

**DIPLOMA – VIEP – MECHANICAL
ENGINEERING (DMEVI)**

Term-End Examination

00462

December, 2017

BIMEE-032 : REFRIGERATION SYSTEMS

Time : 2 hours

Maximum Marks : 70

Note : Answer any *five* questions. Question no. 1 is *compulsory*. All questions carry equal marks. Use of scientific calculator is permitted.

1. Choose the correct answer from the given four alternatives :

7×2=14

- (a) The most common type of vapour absorption system in use for industrial application is
- (i) Freon 12 and water
 - (ii) Freon 22 and water
 - (iii) Ammonia and water
 - (iv) Hydrogen and water

- (b) In a vapour compression system, the working fluid is superheated vapour at entrance to
- (i) evaporator
 - (ii) condenser
 - (iii) compressor
 - (iv) expansion valve
- (c) An ideal refrigerator is operating between a condenser temperature of $+37^{\circ}\text{C}$ and an evaporator temperature of -3°C . If the machine is functioning as a heat pump, its coefficient of performance will be
- (i) 6.00
 - (ii) 6.75
 - (iii) 7.75
 - (iv) 8.75
- (d) In a window air-conditioner, the expansion device used is
- (i) capillary tube
 - (ii) thermostatic expansion valve
 - (iii) float f. valve
 - (iv) automatic expansion valve
- (e) If condenser pressure increases in a vapour compression system
- (i) the COP will increase
 - (ii) the COP will remain the same
 - (iii) the COP will decrease
 - (iv) the COP may increase, decrease or remain the same

- (f) In a vapour compression cycle, the compression process is
- (i) reversible isothermal process
 - (ii) reversible polytropic process
 - (iii) irreversible adiabatic process
 - (iv) reversible adiabatic process
- (g) In which process of vapour compression cycle does entropy decrease ?
- (i) Reversible adiabatic compression
 - (ii) Throttling
 - (iii) Evaporation
 - (iv) Condensation process

2. What are the different types of expansion devices used in refrigeration systems ? Explain any one type in detail with a neat sketch. 14
3. What is the function of an evaporator ? Which types of evaporators are used in refrigeration systems ? Describe in brief. 14
4. Define the term Air-Conditioning System. Enumerate the main parts of the equipment in an air-conditioning system. 14
5. What are the different types of condensers used in a refrigeration system ? Explain the working of any one type of condenser. 14

6. Describe the desirable thermodynamic properties of refrigerants. 14
7. Define COP of a Refrigerator. Show that the COP of a heat pump is greater than the COP of a refrigerator by unity. 14
8. Write short notes on any *two* of the following : $2 \times 7 = 14$
- (a) Transport Air-Conditioning System
 - (b) Leak Detection Methods for Refrigerants
 - (c) Defrosting
 - (d) Filters in Air-Conditioning
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