C 21462

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Name.....

Reg. No.....

EIGHTH SEMESTER B.TECH. [ENGINEERING] DEGREE EXAMINATION, APRIL 2017

ME 09 801—REFRIGERATION AND AIR CONDITIONING

(2009 Admissions)

Time : Three Hours

Maximum : 70 Marks

Part A

Answer **all** *questions.*

1. What are the three primary factors of air on which human comfort depends ?
2. What is meant by Ice refrigeration ?
3. Define RSHF.
4. What factors to be considered while selecting a condenser ?
5. Write five engineering application of' cryogenics'.

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*

6. What is vapour absorption system ? State how its efficiency can be improved ?
7. A Carnot refrigerator requires 1.25 KW per tonne of refrigeration to maintain the temperature of –30°C . Find (i) COP (ii) Temperature at which heat is rejected.
8. Explain the difference between compound vapour compression system with flash cooling and flash inter cooling.
9. What is the effect of clearance volume in a reciprocating compressor explain in detail with p-h Diagram ?
10. Enlighten the physical significance of by-pass factor with reference to a heating coil.
11. Explain any *one* type of condenser.

(4 × 5 = 20 marks)

Part C

12. (a) Illustrate the working of a steam jet refrigeration system with the help of a neat sketch.

Or

Turn over

(b) What is the difference between a refrigerator and a heat pump? Derive an expression for Performance factor for both, if they are running on reversed carnot cycle.

13. (a) Explain briefly with a neat diagram 'practical vapour absorption system'.

Or

(b) Explain two stage compression with inter cooling and sub - cooling by external cooling source.

14. (a) Describe briefly with a neat sketch of a year round air - conditioner.

Or

(b) 250 m^3/min of air at atmospheric conditions 12°C DBT and 50 % RH is supplied to an air conditioned hall. The required conditions are 18°C DBT and 60 % RH. Determine:

(i) Sensible heat and latent heat removed from the air per minute; and

(ii) Sensible heat factor for the system.

15. (a) What are the functions of ducts ? Enumerate duct systems and explain any one of them with a neat sketch.

Or

(b) Enlighten with a neat sketch working of a Thermostatic expansion valve and Automatic expansion valve.

(4 × 10 = 40 marks)