Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (ME) (2012 Onwards) (Sem.–7)

REFRIGERATION AND AIR CONDITIONING

Subject Code : BTME-802

M.Code : 71995

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Write briefly :

1. What is meant by refrigeration effect?
2. Define coefficient of performance.
3. How effectiveness of a refrigeration system is measured?
4. What is sub-cooling?
5. What is the function of a flash intercooler?
6. What is the function of absorber?
7. What is an azeotrope?
8. What are the factors affecting comfort air conditioning?
9. Why condensers are used in an air conditioning system?
10. Define wet bulb temperature.

SECTION-B

11. A refrigerator working on Bell - Coleman cycle operates between pressure limits of 1.05 bar and 8.5 bar. Air is drawn from the cold chamber at 10° C, compressed and then it is cooled to 30° C before entering the expansion cylinder. The expansion and compression follows the law $pv^{1.3}$ = constant. Determine the theoretical C.O.P. of the system.

12. Explain how an actual cycle differs from a theoretical vapour compression cycle.

13. Explain a two stage compression system with liquid intercooler.

14. What are eco-friendly refrigerants? Discuss the action plan to reduce ecological hazards.

15. Explain the working of steam jet refrigeration system with the help of a line diagram.

SECTION-C

16. Draw a neat diagram of lithium bromide water absorption system and explain its working.

17. Explain the air conditioning system required for winter season with the help of a sketch.

18. A two stage compression ammonia refrigerating system with water and flash intercooling and water sub-cooling operates between overall pressure limits of 13.89 bar and 1.9 bar. The flash intercooler pressure is 4.97 bar. The temperature of refrigerant leaving the water intercooler and the water sub-cooler is limited to 30°C. If the load is 10 TR, find :

    a) Coefficient of performance of the system.

    b) Power required to drive each compressor.

    c) Swept volume for each compressor assuming the volumetric efficiency for both the compressor as 80%.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.