GUJARATI UNIVERSITY, AHMEDABAD
QUESTION BANK
SUBJECT: REFRIGERATION (EP-I), B.E. SEM-VIII, MECHANICAL

Note: Each question carry 08 Marks.

<table>
<tr><td>1.</td><td>Define the following terms related to refrigeration
i) One Ton of refrigeration ii) Coefficient of performance (C.O.P.)</td></tr>
<tr><td>2.</td><td>Distinguish four points between vapour compression refrigeration system and vapour absorption refrigeration system.</td></tr>
<tr><td>3.</td><td>Represent Reverse Carnot Cycle on P-V and T-S chart and label the processes.</td></tr>
<tr><td>4.</td><td>Draw a neat labeled sketch and explain working principle of vortex tube refrigeration.</td></tr>
<tr><td>5.</td><td>Draw a neat diagram of Lithium bromide water absorption system and explain its working.</td></tr>
<tr><td>6.</td><td>What is hermetically sealed compressor? Explain its importance in the system over open type compressor.</td></tr>
<tr><td>7.</td><td>A R-12 vapour compression refrigeration system has a condensing temperature of 50o
C. The refrigeration capacity is 7 tons. The liquid leaving the condenser is saturated liquid and compression is isentropic. Determine
i. Refrigerant flow rate
ii. Power required to run the compressor
iii. COP of the system
Take enthalpy at the end of isentropic compression = 210 kJ/kg
Take following properties of R-12
<table><tr><td rowspan="2">Temperature (°C)</td><td colspan="2">Enthalpy (KJ/Kg)</td></tr><tr><td>Liquid</td><td>Vapour</td></tr><tr><td>50</td><td>84.868</td><td>206.298</td></tr><tr><td>0</td><td>36.022</td><td>187.397</td></tr></table></td></tr>
<tr><td>8.</td><td>Explain the effect the of superheating and subcooling in the vapour compression refrigeration system with the help of P-H and T-S chart.</td></tr>
<tr><td>9.</td><td>Draw a neat labeled sketch of steam jet refrigeration.</td></tr>
<tr><td>10.</td><td>What are the desirable properties of an ideal refrigerant?</td></tr>
<tr><td>11.</td><td>Describe the four commercial applications of refrigeration system.</td></tr>
<tr><td>12.</td><td>Write functions of expansion devices. Also list different types of expansion devices.</td></tr>
<tr><td>13.</td><td>Explain working of thermostatic expansion valve with figure.</td></tr>
<tr><td>14.</td><td>What is eco-friendly refrigerant? Give its advantages over conventional type of refrigerants.</td></tr>
</table>

15.	Explain the working principle of evaporative condenser with the help of neat labeled sketch.
16.	Describe the need of air refrigeration system of an aircraft.
17.	With neat labeled sketch explain the working of flooded evaporator. State its application.
18.	Explain the boot strap air cycle refrigeration system with a schematic and cycle diagrams.
19.	Describe simple vapour compression system with p-h diagram.
20.	Write short note on: i. Ozone depletion ii. Global warming.
21.	What are the different types of commpressors? Mention the fields for the use of each in refrigeration systems giving reasons.
22.	Explain the working of a vane type rotary compressor with figure.
23.	What is the difference between dry expansion type and flooded type evaporator.
24.	What are the different types of evaporators used in a vapour compression refrigeration system? Explain the working of any one of them.
25.	What are the advantages and disadvantages of capillary tube over other types of expansion devices?
26.	Explain the working of a automatic expansion valve with the help of a neat sketch.
27.	Describe the working of shell and tube type and shell and coil type evaporators.
28.	Draw a neat line diagram of Electrro - Lux refrigerator and explain its working principle.
29.	What is the situation unnder which the Steam Jet Refrigeration system is recommended? What are its limitations?
30.	What is the difference between a refrigerator and a heat pump?
31.	The capacity of a refrigerator is 200 TR when working between – 8 ^{0}C and 26 ^{0}C. Determine the mass of ice produced per day from water at 26 ^{0}C. Also find the power required to drive the unit. Assume that the cycle operates on reversed Carnot cycle and latent heat of ice is 335 kJ/kg
32.	Explain the working of simple air evaporative cooling system used for air crafts.
33.	Sketch the T-S and p-h diagrams for the vapour compression cycles when the vapour after compression is: i. Dry saturated, and ii. Wet.
34.	Explain a cascade refrigeration system with figure. Show the system on p-h diagram.
35.	Mention the function of each fluid in a three-fluid vapour absorption system.

36.	What is the function of the following components in an absorption system: i. Absorber ii. Rectifier iii. Analyser iv. Heat exchangers
37.	Determine the temperature ratio for a Carnot refrigerator whose C.O.P is 4. What is the refrigeration capacity of the machine in tons of refrigeration if the power consumption is 7.5 kW. If the cycle is used as a heat pump, find its COP.
38.	Describe the important components of a centrifugal compressor with the help of a neat sketch.
39.	Explain working of a refrigeration system with flash chamber with figure.
40.	Explain working of refrigeration system with multiple evaporators of different capacity with figure.