DEPARTMENT OF PHYSICS

SRI Y. N. COLLEGE (AUTONOMOUS)

(Affiliated to Adikavi Nannaya University)

Accredited by NAAC with 'A' grade with a CGPA of 3.40

Recognized by UGC as 'College with Potential for Excellence'

NARSAPUR-534275, W.G.Dist. AP

Certificate Course of Refrigeration and Air Conditioning

For 2023-2024 Batch (w.e.f. 2014-2015)

Unit – 1:- Fundamentals of Thermodynamics

Thermodynamic Systems – Classification of Systems, Definition of State, Path Process Cycle, properties, work, heat , thermal energy, specific heat , enthalpy, flow work – Point and path functions.

Unit – 2:- Laws of thermodynamics

Zeroth law, 1st law, 2nd law of thermodynamics. Laws of perfect gases – Boyle's law, Charle's law, Avagadro's law, Joule's law, Cp ,Cv relations, Isothermal, Isobaric, Isochoric, Adiabatic Process, Polytrophic – pre expansion throtling process.

Unit – 3:- Fundamentals of Refrigeration

Introduction - Definition of Refrigeration – Methods of refrigeration – Applications Of refrigeration, Unit of refrigeration – Coefficient of performance (C.O.P) power required per ton of refrigeration. Air refrigeration systems – Reversed Carnot Cycle, Bell Coleman Cycle – Problems – Open system versus closed system of air refrigeration.

Unit – 4:- Air Conditioning Systems

Room Air Conditioners – Installation – Split Units Fans – Classes of Fans, Types of Fans, Centrifugal Fans, Axial-Flow fans, Fan performance Air Distribution System – Air Filtration, Air Filters.

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MODEL QUESTION PAPER

Time 2 hrs **Max Marks: 50**

SECTION – A

Answer any two of the following **2 X 10 = 20 M**

1. Explain the terms "System", "Surroundings", "heat", "work" and Thermal Energy.
2. Describe the working of Carnot's Engine and derive an expression for its efficiency.
3. Draw P-V and T-O diagrams of a reversed Carnot Cycle applied to a Refrigerating machine and obtain an expression for its C.O.P.
4. Mention the types of Fans.

SECTION – B

Answer any Five of the following **5 X 4 = 20 M**

5. Explain "Plow Work-Point" and "path functions".
6. Define Enthalpy and Specific heat.
7. Derive the relation between Cp and Cv.
8. State and explain second law of thermodynamics.
9. Distinguish between a heat pump and a refrigerator.
10. What are the applications of refrigeration?
11. Explain the important role of Air filters in air conditioning.
12. Explain Split Unit.

SECTION – C

Answer all the questions. **5 X 2 = 10**

13. What is path process cycle?
14. Define Isobaric and Isothermal processes.
15. What is the unit of refrigeration?
16. Define First law of thermodynamics.
17. Define Air Filtration.

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