

Discipline : Mechanical Engg.	Semester : 5th
Subject : REFRIGERATION AND AIR CONDITIONING	No.of days/Per weeks Class Alloted Weeks :4
Weeks	Class day
1st(sept-2020)	1st
	2nd
	3rd
	4th
2nd(sept-2020)	1st
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	3rd
	4th
3rd(sept-2020)	1st
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Name of the Teachnig Faculty :

Semester from date : To Date : No.of Weeks : 15

Theory

- Definition of refrigeration and unit of refrigeration.
- Definition of COP, Refrigerating effect (R.E)
- Definition of COP, Refrigerating effect (R.E)
- Principle of working of open and closed air system of refrigeration.
- Principle of working of open and closed air system of refrigeration.
- Calculation of COP of Bell-Coleman cycle and numerical on it.
- schematic diagram of simple vapors compression refrigeration system'
- schematic diagram of simple vapors compression refrigeration system'
- Cycle with dry saturated vapors after compression.
- Cycle with wet vapors after compression.
- Cycle with superheated vapors after compression.
- Cycle with superheated vapors before compression.
- Cycle with sub cooling of refrigerant
- Representation of above cycle on temperature entropy and pressure enthalpy diagram
- Representation of above cycle on temperature entropy and pressure enthalpy diagram
- Numerical on above (determination of COP,mass flow)
- Simple vapor absorption refrigeration system
- Practical vapor absorption refrigeration system
- COP of an ideal vapor absorption refrigeration system
- Numerical on COP.
- Numerical on COP.
- Principle of working and constructional details of reciprocating and rotary compressors.
- Centrifugal compressor only theory
- Important terms.
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- Hermetically and semi hermetically sealed compressor.
- Principle of working and constructional details of air cooled and water cooled condenser
- Heat rejection ratio.
- Cooling tower and spray pond.
- Principle of working and constructional details of an evaporator.
- Types of evaporator.
- Bare tube coil evaporator, finned evaporator, shell and tube evaporator.
- Automatic expansion valve

Thermostatic expansion valve
Classification of refrigerants
Desirable properties of an ideal refrigerant.
Designation of refrigerant.
Thermodynamic Properties of Refrigerants.
Thermodynamic Properties of Refrigerants.
Chemical properties of refrigerants.
commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717
commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717
Substitute for CFC
cold storage,dairy refrigeration
ice plant, water cooler
ice plant, water cooler
frost free refrigerator
frost free refrigerator
Psychometric terms
Psychometric terms
Adiabatic saturation of air by evaporation of water
Adiabatic saturation of air by evaporation of water
Adiabatic saturation of air by evaporation of water
Psychometric chart and uses.
Psychometric chart and uses.
Psychometric processes
Psychometric processes
Sensible heating and Cooling
Sensible heating and Cooling
Cooling and Dehumidification
Cooling and Dehumidification
Heating and Humidification
Heating and Humidification
Adiabatic cooling with humidification
Adiabatic cooling with humidification
Total heating of a cooling process
Total heating of a cooling process
SHF, BPF,
SHF, BPF,
Adiabatic mixing
Adiabatic mixing
Problems on above.
Problems on above.
Problems on above.
Effective temperature and Comfort chart
Effective temperature and Comfort chart
Effective temperature and Comfort chart
Factors affecting comfort air conditioning. .

Factors affecting comfort air conditioning. .
Equipment used in an air-conditioning.
Equipment used in an air-conditioning.
Equipment used in an air-conditioning.
Classification of air-conditioning system
Classification of air-conditioning system
Winter Air Conditioning System
Winter Air Conditioning System
Winter Air Conditioning System
Summer air-conditioning system.
Summer air-conditioning system.
Summer air-conditioning system.
Numerical on above
Numerical on above
Numerical on above

Discipline : Mechanical Engg.	Semester : 5th
Subject : ENTREPRENEURSHIP and MANAGEMENT & SMART TECHNOLOGY	No.of days/Per weeks Class Alloted Weeks :4
Weeks	Class day
1st(sept-2020)	1st
	2nd
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2nd(sept-2020)	1st
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Theory

Concept /Meaning of Entrepreneurship • Need of Entrepreneurship • Characteristics, Qualities and Types of entrepreneur, Functions

Barriers in entrepreneurship • Entrepreneurs vrs. Manager

Forms of Business Ownership: Sole proprietorship, partnership forms and others • Types of Industries, Concept of Start-ups

Entrepreneurial support agencies at National, State, District Level(Sources):
DIC, NSIC,OSIC, SIDBI, NABARD, Commercial Banks, KVIC etc

Technology Business Incubators (TBI) and Science and Technology Entrepreneur Parks

Business Planning • SSI, Ancillary Units, Tiny Units, Service sector Units

Time schedule Plan, Agencies to be contacted for Project Implementation • Assessment of Demand and supply and Potential areas of Growth

Identifying Business Opportunity • Final Product selection

Preliminary project report • Detailed project report, Techno economic Feasibilit
Project Viability

Definitions of management • Principles of management

Functions of management (planning, organising, staffing, directing and controlling etc.)

Level of Management in an Organisation

Production management • Functions, Activities • Productivity • Quality control

Production Planning and control b) Inventory Management • Need for Inventory management

Models/Techniques of Inventory management c) Financial Management • Functions of Financial management

Management of Working capital • Costing (only concept)

Break even Analysis • Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash

Break even Analysis • Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash

Break even Analysis • Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash

Break even Analysis • Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash

Break even Analysis • Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash
Brief idea about Accounting Terminologies: Book Keeping
Brief idea about Accounting Terminologies: Book Keeping
Brief idea about Accounting Terminologies: Book Keeping
Journal entry, Petty Cas
Journal entry, Petty Cas
Journal entry, Petty Cas
book, P&L Accounts, Balance Sheets(only Concepts)
book, P&L Accounts, Balance Sheets(only Concepts)
book, P&L Accounts, Balance Sheets(only Concepts)
book, P&L Accounts, Balance Sheets(only Concepts)
Concept of Marketing and Marketing Management
Marketing Techniques (only concepts) • Concept of 4P s (Price, Place, Product, Promotion)
Marketing Techniques (only concepts) • Concept of 4P s (Price, Place, Product, Promotion)
Functions of Personnel Management
Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages
Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages
Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages
Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages
Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages
Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages
Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages
Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages
Theories of motivation (Maslow) • Methods of Improving Motivation • Importance of Communication in Business
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Theories of motivation (Maslow) • Methods of Improving Motivation • Importance of Communication in Business
Human relationship and Performance in Organization
Human relationship and Performance in Organization
Human relationship and Performance in Organization
Types and Barriers of Communication
Types and Barriers of Communication
Human relationship and Performance in Organization
Human relationship and Performance in Organization
Human relationship and Performance in Organization
Human relationship and Performance in Organization
Relations with Peers, Superiors and Subordinates
Relations with Peers, Superiors and Subordinates
Relations with Peers, Superiors and Subordinates
TQM concepts: Quality Policy
Quality Management, Quality system
• Accidents and Safety,
Cause, preventive measures
General Safety Rules
Personal Protection Equipment(PPE)
Leadership • Definition and Need/Importance • Qualities and functions of a leader
Manager Vs Leader • Style of Leadership (Autocratic, Democratic, Participative Definition and characteristics • Importance of motivation • Factors affecting motivation
Theories of motivation (Maslow) • Methods of Improving Motivation • Importance of Communication in Business
Types and Barriers of Communication
Human relationship and Performance in Organization
Relations with Peers, Superiors and Subordinates
TQM concepts: Quality Policy
Quality Management, Quality system
• Accidents and Safety,
Cause, preventive measures
General Safety Rules
Personal Protection Equipment(PPE)
Personal Protection Equipment(PPE)
Personal Protection Equipment(PPE)
Intellectual Property Rights(IPR)
Patents, Trademarks, Copyrights
Features of Factories Act 1948 with Amendment (only salient points)
Features of Payment of Wages Act 1936 (only salient points)
Concept of IOT
How IOT works
Components of IOT

Characteristics of IOT
Categories of IOT
Applications of IOT- Smart Cities,
Smart Transportation
Smart Home, Smart Healthcare,
Smart Industry
, Smart Agriculture, Smart Energy Management e
, Smart Agriculture, Smart Energy Management e
, Smart Agriculture, Smart Energy Management e

Discipline : Mechanical Engg.	Semester : 5th
Subject : Design of Machine elements	No.of days/Per weeks Class Alloted Weeks :4
Weeks	Class day
1st(sept-2020)	1st
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Theory

Introduction to Machine Design and Classify it

Introduction to Machine Design and Classify it

Different mechanical engineering materials used in design with their uses and their mechanical and physical properties

Different mechanical engineering materials used in design with their uses and their mechanical and physical properties

Different mechanical engineering materials used in design with their uses and their mechanical and physical properties

Define working stress, yield stress, ultimate stress & factor of safety and stress –strain curve for M.S & C.I.

Define working stress, yield stress, ultimate stress & factor of safety and stress –strain curve for M.S & C.I.

Define working stress, yield stress, ultimate stress & factor of safety and stress –strain curve for M.S & C.I.

Modes of Failure (By elastic deflection, general yielding & fracture

Modes of Failure (By elastic deflection, general yielding & fracture

State the factors governing the design of machine elements

State the factors governing the design of machine elements

Describe design procedure.

Joints and their classification.

State types of welded joints .

State types of welded joints .

State advantages of welded joints over other joints.

State advantages of welded joints over other joints.

Design of welded joints for eccentric loads.

Design of welded joints for eccentric loads.

Design of welded joints for eccentric loads.

State types of riveted joints and types of rivets.

State types of riveted joints and types of rivets.

State types of riveted joints and types of rivets.

State types of riveted joints and types of rivets.
State types of riveted joints and types of rivets.
Describe failure of riveted joints
Describe failure of riveted joints
Determine strength & efficiency of riveted joints.
Determine strength & efficiency of riveted joints.
Design riveted joints for pressure vessel
Design riveted joints for pressure vessel
Solve numerical on Welded Joint and Riveted Joints
Solve numerical on Welded Joint and Riveted Joints
Solve numerical on Welded Joint and Riveted Joints
Solve numerical on Welded Joint and Riveted Joints
Solve numerical on Welded Joint and Riveted Joints
State function of shafts. 3.2 State materials for shafts.
State function of shafts. 3.2 State materials for shafts.
Design solid & hollow shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension; b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity
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a) Strength: (i) Shear stress, (ii) Combined bending tension; b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity
Design solid & hollow shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension; b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity
State standard size of shaft as per I.S. 3.5 State function of keys, types of keys & material of keys.
State standard size of shaft as per I.S. 3.5 State function of keys, types of keys & material of keys.
State standard size of shaft as per I.S. 3.5 State function of keys, types of keys & material of keys.
Describe failure of key, effect of key way.
Describe failure of key, effect of key way.
Design rectangular sunk key considering its failure against shear & crushing.
Design rectangular sunk key considering its failure against shear & crushing.

Design rectangular sunk key considering its failure against shear & crushing.
8 Design rectangular sunk key by using empirical relation for given diameter of shaft.
8 Design rectangular sunk key by using empirical relation for given diameter of shaft.
8 Design rectangular sunk key by using empirical relation for given diameter of shaft.
State specification of parallel key, gib-head key, taper key as per I.S.
State specification of parallel key, gib-head key, taper key as per I.S.
Solve numerical on Design of Shaft and keys
Solve numerical on Design of Shaft and keys
Solve numerical on Design of Shaft and keys
Solve numerical on Design of Shaft and keys
Solve numerical on Design of Shaft and keys
Solve numerical on Design of Shaft and keys
Solve numerical on Design of Shaft and keys
Solve numerical on Design of Shaft and keys
Design of Shaft Coupling
Requirements of a good shaft coupling
Types of Coupling.
Types of Coupling.
Design of Sleeve or Muff-Coupling
Design of Sleeve or Muff-Coupling
Design of Sleeve or Muff-Coupling
Design of Clamp or Compression Coupling
Design of Clamp or Compression Coupling
Design of Clamp or Compression Coupling
Design of Clamp or Compression Coupling
Solve simple numerical on above.
Solve simple numerical on above.
Solve simple numerical on above.
Solve simple numerical on above.
Solve simple numerical on above.
Solve simple numerical on above.
Materials used for helical spring
Standard size spring wire. (SWG).
Standard size spring wire. (SWG).
Terms used in compression spring
Terms used in compression spring
Stress in helical spring of a circular wire.
Stress in helical spring of a circular wire.
Deflection of helical spring of circular wire
Deflection of helical spring of circular wire

Surge in spring
Solve numerical on design of closed coil helical compression spring.
Solve numerical on design of closed coil helical compression spring.
Solve numerical on design of closed coil helical compression spring.
Solve numerical on design of closed coil helical compression spring.