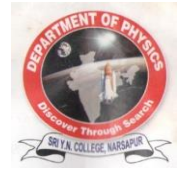




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Certificate Course of Refrigeration and Air Conditioning
2019-2020 Batch



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, Charles's law, Avagadro's law, Joule's law, C_p , C_v relations, Isothermal, Isobaric, Isochoric, Adiabatic Process, Polytropic – pre expansion throttling process.

Unit – 3 :- Fundamentals of Refrigeration:-

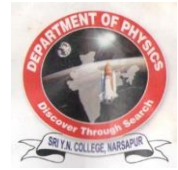
Introduction - Definition of Refrigeration – Methods of refrigeration – Applications Of refrigeration, Unit of refrigeration – Coefficient of performance (C.O.P) power Required per ton of refrigeration. Air refrigeration systems – Reversed Carnot Cycle, Bell Coleman Cycle – Problems – Open system versus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