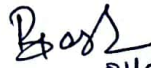| Discipline Mechanical Engineering	5th Semester	Name Of The Faculty: K. Satyanarayan Achary (Lect. In English)
Subject : Entrepreneurship and Management and Smart Technology	No of Days per week class alloted (4 nos)	Semester from 01/09/2020
Week	Class days	Theory Topic
1st	1st	Entrepreneurship : Concept /Meaning of Entrepreneurship & Need of Entrepreneurship
	2nd	Barriers in entrepreneurship and their possible solutions
	3rd	Entrepreneurs vrs. Manager; Characteristics, Qualities and Types of entrepreneur, Functions
	4th	Entrepreneurial support agencies at National, State, District Level(Sources) &
2nd	1st	Definition of Business and its basic components
	2nd	Meaning, Features and Charactrestics of different forms of Business based on ownership
	3rd	Definition and Types of Industries & Concept of Start-ups
	4th	Business planning: Market Survey and Opportunity Identification
3rd	1st	SSI, Ancillary Units, Tiny Units, Service sector Units
	2nd	Time schedule Plan, Agencies to be contacted for Project Implementation
	3rd	Assessment of Demand and supply and Potential areas of Gro
	4th	Identifying Business Opportunity and selection of final product
4th	1st	Meaning and Concept of Business Report (Project)
	2nd	Project report Preparation
	3rd	Preliminary project report & Detailed project report
	4th	Techno economic Feasibility & Project Viability
5th	1st	Definitions and Principles of management
	2nd	Functions and importance of management (planning, organising, staffing, directing and controlling e
	3rd	Production management, Functions, Activities
	4th	Production Planning and control: Productivity & Quality control
6th	1st	Inventory Management: Meaning and Necessity
	2nd	Models/Techniques of Inventory management
	3rd	Financial Management: Meaning & Functions
	4th	Management of Working capital
7th	1st	Break even Analysis
	2nd	Costing : concept
	3rd	Accounting Terminologies: Book Keeping, Journal entry,
	4th	Petty Cash book, P&L Accounts, Balance Sheets (only Concepts)
8th	1st	Concept of Market and Marketing Management
	2nd	Marketing Techniques : Concept of 4P s (Price, Place, Product, Promotion)
	3rd	Human Resource Management: Meaning and Functions
	4th	Manpower Planning, Recruitment, Sources of manpower, Selection process.
9th	1st	Method of Testing, Methods of Training & Development, Payment of Wages
	2nd	Leadership: Definition and Need/Importance
	3rd	Manager Vs Leader; Qualities and functions of a leader
	4th	Style of Leadership (Autocratic, Democratic, Participative)
10th	1st	Motivation: Definition, importance and its Theories
	2nd	Methods of Improving Motivation
	3rd	Importance of Communication in Business
	4th	Types and Barriers of Communication and ways to overcome them
11th	1st	Human relationship and Performance in Organization
	2nd	TQM concepts: Quality Policy, Quality Management, Quality system
	3rd	Accidents and Safety, preventive measures, General Safety Rules , Personal Protection Equipment
	4th	Intellectual Property Rights(IPR), Patents, Trademarks, Copyrights
12th	1st	Factories Act 1948 & Payment of Wages Act 1936 (only salient features and amendemnets)
	2nd	Smart Technology and concept of IOT
	3rd	Methodology of IOT and its advantages
	4th	Components of IOT, Characteristics of IOT, Categories of IOT
13th	1st	Applications of IOT- Smart Cities, Smart Transportation, Smart Home
	2nd	Application of IOT: Smart Healthcare, Smart Industry, Smart Agriculture, Smart Energy Managemen
	3rd	REVISION, MOCK TESTS, ASSESSMENT
	4th	PREVIOUS YEAR QUESTION PAPER DISCUSSION, DOUBT CLEAR, DRILLING

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Discipline Mechanical Engineering   5th Semester

Name Of The Faculty : Sri Sagan Kuman Behere

Subject : Design Of Machine Elements	No of Days per week class alloted (4 nos)	Semester from 01/09/2020
Week	Class days	Theory Topic
1st	1st	Introduction to Machine Design
	2nd	Classification of Machine Design
	3rd	Different mechanical engineering materials used in design
	4th	Engineering materials Physical Properties
2nd	1st	Engineering materials Mechanical Properties
	2nd	Define Working Stress
	3rd	Define yield Stress
	4th	Define Ultimate Stress
3rd	1st	Factor of Safety
	2nd	Modes of Failure (By elastic deflection. general vielding & fracture)
	3rd	State the factors governing the design of machine elements.
	4th	Describe design procedure.
4th	1st	Joints and their classification.
	2nd	State types of welded joints
	3rd	State advantages of welded joints over other joints
	4th	Design of welded joints for eccentric loads.
5th	1st	State types of riveted joints
	2nd	Describe failure of riveted joints.
	3rd	Determine strength riveted joint
	4th	Design riveted joints for pressure vessel
6th	1st	Solve numerical on Welded Joint
	2nd	Solve numerical on Riveted Joint
	3rd	Solve numerical on Welded Joint and Riveted Joints.
	4th	Solve numerical on Welded Joint and Riveted Joints.
	1st	State function of shafts.

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7th	2nd	State materials for shafts
	3rd	Design solid & hollow shafts to transmit a given power at given rpm based on Strength
	4th	Design solid & hollow shafts to transmit a given power at given rpm based on Rigidity
8th	1st	State standard size of shaft as per I.S.
	2nd	State function of Keys & Types of Keys
	3rd	Materials of Keys
	4th	Describe failure of key, effect of key way
9th	1st	Design rectangular sunk key considering its failure against shear & crushing.
	2nd	Design rectangular sunk key by using empirical relation for given diameter of shaft.
	3rd	State specification of parallel key, gib-head key, taper key as per
	4th	Solve numerical on Design of Shaft and keys.
10th	1st	Introduction to Design of Shaft Coupling
	2nd	Requirements of a good shaft coupling
	3rd	Types of Coupling.
	4th	Design of Sleeve or Muff-Coupling
11th	1st	Design of Sleeve or Muff-Coupling
	2nd	Design of Clamp or Compression Coupling.
	3rd	Design of Clamp or Compression Coupling.
	4th	Revision
12th	1st	Solve simple Numerical on Sleeve
	2nd	Solve simple Numerical on Sleeve
	3rd	Solve simple Numerical on Compression Coupling
	4th	Solve simple Numerical on Compression Coupling
13th	1st	Introduction to Helical Springs
	2nd	Materials used for helical spring.
	3rd	Standard size spring wire. (SWG).
	4th	Standard size spring wire. (SWG).
14th	1st	Terms used in Compression Spring
	2nd	Stress in helical spring of a circular wire.
	3rd	Deflection of helical spring of circular wire.
	4th	Surge in spring.
15th	1st	Solve numerical on design of closed coil helical compression spring.
	2nd	Solve numerical on design of closed coil helical compression spring.

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| 15th | 3rd | Solve numerical on design of closed coil helical compression spring. |
| | 4th | Solve numerical on design of closed coil helical compression spring. |

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Discipline Mechanical Engineering	5th Semester	Name Of The Faculty : Sri Sakti Ranjan Bhujee
Subject : Mechatronics	No of Days per week class alloted (4 nos)	Semester from 01/09/2020

Week	Class days	Theory Topic
1st	1st	Definition of Mechatronics
	2nd	Advantages & disadvantages of Mechatronics
	3rd	Application of Mechatronics
	4th	Scope of Mechatronics in Industrial Sector
2nd	1st	Importance of mechatronics in automation
	2nd	Introduction to Transducers
	3rd	Defination of Transducers
	4th	Classification of Transducers
3rd	1st	Electromechanical Transducers
	2nd	Transducers Actuating Mechanisms
	3rd	Displacement &Positions Sensors
	4th	Velocity, motion, force and pressure sensor
4th	1st	Velocity, motion, force and pressure sensor
	2nd	Temperature and light sensors.
	3rd	Mechanical Actuators
	4th	Machine, Kinematic Link, Kinematic Pair
5th	1st	Mechanism, Slider crank Mechanism
	2nd	Gear Drive, Spur gear, Bevel gear, Helical gear, worm gear
	3rd	Belt & Belt drive
	4th	Bearings
6th	1st	Electrical Actuator
	2nd	Switches and relay
	3rd	Solenoid
	4th	D.C Motors
7th	1st	A.C Motors
	2nd	Stepper Motors

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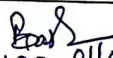|		
7th	3rd	Specification and control of stepper motors
	4th	Servo Motors D.C & A.C
8th	1st	PROGRAMMABLE LOGIC CONTROLLERS(PLC)
	2nd	Advantages of PLC
	3rd	Selection and uses of PLC
	4th	Architecture basic internal structures
9th	1st	Input/output Processing and Programming
	2nd	Mnemonics
	3rd	Master and Jump Controllers
	4th	Master and Jump Controllers
10th	1st	Introduction to Numerical Control of machines and CAD/CAM
	2nd	NC machines
	3rd	CNC machines
	4th	CAD/CAM
11th	1st	Software and hardware for CAD/CAM
	2nd	Functioning of CAD/CAM system
	3rd	Features and characteristics of CAD/CAM system
	4th	Application areas for CAD/CAM
12th	1st	elements of CNC machines
	2nd	Guideways/Slide ways
	3rd	Introduction and Types of Guideways
	4th	Factors of design of guideways
13th	1st	Spindle drives
	2nd	Spindle and Spindle Bearings
	3rd	Definition, Function and laws of robotics
	4th	Types of industrial robots
14th	1st	Robotic systems
	2nd	Advantages and Disadvantages of robots
	3rd	
	4th	
15th	1st	
	2nd	
	3rd	
	4th	

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Discipline Mechanical Engineering	5th Semester	Name Of The Faculty : Sri Manoj Kumar Das	
Subject : Hydraulic Machine & Industrial Fluid Power	No of Days per week class alloted (4 nos)	Semester from 01/09/2020	
Week	Class days	Theory Topic	
1st	1st	Introduction to Hydraulic Turbines	
	2nd	Defination of Hydraulic Turbines	
	3rd	Classification of Hydraulic Turbines	
	4th	Construction of Impulse Turbine	
2nd	1st	Working Principle of Impulse Turbine	
	2nd	Velocity Diagram of Working blades	
	3rd	Workdone of Impulse Turbine	
	4th	derivation of various efficiencies of impulse turbine	
3rd	1st	Velocity Diagram of Moving blades	
	2nd	Workdone of Francis Turbine	
	3rd	d derivation of various efficiencies of Francis turbine	
	4th	Velocity diagram of moving blades	
4th	1st	Workdone of Kaplan Turbine	
	2nd	Derivations of various Efficiencies of Kaplant Turbine	
	3rd	Revision	
	4th	Introduction to Centrifugal Pump	
5th	1st	Construction and working principle of centrifugal pumps	
	2nd	Workdone of Centrifugal Pump	
	3rd	Various efficiencies of centrifugal pumps	
	4th	Numerical on Centrifugal Pump	
6th	1st	Introduction to Reciprocating Pump	
	2nd	Describe Construction to Resiprocating Pump	
	3rd	Working of single acting reciprocating pump	
	4th	Describe Construction to Double acting Resiprocating Pump	
7th	1st	Define formula for power required to drive the pump for single acting	
	2nd	Define formula for power required to drive the pump for single acting	

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	3rd	Define formula for power required to drive the pump for double acting
	4th	Define formula for power required to drive the pump for double acting
8th	1st	State positive &amp
	2nd	State negative slip &amp
	3rd	Relation between slip and coefficient of Discharge
	4th	Numerical on Single acting and double acting
9th	1st	Introduction to Pneumatic Control System
	2nd	I Elements –filter-regulator-lubrication unit
	3rd	Pressure control valves
	4th	Pressure relief valves
10th	1st	Pressure regulation valves
	2nd	Direction control valves
	3rd	3/2DCV,5/2 DCV,5/3DCV
	4th	Flow control valves
11th	1st	Throttle valves
	2nd	ISO Symbols of pneumatic components
	3rd	Pneumatic circuits
	4th	Direct control of single acting cylinder
12th	1st	Operation of double acting cylinder
	2nd	Operation of double acting cylinder with metering in and metering out control
	3rd	Operation of double acting cylinder with metering in and metering out control
	4th	Operation of double acting cylinder with metering in and metering out control
13th	1st	Hydraulic system, its merit and demerits
	2nd	Hydraulic accumulator
	3rd	Pressure control valves
	4th	Pressure relief valves
14th	1st	Pressure regulation valves
	2nd	Direction control valves
	3rd	3/2DCV,5/2 DCV,5/3DCV
	4th	Flow control valves
15th	1st	Fluid power pumps
	2nd	ISO Symbols for hydraulic components.
	3rd	Actuators
	4th	Comparison of hydraulic and pneumatic system

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Discipline Mechanical Engineering	5th Semester		Name Of The Faculty : Sri Bipin Kumar Dash
Subject : Refrigeration & Air Conditioning	No of Days per week class alloted (4 nos)		Semester from 01/09/2020
Week	Class days		Theory Topic
1st	1st		Definition of refrigeration and unit of refrigeration.
	2nd		Definition of COP, Refrigerating effect (R.E)
	3rd		Principle of working of open and closed air system of refrigeration
	4th		Calculation of COP of Bell-Coleman cycle and numerical on it.
2nd	1st		Revision
	2nd		schematic diagram of simple vapors compression refrigeration system'
	3rd		Cycle with dry saturated vapors after compression
	4th		Cycle with wet vapors after compression.
3rd	1st		Cycle with superheated vapors after compression.
	2nd		Cycle with superheated vapors before compression
	3rd		Cycle with sub cooling of refrigerant
	4th		Representation of above cycle on temperature entropy and pressure enthalpy diagram
4th	1st		Numerical on above (determination of COP,mass flow)
	2nd		Simple vapor absorption refrigeration system
	3rd		Practical vapor absorption refrigeration system
	4th		COP of an ideal vapor absorption refrigeration system
5th	1st		Numerical on COP
	2nd		REFRIGERANT COMPRESSORS
	3rd		Principle of working and constructional details of reciprocating and rotary compressors
	4th		Centrifugal compressor only theory
6th	1st		Important terms
	2nd		Hermetically and semi hermetically sealed compressor.
	3rd		Principle of working and constructional details of air cooled and water cooled condenser
	4th		Heat rejection ratio
7th	1st		Cooling tower and spray pond.
	2nd		Principle of working and constructional details of an evaporator.
	3rd		Types of evaporator

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	4th	Bare tube coil evaporator, finned evaporator, shell and tube evaporator
8th	1st	Capillary tube
	2nd	Automatic expansion valve
	3rd	Thermostatic expansion valve
	4th	Classification of refrigerants
9th	1st	Desirable properties of an ideal refrigerant.
	2nd	Designation of refrigerant.
	3rd	Thermodynamic Properties of Refrigerants.
	4th	Chemical properties of refrigerants
10th	1st	commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717
	2nd	Psychometric terms
	3rd	Adiabatic saturation of air by evaporation of water
	4th	Psychometric chart and uses.
11th	1st	Psychometric processes
	2nd	Sensible heating and Cooling
	3rd	Heating and Humidification
	4th	Adiabatic cooling with humidification
12th	1st	Total heating of a cooling process
	2nd	SHF, BPF
	3rd	Adiabatic mixing
	4th	Factors affecting comfort air conditioning
13th	1st	Equipment used in an air-conditioning.
	2nd	Classification of air-conditioning system
	3rd	Winter Air Conditioning System
	4th	Summer air-conditioning system
14th	1st	Numerical on above
	2nd	Revision
	3rd	
	4th	
15th	1st	
	2nd	
	3rd	
	4th	

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