GOVT. POLYTECHNIC, NAYAGARH

4TH SEMESTER, MECHANICAL ENGINEERING (2025-26)

SUBJECT:- TH:4(a)- REFRIGERATION AND AIR CONDITIONING

Semester from 22.12.25 to 18.04.26 — **Total Periods -45, Theory- 3P/WEEK**

NAME OF FACULTY:- Sri Saurav Ranjan Pradhan

Sl. No.	Week	Day	Topics to be covered
1	1ST	1st	Introduction to Refrigeration: Definition of Refrigeration, Refrigerating effect, unit of refrigeration, coefficient of performance
		2nd	Types of Refrigeration - Ice, dry ice
		3rd	Steam jet, Throttling
Sl. No.	**Week**	**Day**	**Topics to be covered**
2	2ND	1st	Liquid nitrogen refrigeration
		2nd	Carnot refrigeration Cycle
		3rd	Carnot refrigeration Cycle
Sl. No.	**Week**	**Day**	**Topics to be covered**
3	3RD	1st	Air refrigeration- Bell - Coleman cycle, PV & TS diagram
		2nd	Air refrigeration- Bell - Coleman cycle, PV & TS diagram
		3rd	Advantage and disadvantages in air refrigeration, simple problems
Sl. No.	**Week**	**Day**	**Topics to be covered**
4	4TH	1st	Revision of CH-1 & Assignment Questions
		2nd	Refrigeration systems: Basic Components, Flow diagram of working of Vapour compression cycle
		3rd	Representation of the vapour compression cycle on P-H, T-S & P-V Diagram
Sl. No.	**Week**	**Day**	**Topics to be covered**
5	5TH	1st	Expression for Refrigerating effect, work done and power required; Types of Vapour Compression cycle
		2nd	Effects of super heating and under cooling, its advantages and disadvantages
		3rd	Simple Vapour absorptions cycle and its flow diagram
Sl. No.	**Week**	**Day**	**Topics to be covered**
6	6TH	1st	Simple Electrolux system for domestic units
		2nd	Comparison of Vapour absorption and vapour compression system
		3rd	Simple problems on vapour compression cycle
Sl. No.	**Week**	**Day**	**Topics to be covered**
7	7TH	1st	Simple problems on vapour compression cycle
		2nd	Revision of CH-2 & Assignment Questions
		3rd	Refrigeration equipment: Compressor - types of compressors;Hermetically sealed and Semi hermetically sealed compressor
Sl. No.	**Week**	**Day**	**Topics to be covered**
8	8TH	1st	Condensers - Air Cooled, water cooled
		2nd	Natural and force ight cooling system
		3rd	Natural and force aught cooling system
Sl. No.	**Week**	**Day**	**Topics to be covered**
9	9TH	1st	Advantages and disadvantages of air cooled and water cooled condensers
		2nd	Evaporators - natural, convection
		3rd	Evaporators - forced convection types
Sl. No.	**Week**	**Day**	**Topics to be covered**
		1st	Revision of CH-3 & Assignment Questions

10	10TH	2nd	Refrigerant flow controls: Capillary tube; Automatic Expansion valve
		3rd	Thermo- static expansion valve; High side and low side float valve, Solenoid valve
Sl. No.	**Week**	**Day**	**Topics to be covered**
11	11TH	1st	Evaporator pressure regulator
		2nd	Application of refrigeration: Slow and quick freezing
		3rd	Cold storage and Frozen storage
Sl. No.	**Week**	**Day**	**Topics to be covered**
12	12TH	1st	Dairy refrigeration, Ice making industry
		2nd	Water coolers
		3rd	Revision of CH-4 & Assignment Questions
Sl. No.	**Week**	**Day**	**Topics to be covered**
13	13TH	1st	Air conditioning: Introduction to Air conditioning, Factors affecting Air conditioning
		2nd	Psychometric chart and its use
		3rd	Psychometric process-sensible heating and cooling, Humidifying and dehumidifying
Sl. No.	**Week**	**Day**	**Topics to be covered**
14	14TH	1st	Psychometric process-sensible heating and cooling, Humidifying and dehumidifying
		2nd	Adiabatic saturation process
		3rd	Equipment used in air conditioning cycle, Air conditioning units and plants
Sl. No.	**Week**	**Day**	**Topics to be covered**
15	15TH	1st	Refrigeration and Air-conditioning tools: Tools used in refrigeration and Air conditioner installation, installation procedure
		2nd	Faults in refrigeration and air conditioning system, Servicing procedure
		3rd	Revision of CH-5 & Assignment Questions

REFERENCES:

1. Refrigeration and Air Conditioning – Sadhu Singh, Khanna Book Publishing Co., New Delhi

2.Refrigeration and Air Conditioning – S. Domakundawar, Dhanpat Rai publications.

3. Refrigeration and Air Conditioning – A.S.Sarao & G.S. Gabi, 6th edition, Satya Prakashan publications, Ne Delhi, 2004.

4. Principles of Refrigeration – Roy J.Dossat, 5th edition, Pearson Publications, 2001.

5. Refrigeration and Air Conditioning – M.Zakria Baig, Premier/ Radiant Publishing House.

6. Refrigeration and Air Conditioning – C.P Arora, Tata McGraw Hill Education, 2000.

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