NAME-P.PAVANI

MODULE NO	TOPICS COVERED	NO OF PERIODS
UNIT-1	**The Multidisciplinary nature of environmental studies**	4
	Definition, scope and importance, Need for public awareness	4
UNIT-2	**Natural Resources**	10
	Renewable and non renewable resources:	1
1)	Natural resources and associated problems.	1
b)	Forest resources: Use and over-exploitation, deforestation, case studies, Timber extraction mining, dams and their effects on forests and tribal people	1
c)	Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.	1
d)	Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources	1
e)	Food Resources: World food problems ,changes caused by agriculture and overgrazing,effectsofmodernagriculture,fertilizerspesticidesproblems, water logging, salinity,.	1
f)	Energy Resources: Growing energy need, renewable and nonrenewable energy sources, use of alternate energy sources, case studies.	1
g)	Land Resources: Land as a resource ,land degradation ,man induces landslides, soil erosion, and desertification.	1
2)	Role of individual in conservation of natural resources	1
3)	Equitable use of resources for sustainable lifestyles	1
UNIT-3	**System**	8
1	Concept of an ecosystem.	1
2	Structure and function of an ecosystem	1
3	Producers, consumers, decomposers.	1
4	Energy flow in the ecosystem	1
5	Ecological succession.	1
6	Food chains, food web sand ecological pyramids.	1
7	Introduction, types, characteristic features, structure and function of the following ecosystem:	1
8	Forest ecosystem:	1
9	Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).	1
UNIT-4	**Biodiversity and It's Conservation**	8
1	Introduction-Definition: genetics, species and ecosystem diversity.	2
2	Biogeographically classification of India.	1
3	Value of biodiversity: consumptive use, productive use, social ethical, aesthetic and opt in values	2
4	Biodiversity at global, national and local level.	2
5	Threats to biodiversity: Habitats loss, poaching of wild life, man wildlife conflicts.	1
UNIT-5	**Environmental Pollution.**	12
	Definition Causes, effects and control measures of:	2
	Air pollution. b) Water pollution. c) Soil pollution d) Marine pollution	2
	e) Noise pollution. f) Thermal pollution g) Nuclear hazards.	2
	Solid waste Management: Causes, effects and control measures of urban and industrial wastes.	3
	Role of an individual in prevention of pollution. Disaster management: Floods, earth quake, cyclone and landslides.	3
UNIT -6	**Social Issues and the Environment**	10
	From unsustainable to sustainable development.	2
	Urban problems related to energy	2
	Water conservation, rain water harvesting, water shed management	2
	Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies	2
	Air (prevention and control of pollution) Act. Water (prevention and control of pollution) Act	2
UNIT-7	**Human population and the environment**	8
	Population growth and variation among nations.	2
	Population explosion-family welfare program	2
	Human rights. Value educatioN	2
	Role of information technology in environment and human health.	2

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SUBJECT- FLUID MECHANICS FACULTY-MALINI JYOTI NEGI

MODULE	TOPICS	NO OF PERIODS
1	**Properties of Fluid**	8
1.1	Define fluid	1
1.2	problems.	4
1.3	Definitions and Units of Dynamic viscosity, kinematic viscosity, surface tension Capillary phenomenon	3
2	**Fluid Pressure and its measurements**	8
2.1	Definitions and units of fluid pressure, pressure intensity and pressure head.	2
2.2	Statement of Pascal's Law.	1
2.3	Concept of atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure	2
2.4	Pressure measuring instruments Manometers (Simple and Differential)	1
2.5	Solve simple problems on Manometer.	2
3	**Hydrostatics**	8
3.1	Definition of hydrostatic pressure	2
3.2	Total pressure and centre of pressure on immersed bodies(Horizontal and Vertical Bodies)	1
3.3	Solve Simple problems.	2
3.4	Archimedes 'principle, concept of buoyancy, meta center and meta centric height (Definition only)	1
3.5	Concept of floatation	2
4	**Kinematics of Flow**	8
4.1	Types of fluid flow	2
4.2	Continuity equation(Statement and proof for one dimensional flow)	2
4.3	pitot tube)	2
4.4	Solve simple problems	2
5	**Orifices, notches & weirs**	8
5.1	Define orifice	1
5.2	Flow through orifice	1
5.3	Orifices coefficient & the relation between the orifice coefficients	2
5.4	Classifications of notches & weirs	1
5.5	Discharge over a rectangular notch or weir	1
5.6	Discharge over a triangular notch or weir	1
5.7	Simple problems on above	1
6	**Flow through pipe**	10
6.1	Definition of pipe.	2
6.2	Loss of energy in pipes.	2
6.3	Head loss due to friction: Darcy's and Chezy's formula (Expression only)	2
6.4	Solve Problems using Darcy's and Chezy's formula.	2
6.5	Hydraulic gradient and total gradient line	2
7	**Impact of jets**	10
7.1	Impact of jet on fixed and moving vertical flat plates	2
7.2	Derivation of work done on series of vanes and condition for maximum efficiency.	4
7.3	Impact of jet on moving curved vanes, illustration using velocity triangles, derivation of work done, efficiency.	4

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SUBJECT- THERMAL ENGINEERING-II **FACULTY-MANAS RANJAN SAHU**

MODULE	TOPICS	NO OF PERIODS
1	**Performance of I.C engine**	8
1.1	efficiency Mean effective pressure &specific fuel consumption.	2
1.2	Define air-fuel ratio & calorific value of fuel.	2
1.3	Work out problems to determine efficiencies & specific fuel consumption.	4
2	**Air Compressor**	12
2.1	Explain functions of compressor & industrial use of compressor air	2
2.2	Classify air compressor & principle of operation.	2
2.3	Describe the parts and working principle of reciprocating Air compressor.	2
2.4	&Volumetric efficiency	2
2.5	Derive the work done of single stage & two stage compressor with and without clearance.	2
2.6	Solve simple problems (without clearance only)	2
3	**Properties of Steam**	12
3.1	Difference between gas & vapours.	2
3.2	Formation of steam.	2
3.3	Representation on P-V, T-S, H-S, & T-H diagram.	2
3.4	Definition & Properties of Steam.	2
3.5	Use of steam table & mollier chart for finding unknown properties.	1
3.6	Non flow & flow process of vapour.	1
3.7	P-V, T-S & H-S, diagram.	1
3.8	Determine the changes in properties & solve simple numerical	1
4	**Steam Generator**	12
4.1	Classification & types of Boiler.	2
4.2	Important terms for Boiler.	2
4.3	Comparison between fire tube & Water tube Boiler.	2
4.4	Description & working of common boilers (Cochran, Lancashire, Babcock & Wilcox Boiler)	2
4.5	Boiler Draught (Forced, induced & balanced)	2
4.6	Boiler mountings & accessories.	2
5	**Steam Power Cycles**	8
5.1	Carnot cycle with vapour.	2
5.2	Derive work & efficiency of the cycle.	2
5.3	5.3.2 Derive Work & Efficiency.	2
5.4	Solve simple numerical on Carnot vapour Cycle & Rankine Cycle.	2
6	**Heat Transfer**	8
6.1	Modes of Heat Transfer (Conduction, Convection, Radiation).	1
6.2	Fourier law of heat conduction and thermal conductivity (k).	1
6.3	Newton's laws of cooling.	2
6.4	Radiation heat transfer (Stefan, Boltzmann & Kirchhoff's law) only statement, no derivation & no numerical problem.	2
6.5	Black body Radiation, Definition of Emissivity, absorptivity, & transmissibility.	2

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LESSON PLANNER

SUBJECT- THEORY OF MACHINES

FACULTY-AUROBINDA PANDA

MODULE	TOPICS	NO OF PERIODS
1	**Simple mechanism**	8
1.1	Link ,kinematic chain, mechanism, machine	2
1.2	Inversion, four bar link mechanism and its inversion	2
1.3	Lower pair and higher pair	2
1.4	Cam and followers	2
2	**Friction**	12
2.1	Friction between nut and screw for square thread, screw jack	2
2.2	Bearing and its classification, Description of roller, needle roller& ball bearings	2
2.3	Torque transmission in flat pivot& conical pivot bearings.	1
2.4	Flat collar bearing of single and multiple types.	2
22.5	Torque transmission for single and multiple clutches	2
2.6	Working of simple frictional brakes.	1
2.7	Working of Absorption type of dynamometer	2
3	**Power Transmission**	12
3.1	Concept of power transmission	1
3.2	Type of drives, belt, gear and chain drive.	1
3.3	Computation of velocity ratio, length of belts (open and cross)with and without slip.	2
3.4	Ratio of belt tensions, centrifugal tension and initial tension.	1
3.5	Power transmitted by the belt.	1
3.6	centrifugal tension.	2
3.7	V-belts and V-belts pulleys.	1
3.8	Concept of crowning of pulleys.	1
3.9	Gear drives and its terminology.	1
3.10	Gear trains, working principle of simple, compound, reverted and epicyclic gear trains.	1
4	**Governors and Flywheel**	12
4.1	Function of governor	1
4.2	Classification of governor	2
4.3	Working of Watt, Porter, Proel and Hartnell governors.	2
4.4	Conceptual explanation of sensitivity, stability and isochronisms.	2
4.5	Function of flywheel.	2
4.6	Comparison between flywheel &governor.	1
4.7	Fluctuation of energy and coefficient of fluctuation of speed.	2
5	**Balancing of Machine**	8
5.1	Concept of static and dynamic balancing.	1
5.2	Static balancing of rotating parts.	1
5.3	Principles of balancing of reciprocating parts.	2
5.4	Causes and effect of unbalance	2
5.5	Difference between static and dynamic balancing	2
6	**Vibration of machine parts**	8
6.1	Introduction to Vibration and related terms (Amplitude, time period and frequency, cycle)	2
6.2	Classification of vibration.	2
6.3	Basic concept of natural, forced & damped vibration	2
6.4	Torsional and Longitudinal vibration.	1
6.5	Causes & remedies of vibration.	1

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SUBJECT- MANUFACTURING TECHNOLOGY **FACULTY-MANORANJAN BEHERA**

MODULE	TOPICS	NO OF PERIODS
1	**Tool Materials**	4
1.1	Composition of various tool materials	2
1.2	Physical properties& uses of such tool materials.	2
2	**Cutting Tools**	6
2.1	Cutting action of various and tools such as Chisel, hacksaw blade, dies and reamer	1
2.2	Turning tool geometry and purpose of tool angle	1
2.3	Machining process parameters (Speed, feed and depth of cut)	2
2.4	Coolants and lubricants in machining and purpose	2
3	**Lathe Machine**	8
3.1	Operations carried out in a lathe(Turning, thread cutting, taper turning, internal machining, parting	2
3.2	multiple tool holders	2
3.3	Turret Lathe Difference with respect to capstan lathe Major components and their function	2
3.4	Draw the tooling layout for preparation of a hexagonal bolt &bush	2
4	**Shaper**	6
4.1	Potential application areas of a shaper machine	1
4.2	Major components and their function	1
4.3	Explain the automatic able feed mechanism	1
4.4	Explain the construction &working of tool head	1
4.5	Explain the quick return mechanism through sketch	1
4.6	State the specification of a shaping machine.	1
5	**Planning Machine**	6
5.1	Application area of a planer and its difference with respect to shaper	2
5.2	Major components and their functions	1
5.3	The table drive mechanism	1
5.4	Working of tool and tool support	1
5.5	Clamping of work through sketch.	1
6	**Milling Machine**	8
6.1	Types of milling machine and operations performed by them and also same for CNC milling machine	2
6.2	Explain work holding attachment	2
6.3	Construction & working of simple dividing head, universal dividing head	1
6.4	Procedure of simple and compound indexing	2
6.5	Illustration of different indexing methods	1
7	**Slotter**	6
7.1	*Major components and their function*	2
7.2	Construction and working of slotter machine	2
7.3	Tools used in slotter	2
8	**Grinding**	6
8.1	Significance of grinding operations	2
8.2	Manufacturing of grinding wheels	2
8.3	Criteria for selecting of grinding wheels	2
8.4	Centreless Grinder	
9	**Internal Machining operations**	6
9.1	Working of Bench drilling machine Pillar drilling machine Radial drilling machine	2
9.2	Boring Basic Principle of Boring Different between Boring and drilling	2
9.3	Broaching Types of Broaching(pull type, push type) Advantages of Broaching and applications	2
10	**Surface finish, lapping**	4
10.1	Definition of Surface finish	2
10.2	Description of lapping& explain their specific cutting.	2

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	SUB:- MECHATRONICS (5TH SEM) FACULTY NAME:- AUROBINDA PANDA	
MODULE NO.	TOPICS TO BE COVERED	NO. OF PERIODS
1. 0	**INTRODUCTION TO MECHATRONICS**	**5**
1. 1	Definition of Mechatronics	1
1. 2	*Advantages & disadvantages of Mechatronics*	1
1. 3	Application of Mechatronics	1
1. 4	Scope of Mechatronics in Industrial Sector	1
1. 5	Components of a Mechatronics System	1
1. 6	Importance of mechatronics in automation	1
2. 0	**SENSORS AND TRANSDUCERS**	**10**
2. 1	Defination of Transducers	1
2. 2	Classification of Transducers	2
2. 3	Electromechanical Transducers	1
2. 4	Transducers Actuating Mechanisms	1
2. 5	Displacement &Positions Sensors	2
2. 6	Velocity, motion, force and pressure sensors.	1
2. 7	Temperature and light sensors.	1
3. 0	***ACTUATORS-MECHANICAL, ELECTRICAL***	***10***
3. 1	Mechanical Actuators	1
3. 1. 1	Machine, Kinematic Link, Kinematic Pair	2
3. 1. 2	Mechanism, Slider crank Mechanism	2
3. 1. 3	Gear Drive, Spur gear, Bevel gear, Helical gear, worm gear	1
3. 1. 4	Belt & Belt drive	1
3. 1. 5	Bearings	1
3. 2	Electrical Actuator	1
3. 2. 1	Switches and relay	1
3. 2. 2	Solenoid	2
3. 2. 3	D.C Motors	2
3. 2. 4	A.C Motors	2
3. 2. 5	Stepper Motors	1
3. 2. 6	*Specification and control of stepper motors*	1
3. 2. 7	Servo Motors D.C & A.C	2
4. 0	**PROGRAMMABLE LOGIC CONTROLLERS(PLC)**	**15**
4. 1	Introduction	2
4. 2	Advantages of PLC	2
4. 3	Selection and uses of PLC	2
4. 4	Architecture basic internal structures	1
4. 5	Input/output Processing and Programming	1
4. 6	Mnemonics	1
4. 7	Master and Jump Controllers	1
5. 0	**ELEMENTS OF CNC MACHINES**	**15**
5. 1	Introduction to Numerical Control of machines and CAD/CAM	2
5. 1. 1	NC machines	1
5. 1. 2	CNC machines	2
5. 1. 3	CAD/CAM	2
5. 1. 3. 1	CAD	2
5. 1. 3. 2	CAM	2
5. 1. 3. 3	Software and hardware for CAD/CAM	2

5. 1. 3. 4	Functioning of CAD/CAM system	2
5. 1. 3. 5	Features and characteristics of CAD/CAM system	2
5. 1. 3. 6	Application areas for CAD/CAM	2
5. 2	elements of CNC machines	2
5. 2. 1	Introduction	2
5. 2. 2	Machine Structure	2
5. 2. 3	Guideways/Slide ways	1
5. 2. 3. 1	Introduction and Types of Guideways	1
5. 2. 3. 2	Factors of design of guideways	2
5. 2. 4	Drives	2
5. 2. 4. 1	Spindle drives	2
5. 2. 4. 2	Feed drive	2
5. 2. 5	Spindle and Spindle Bearings	2
6. 0	**ROBOTICS**	**5**
6. 1	Definition, Function and laws of robotics	1
6. 2	Types of industrial robots	2
6. 3	Robotic systems	1
6. 4	Advantages and Disadvantages of robots	2

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	GIACR DIPLOMA (RAYAGADA)	
	MECHANICAL BRANCH	
	SUB:- HYDRAULIC MACHINES & INDUSTRIAL FLUID POWER (5TH SEM) FACULTY NAME:- MANORANJAN BEHERA	
MODULE NO.	TOPICS TO BE COVERED	NO. OF PERIODS
1.0	HYDRAULIC TURBINES.	15
1.1	Definition and classification of hydraulic turbines	2
1.2	Construction and working principle of impulse turbine.	2
1.3	Velocity diagram of moving blades, work done and derivation of various efficiencies of impulse turbine.	2
1.4	Velocity diagram of moving blades, work done and derivation of various efficiencies of Francis turbine.	3
1.5	Velocity diagram of moving blades, work done and derivation of various efficiencies of Kaplan turbine	3
1.6	Numerical on above	2
1.7	Distinguish between impulse turbine and reaction turbine.	1
2.0	CENTRIFUGAL PUMPS	5
2.1	Construction and working principle of centrifugal pumps	1
2.2	Work done and derivation of various efficiencies of centrifugal pumps.	2
2.3	Numerical on above	2
3.0	RECIPROCATING PUMPS	10
3.1	Describe construction & working of single acting reciprocating pump.	2
3.2	Describe construction & working of double acting reciprocating pump.	2
3.3	Derive the formula foe power required to drive the pump (Single acting & double acting)	1
3.4	Define slip.	2
3.5	State positive & negative slip & establish relation between slip & coefficient of discharge.	1
3.6	Solve numerical on above	2
4.0	PNEUMATIC CONTROL SYSTEM	20
4.1	Elements –filter-regulator-lubrication unit	2
4.2	Pressure control valves	2
4.2.1	Pressure relief valves	2
4.2.2	Pressure regulation valves	2
4.3	Direction control valves	2
4.3.1	3/2DCV,5/2 DCV,5/3DCV	2
4.3.2	Flow control valves	1
4.3.3	Throttle valves	1
4.4	ISO Symbols of pneumatic components	1
4.5	Pneumatic circuits	1
4.5.1	Direct control of single acting cylinder	1
4.5.2	Operation of double acting cylinder	1
4.5.3	Operation of double acting cylinder with metering in and metering out control	1
5.0	HYDRAULIC CONTROL SYSTEM	20
5.1	Hydraulic system, its merit and demerits	1
5.2	Hydraulic accumulators	2
5.2.1	Pressure control valves	2
5.2.2	Pressure relief valves	2
5.2.3	Pressure regulation valves	1
5.3	Direction control valves	2
5.3.1	3/2DCV,5/2 DCV,5/3DCV	2
5.3.2	Flow control valves	2
5.3.3	Throttle valves	2
5.4	Fluid power pumps	2
5.4.1	External and internal gear pumps	2
5.4.2	Vane pump	2
5.4.3	Radial piston pumps	2
5.5	ISO Symbols for hydraulic components.	2
5.6	Actuators	2
5.7	Hydraulic circuits	1
5.7.1	Direct control of single acting cylinder	1
5.7.2	Operation of double acting cylinder	1
5.7.3	Operation of double acting cylinder with metering in and metering out control	2
5.8	Comparison of hydraulic and pneumatic system	2

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	GIACR DIPLOMA (RAYAGADA)	
	MECHANICAL BRANCH	
	SUB:- REFRIGERATION AND AIR CONDITIONING (5TH SEM) FACULTY	
MODULE NO.	TOPICS TO BE COVERED	NO. OF PERIODS
1.0	AIR REFRIGERATION CYCLE	5
1.1	Definition of refrigeration and unit of refrigeration.	1
1.2	Definition of COP, Refrigerating effect (R.E)	2
1.3	Principle of working of open and closed air system of refrigeration.	1
1.3.1	Calculation of COP of Bell-Coleman cycle and numerical on it.	1
2.0	SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM	10
2.1	schematic diagram of simple vapors compression refrigeration system'	1
2.2	Types	1
2.2.1	Cycle with dry saturated vapors after compression.	1
2.2.2	Cycle with wet vapors after compression.	1
2.2.3	Cycle with superheated vapors after compression.	1
2.2.4	Cycle with superheated vapors before compression.	2
2.2.5	Cycle with sub cooling of refrigerant	1
2.2.6	Representation of above cycle on temperature entropy and pressure enthalpy diagram	1
2.2.7	Numerical on above (determination of COP,mass flow)	1
3.0	VAPOUR ABSORPTION REFRIGERATION SYSTEM	7
3.1	Simple vapor absorption refrigeration system	1
3.2	Practical vapor absorption refrigeration system	1
3.3	COP of an ideal vapor absorption refrigeration system	3
3.4	Numerical on COP.	2
4.0	REFRIGERATION EQUIPMENTS	8
4.1	REFRIGERANT COMPRESSORS	2
4.1.1	Principle of working and constructional details of reciprocating and rotary compressors.	2
4.1.2	Centrifugal compressor only theory	2
4.1.3	Important terms.	1
4.1.4	Hermetically and semi hermetically sealed compressor.	1
4.2	CONDENSERS	1
4.2.1	Principle of working and constructional details of air cooled and water cooled condenser	1
4.2.2	Heat rejection ratio.	1
4.2.3	Cooling tower and spray pond.	1
4.3	EVAPORATORS	1
4.3.1	Principle of working and constructional details of an evaporator.	1
4.3.2	Types of evaporator.	1
4.3.3	Bare tube coil evaporator, finned evaporator, shell and tube evaporator.	1
5.0	REFRIGERANT FLOW CONTROLS, REFRIGERANTS & APPLICATION OF REFRIGERANTS	10
5.1	EXPANSION VALVES	1
5.1.1	Capillary tube	1
5.1.2	Automatic expansion valve	1
5.1.3	Thermostatic expansion valve	2
5.2	REFRIGERANTS	2
5.2.1	Classification of refrigerants	2
5.2.2	Desirable properties of an ideal refrigerant.	1
5.2.3	Designation of refrigerant.	1
5.2.4	Thermodynamic Properties of Refrigerants.	1
5.2.5	Chemical properties of refrigerants.	1
5.2.6	commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717	1
5.2.7	Substitute for CFC	1
5.3	Applications of refrigeration	1
5.3.1	cold storage	1
5.3.2	dairy refrigeration	1
5.3.3	ice plant	1
5.3.4	water cooler	1
5.3.5	frost free refrigerator	1
6.0	PSYCHOMETRICS &COMFORT AIR CONDITIONING SYSTEMS	10
6.1	Psychometric terms	2
6.2	Adiabatic saturation of air by evaporation of water	2
6.3	Psychometric chart and uses.	2
6.4	Psychometric processes	2
6.4.1	Sensible heating and Cooling	1
6.4.2	Cooling and Dehumidification	2
6.4.3	Heating and Humidification	1
6.4.4	Adiabatic cooling with humidification	1
6.4.5	Total heating of a cooling process	1
6.4.6	SHF, BPF,	1
6.4.7	Adiabatic mixing	1
6.4.8	Problems on above.	1
6.5	Effective temperature and Comfort chart	1
7.0	AIR CONDITIONING SYSTEMS	10
7.1	Factors affecting comfort air conditioning. .	1
7.2	Equipment used in an air-conditioning.	2
7.3	Classification of air-conditioning system	2
7.4	Winter Air Conditioning System	2
7.5	Summer air-conditioning system.	1
7.6	Numerical on above	1

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	GIACR DIPLOMA (RAYAGADA)	
	MECHANICAL BRANCH	
	SUB:- DESIGN OF MACHINE ELEMENTS (5TH SEM) FACULTY NAME:- MALINI JYOTI NEGI	
MODULE NO.	TOPICS TO BE COVERED	NO. OF PERIOD
1. 0	**Introduction:**	**12**
1. 1	Introduction to Machine Design and Classify it.	2
1. 2	Different mechanical engineering materials used in design with their uses and their mechanical and physical properties.	2
1. 3	Define working stress, yield stress, ultimate stress & factor of safety and stress –strain curve for M.S & C.I.	2
1. 4	Modes of Failure (By elastic deflection, general yielding & fracture)	2
1. 5	State the factors governing the design of machine elements.	2
1. 6	Describe design procedure	2
2. 0	**Design of fastening elements:**	**12**
2. 1	Joints and their classification.	1
2. 2	State types of welded joints .	1
2. 3	State advantages of welded joints over other joints.	2
2. 4	Design of welded joints for eccentric loads.	2
2. 5	State types of riveted joints and types of rivets.	2
2. 6	Describe failure of riveted joints.	1
2. 7	Determine strength & efficiency of riveted joints.	1
2. 8	Design riveted joints for pressure vessel.	1
2. 9	Solve numerical on Welded Joint and Riveted Joints.	1
3. 0	**Design of shafts and Keys:**	**12**
3. 1	State function of shafts.	1
3. 2	State materials for shafts.	2
3. 3	Design solid & hollow shafts to transmit a given power at given rpm based on	2
	a) Strength: (i) Shear stress, (ii) Combined bending tension;	1
	b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity	1
3. 4	State standard size of shaft as per I.S.	1
3. 5	State function of keys, types of keys & material of keys.	1
3. 6	Describe failure of key, effect of key way.	1
3. 7	Design rectangular sunk key considering its failure against shear & crushing.	1
3. 8	Design rectangular sunk key by using empirical relation for given diameter of shaft.	1
3. 9	State specification of parallel key, gib-head key, taper key as per I.S.	1
3. 10	Solve numerical on Design of Shaft and keys.	1
4. 0	**Design of Coupling:**	**12**
4. 1	Design of Shaft Coupling	2
4. 2	Requirements of a good shaft coupling	2
4. 3	Types of Coupling.	1
4. 4	Design of Sleeve or Muff-Coupling.	1
4. 5	Design of Clamp or Compression Coupling.	1
4. 6	Solve simple numerical on above.	3
5. 0	**Design a closed coil helical spring:**	**12**
5. 1	Materials used for helical spring.	2
5. 2	Standard size spring wire. (SWG).	3
5. 3	Terms used in compression spring.	2
5. 4	Stress in helical spring of a circular wire.	1
5. 5	Deflection of helical spring of circular wire.	1
5. 6	Surge in spring.	2
5. 7	Solve numerical on design of closed coil helical compression spring.	1

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	SUB:- ENTREPRENEURSHIP AND MANAGEMENT AND SMART TECHNOLOGY (5TH SEM)	
ODULE N	TOPICS TO BE COVERED	NO. OF PERIODS
1.0	**Entrepreneurship**	**10**
1.1	Concept /Meaning of Entrepreneurship	2
1.2	Need of Entrepreneurship	1
1.3	Characteristics, Qualities and Types of entrepreneur, Functions	2
1.4	Barriers in entrepreneurship	2
1.5	Entrepreneurs vrs. Manager	1
1.6	Forms of Business Ownership: Sole proprietorship, partnership forms and others	1
1.7	Types of Industries, Concept of Start-ups	1
1.8	epreneurial support agencies at National, State, District Level(Sources): DIC, NSIC,OSIC, SIDBI, NABARD, Commercial Banks, KVI	1
1.9	Technology Business Incubators (TBI) and Science and Technology Entrepreneur Parks	1
2.0	**Market Survey and Opportunity Identification (Business Planning)**	**8**
2.1	Business Planning	2
2.2	SSI, Ancillary Units, Tiny Units, Service sector Units	1
2.3	Time schedule Plan, Agencies to be contacted for Project Implementation	1
2.4	Assessment of Demand and supply and Potential areas of Growth	1
2.5	Identifying Business Opportunity	2
2.6	Final Product selection	1
3.0	**Project report Preparation**	**4**
3.1	Preliminary project report	1
3.2	Detailed project report, Techno economic Feasibility	1
3.3	Project Viability	1
4.0	**Management Principles**	**1**
4.1	Definitions of management	5
4.2	Principles of management	2
4.3	Functions of management (planning, organising, staffing, directing and controlling etc.)	2
4.4	Level of Management in an Organisation	1
5.0	**Functional Areas of Management**	**10**
5.1	**a)Production management**	**1**
	Functions, Activities	2
	Productivity	2
	Quality control	1
	Production Planning and control	1
5.2	**b) Inventory Management**	**1**
	Need for Inventory management	1
	Models/Techniques of Inventory management	2
5.3	**c) Financial Management**	**1**
	Functions of Financial management	2
	Management of Working capital	2
	Costing (only concept)	1
	Break even Analysis	1
	Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash book, P&L Accounts, Balance Sheets(only Conce	2
5.4	**d) Marketing Management**	**2**
	Concept of Marketing and Marketing Management	1
	Marketing Techniques (only concepts)	1
	Concept of 4P s (Price, Place, Product, Promotion)	2
5.5	**e) Human Resource Management**	**2**
	Functions of Personnel Management	3
	Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training &	2
6.0	**Leadership and Motivation**	**6**
6.1	**a) Leadership**	**2**
	Definition and Need/Importance	1
	Qualities and functions of a leader	1
	Manager Vs Leader	1
	Style of Leadership (Autocratic, Democratic, Participative)	2
6.2	**b) Motivation**	**1**
	Definition and characteristics	1
	Importance of motivation	1
	Factors affecting motivation	1
	Theories of motivation (Maslow)	1
	Methods of Improving Motivation	1
	Importance of Communication in Business	1
	Types and Barriers of Communication	1
7.0	**Work Culture, TQM & Safety**	**5**
7.1	Human relationship and Performance in Organization	1
7.2	Relations with Peers, Superiors and Subordinates	1
7.3	TQM concepts: Quality Policy, Quality Management, Quality system	2
7.4	Accidents and Safety, Cause, preventive measures, General Safety Rules , Personal Protection Equipment(PPE)	1
8.0	**Legislation**	**6**
8.1	a) Intellectual Property Rights(IPR), Patents, Trademarks, Copyrights	2
8.2	b) Features of Factories Act 1948 with Amendment (only salient points)	2
8.3	c) Features of Payment of Wages Act 1936 (only salient points)	2
9.0	**Smart Technology**	**6**
9.1	Concept of IOT, How IOT works	2
9.2	Components of IOT, Characteristics of IOT, Categories of IOT	2
9.3	Applications of IOT- Smart Cities, Smart Transportation, Smart Home, Smart Healthcare, Smart Industry, Smart Agriculture,	2

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SUB-AMP FACULTY NAME-RATIRANJAN MAHARANA

MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS
1	**Modern Machining Processes**	20
1.1	Introduction – comparison with traditional machining	2
1.2	Ultrasonic Machining: principle, Description of equipment, applications	3
1.3	Output characteristics, applications	2
1.4	Wire cut EDM: Principle, Description of equipment, controlling parameters; applications.	2
1.5	Abrasive Jet Machining: principle, description of equipment, Material removal rate, application.	2
1.6	Laser Beam Machining: principle, description of equipment, Material removal rate, application.	3
1.7	Electro Chemical Machining: principle, description of equipment, Material removal rate, application	2
1.8	characterization, Applications	2
1.9	characterization, Applications.	2
2	**Plastic Processing**	10
2.1	Processing of plastics	2
2.2	Moulding processes: Injection moulding, Compression moulding, Transfer moulding	2
2.3	Extruding; Casting; Calendering	2
2.4	Fabrication methods-Sheet forming, Blow moulding, Laminating plastics (sheets, rods & tubes), Reinforcing	2
2.5	Applications of Plastics	2
3	**Additive Manufacturing Process**	15
3.1	Introduction, Need for Additive Manufacturing	2
3.2	Fundamentals of Additive Manufacturing, AM Process Chain	2
3.3	Advantages and Limitations of AM, Commonly used Terms	2
3.4	technologies	2
3.5	Medical and Bioengineering Applications.	3
3.6	Web Based Rapid Prototyping Systems	2
3.7	prototyping processes	2
4	**Special Purpose Machines (SPM):**	7
4.1	Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design.	7
5	**Maintenance of Machine Tools**	8
5.1	Housekeeping. Introduction to Total Productive Maintenance (TPM).	8

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SUB-PSE FACULTY NAME-MALINI JYOTI NEGI

MODULE NO	TOPICS TO BE COVERED	NO OF PERIO
1	**INTRODUCTION**	5
1.1	*Describe sources of energy*	1
1.2	Explain concept of Central and Captive power station	1
1.3	Classify power plants	1
1.4	Importance of electrical power in day today life	1
1.5	Overview of method of electrical power generation	1
2	**THERMAL POWER STATIONS**	20
2.1	Layout of steam power stations	2
2.2	Steam power cycle. Explain Carnot vapour power cycle with P-V, T-s diagram and determine thermal efficiency.	4
2.3	Explain Rankine cycle with P-V, T-S & H-s diagram and determine thermal efficiency, Work done, work ratio, and specific steam Consumption	4
2.4	Solve Simple Problems	3
2.5	List of thermal power stations in the state with their capacities	3
2.6	Boiler Accessories: Operation of Air pre heater, Operation of Economiser, Operation Electrostatic precipitator and Operation of super heater. Need of boiler mountings and operation of boiler	4
3	**NUCLEAR POWER STATIONS**	10
3.1	Classify nuclear fuel (Fissile & fertile material	1
3.2	Explain fusion and fission reaction	1
3.3	Explain working of nuclear power plants with block diagram	2
3.4	Explain the working and construction of nuclear reactor	1
3.5	Compare the nuclear and thermal plants	1
3.6	Explain the disposal of nuclear waste	1
3.7	Selection of site for nuclear power stations	1
3.8	List of nuclear power stations	2
4	**DIESEL ELECTRIC POWER STATIONS**	10
4.1	State the advantages and disadvantages of diesel electric power stations	2
4.2	Explain briefly different systems of diesel electric power stations: Fuel storage and fuel supply system, Fuel injection system, Air supply system, Exhaust system, cooling system, Lubrication system, starting system, governing system.	4
4.3	Selection of site for diesel electric power stations	2
4.4	Performance and thermal efficiency of diesel electric power stations.	2
5	**HYDEL POWER STATIONS**	10
5.1	State advantages and disadvantages of hydroelectric power plant.	2
5.2	Classify and explain the general arrangement of storage type hydroelectric project and explain its operation	2
5.3	Selection of site of hydel power plant	2
5.4	List of hydro power stations with their capacities and number of units in the state	1
5.5	Types of turbines and generation used	1
5.6	Simple problems	1
6	**GAS TURBINE POWER STATIONS**	5
6.1	Selection of site for gas turbine stations	2
6.2	Fuels for gas turbine	1
6.3	Elements of simple gas turbine power plants	1
6.4	Merits, demerits and application of gas turbine power plants	1

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SUB-AE&HV FACULTY NAME-MANORANJAN BEHERA

MODULE	TOPICS TO BE COVERED	NO OF PERIO
1	**INTRODUCTION & TRANSMISSION SYSTEM**	**12**
1.1	Automobiles: Definition, need and classification: Layout of automobile chassis with major components (Line diagram)	2
1.2	Clutch System: Need, Types (Single & Multiple) and Working principle with sketch	2
1.3	Gear Box: Purpose of gear box, Construction and working of a 4 speed gear box	2
1.4	Concept of automatic gear changing mechanisms	2
1.5	Propeller shaft: Constructional features	2
1.6	Differential: Need, Types and Working principle	2
2	**BRAKING SYSTEM**	**5**
2.1	Braking systems in automobiles: Need and types	1
2.2	Mechanical Brake	1
2.3	Hydraulic Brake	1
2.4	Air Brake	1
2.5	Air assisted Hydraulic Brake	1
2.6	Vacuum Brake	1
3	**IGNITION & SUSPENSION SYSTEM**	**10**
3.1	Describe the Battery ignition and Magnet ignition system	2
3.2	Spark plugs: Purpose, construction and specifications	2
3.3	State the common ignition troubles and its remedies	2
3.4	Description of the conventional suspension system for Rear and Front axle	2
3.5	Description of independent suspension system used in cars (coil spring and tension bars)	1
3.6	Constructional features and working of a telescopic shock absorber	1
4	**COOLING AND LUBRICATION**	**8**
4.1	Engine cooling: Need and classification	2
4.2	Describe defects of cooling and their remedial measures	2
4.3	Describe the Function of lubrication	2
4.4	Describe the lubrication System of I.C. engine	2
5	**FUEL SYSTEM**	**10**
5.1	Describe Air fuel ratio	2
5.2	Describe Carburetion process for Petrol Engine	2
5.3	Describe Multipoint fuel injection system for Petrol Engine	2
5.4	Describe the working principle of fuel injection system for multi cylinder Engine 5.5 Filter for Diesel engine	2
5.5	Describe the working principle of Fuel feed pump and Fuel Injector for Diesel engine	2
6	**ELECTRIC AND HYBRID VEHICLES**	**15**
6.1	Introduction, Social and Environmental importance of Hybrid and Electric Vehicles	2
6.2	Description of Electric Vehicles, operational advantages, present performance and applications of Electric Vehicles	3
6.3	Battery for Electric Vehicles, Battery types and fuel cells	3
6.4	Hybrid vehicles, Types of Hybrid and Electric Vehicles: Parallel, Series, Parallel and Series configurations;	3
6.5	Drive train	2
6.6	Solar powered vehicles	2

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SUB-IEM FACULTY NAME-N.N PANDA

MODULE NO	TOPICS TO BE COVERED	NO OF PERIODS
1	**PLANT ENGINEERING:**	10
1.1	Selection of Site of Industry	1
1.2	Define plant layout	1
1.3	Describe the objective and principles of plant layout.	1
1.4	Explain Process Layout, Product Layout and Combination Layout.	1
1.5	Techniques to improve layout	1
1.6	Plant maintenance	1
1.7	Importance of plant maintenance	1
1.8	Break down maintenance	1
1.9	Preventive maintenance	1
1.10	Scheduled maintenance	1
2	**OPERATIONS RESEARCH**	10
2.1	Introduction to Operations Research and its applications	2
2.2	Define Linear Programming Problem	2
2.3	Solution of L.P.P. by graphical method	2
2.4	Evaluation of Project completion time by Critical Path Method and PERT (Simple problems)-	2
2.5	Explain distinct features of PERT with respect to CPM	2
3	**INVENTORY CONTROL**	10
3.1	Classification of inventory	1
3.2	Objective of inventory control.	1
3.3	Describe the functions of inventories	1
3.4	Benefits of inventory control.	1
3.5	Costs associated with inventory	1
3.6	Terminology in inventory control	1
3.7	Explain and Derive economic order quantity for Basic model. (Solve numerical)	2
3.8	Define and Explain ABC analysis.	2
4	**INSPECTION AND QUALITY CONTROL**	15
4.1	Define Inspection and Quality control	1
4.2	Describe planning of inspection	1
4.3	Describe types of inspection.	1
4.4	Advantages and disadvantages of quality control	1
4.5	Study of factors influencing the quality of manufacture	1
4.6	Explain the Concept of statistical quality control, Control charts (X, R, P and C - charts)	2
4.7	Methods of attributes.	2
4.8	Concept of ISO 9001-2008.	1
4.9	Quality management system, Registration /certification procedure	1
4.10	Benefits of ISO to the organization.	1
4.11	JIT, Six sigma,7S, Lean manufacturing	1
4.12	Solve related problems	2
5	**PRODUCTION PLANNING AND CONTROL**	15
5.1	Introduction	1
5.2	Major functions of production planning and control	2
5.3	Methods of forecasting	1
5.4	Routing	1
5.5	Scheduling	2
5.6	Dispatching	1
5.7	Controlling	1
5.8	Types of production	1
5.9	Mass production	2
5.10	Batch production	1
5.11	Job order production	1
5.12	Principles of product and process planning	1

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