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**BME-032**

**DIPLOMA IN MECHANICAL  
ENGINEERING (DME)/ADVANCED  
LEVEL CERTIFICATE COURSE IN  
MECHANICAL ENGINEERING  
(DMEVI/ACMEVI)**

**Term-End Examination****June, 2019****BME-032 : REFRIGERATION AND AIR  
CONDITIONING***Time : 2 Hours**Maximum Marks : 70*

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*Note : Answer five questions in all. Question No. 1  
is compulsory. Use of scientific calculator is  
permitted.*

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1. Select the correct alternative answer : 2 each
- (a) In S. I. unit one ton of refrigeration is equal to :
- (i) 210 kJ/min.
  - (ii) 21 kJ/min.
  - (iii) 420 kJ/min.
  - (iv) 840 kJ/min.

- (b) The vapour compressor refrigerator employs the following cycle :
- (i) Rankine
  - (ii) Carnot
  - (iii) Reversed Rankine
  - (iv) Reversed Carnot
- (c) The small size domestic refrigerator uses the following type of the compressor :
- (i) Centrifugal
  - (ii) Axial
  - (iii) Piston type reciprocating
  - (iv) Miniature sealed unit
- (d) On the psychrometric chart, dry bulb temperature lines are :
- (i) Horizontal
  - (ii) Vertical
  - (iii) Curve
  - (iv) Straight inclined sloping downward to the right
- (e) The highest temperature in vapour compression cycle occurs at :
- (i) Receiver
  - (ii) Expansion valve
  - (iii) At the end of compressor
  - (iv) Condenser discharge

- (f) During the sensible cooling process :
- (i) Specific humidity remains constant
  - (ii) Specific humidity increases
  - (iii) Specific humidity decreases
  - (iv) None of the above
- (g) In a heat pump cycle operates between the condenser temperature of  $+ 27^{\circ}\text{C}$  and evaporator temperature of  $- 23^{\circ}\text{C}$ . The COP of Carnot cycle will be :
- (i) 0.2
  - (ii) 1.2
  - (iii) 5
  - (iv) 6
2. (a) Differentiate between 'Wet compression' and 'Dry compression' in a vapour compression refrigeration system. 7
- (b) With the help of block diagram, briefly explain the vapour absorption refrigeration system. 7
3. (a) Discuss the limitations of the Carnot cycle with gas as a refrigerant. 7
- (b) What is the effect of the following on the performance of simple vapour compression cycle ? 7
- (i) Condenser pressure
  - (ii) Suction vapour superheat

4. (a) Differentiate between flooded evaporator and dry expansion evaporator. Describe the working of dry expansion evaporator. 7
- (b) Write the functions of a thermostatic valve. List the different parts of a thermostatic valve. 7
5. (a) Define the term 'sub-cooling'. What is the effect of sub-cooling on compressor work, refrigerating effect and C. O. P. ? 7
- (b) What are the functions fulfilled by a capillary tube in a refrigeration system ? Explain its working. 7
6. Write short notes on the following :  $3\frac{1}{2}$  each
- (a) Primary and secondary refrigerants
- (b) Air cooled condensers
- (c) Dehumidifiers
- (d) Defrosting