

CBSE Class 12 Air-Conditioning and Refrigeration 2023 - Set 351



Question Paper

Conducted by the Central Board of Secondary Education (CBSE)

Time Allowed: 3 Hours

Maximum Marks: 60

General Instructions

- (i) Please read the instructions carefully.
- (ii) This question paper consists of 24 questions in two Sections: Section A and Section B.
- (iii) Section A has Objective Type Questions whereas Section B contains Subjective Type Questions.
- (iv) Out of the given $(6 + 18) = 24$ questions, a candidate has to answer $(6 + 11) = 17$ questions in the allotted maximum time of 3 hours.
- (v) All questions of a particular section must be attempted in the correct order.
- (vi) Section A: Objective Type Questions (30 marks). This section has 6 questions. There is no negative marking. Follow the instructions given; marks are mentioned against each question/part.
- (vii) Section B: Subjective Type Questions (30 marks). This section has 18 questions; answer 11. Follow the instructions given; marks are mentioned against each question/part.

Section A

1. Answer any 4 questions out of the given 6 questions on Employability Skills : ($4 \times 1 = 4$)

1(i). Which one of the following can be a barrier to become an entrepreneur ?

- | | |
|-----------------------------------|--------------------------------|
| (A) Employee related difficulties | (B) Interacting with customers |
| (C) Gaining and analyzing insight | (D) Resourcing |

1(ii). A rectangular shaped box, where the row and column meet in a spread-sheet is called :

- | | |
|----------|---------------|
| (A) Row | (B) Column |
| (C) Cell | (D) Worksheet |

1(iii). From which one of the following qualities, a person is able to move forward ?

- | | |
|--------------------------|-----------------------|
| (A) Negative attitude | (B) Positive attitude |
| (C) Pessimistic attitude | (D) De-motivation |

1(iv). Which one of the following is a software that helps you type and work with text on a computer ?

- | | |
|--------------------|----------------|
| (A) Graphic card | (B) PowerPoint |
| (C) Word Processor | (D) Screen |

1(v). The activity which occurs when the new venture is started is called

- | | |
|----------------------|----------------------|
| (A) Financial Status | (B) Departure Point |
| (C) Business Skills | (D) Goal Orientation |

1(vi). Which one among the followings is a personality disorder ?

- | | |
|------------------|-----------------------|
| (A) Hard working | (B) Positive attitude |
| (C) Dependent | (D) Independent |

2. Answer any 5 questions out of the given 7 questions : ($5 \times 1 = 5$)

2(i). Condenser in a refrigerator removes :

- | | |
|--------------------------|-------------------------|
| (A) Water of refrigerant | (B) Air of refrigerant |
| (C) Dust of refrigerant | (D) Heat of refrigerant |

2(ii). When the pressure in the discharge line rises above a predetermined pressure, which one among the following control acts ?

- | | |
|------------------|------------------|
| (A) L.P. Control | (B) H.P. Control |
| (C) O.L.P | (D) Thermostat |

2(iii). The storages which are used for short period storage purpose are known as :

- | | |
|-------------------|---------------|
| (A) Ice plants | (B) Freezers |
| (C) Cold storages | (D) Ice rinks |

2(iv). Which one of the following component is used to convert the vapour refrigerant into liquid refrigerant in a refrigerator ?

- | | |
|----------------|----------------|
| (A) Compressor | (B) Condenser |
| (C) Capillary | (D) Evaporator |

2(v). In DX system of air-conditioning, which one among the following working fluid is used ?

- | | |
|-----------------|-----------|
| (A) Refrigerant | (B) Air |
| (C) Water | (D) Brine |

2(vi). What is the name of the instrument which is used to measure the D.B.T. and W.B.T. of air simultaneously ?

- | | |
|--------------------|------------------------|
| (A) Pressure gauge | (B) Thermometer |
| (C) Ammeter | (D) Sling psychrometer |

2(vii). The heat transfer in solids take place through which one of the following modes of heat transfer ?

- | | |
|----------------|----------------|
| (A) Radiation | (B) Conduction |
| (C) Convection | (D) Absorption |

3. Answer any 6 questions out of the given 7 questions : ($6 \times 1 = 6$)

3(i). An overload protector in a refrigerator safeguards compressor motor against which one of the followings ?

- | | |
|--|---------------------|
| (A) Over current | (B) Over heating |
| (C) Both over current and over heating | (D) Low temperature |

3(ii). Capillary tube used in a refrigerator is a :

- | | |
|------------------|---------------------------|
| (A) Valve | (B) A large diameter tube |
| (C) A small wire | (D) A small diameter tube |

3(iii). To increase the moisture content of air, which one among the following psychrometric process is performed ?

- | | |
|----------------------|-----------------------|
| (A) Sensible cooling | (B) Humidification |
| (C) Sensible heating | (D) De-humidification |

3(iv). An automatic expansion valve is installed in a V.C.R. cycle between :

- | | |
|------------------------------|-------------------------------|
| (A) Compressor and Condenser | (B) Evaporator and Compressor |
| (C) Condenser and Evaporator | (D) Anywhere in the cycle |

3(v). In DX system of air-conditioning, which one among the following are used ?

- | | |
|-------------------------|------------------|
| (A) A.H.U. | (B) DX coils |
| (C) Chilled water coils | (D) Water sprays |

3(vi). In Ice plants, which one among the following refrigeration system is used for making of ice ?

- | | |
|--|--|
| (A) Air refrigeration system | (B) Evaporative refrigeration system |
| (C) Liquid nitrogen refrigeration system | (D) V.C.R. system using ammonia as refrigerant |

3(vii). "Heat always flows from high temperature to low temperature by itself." This statement is :

- | | |
|-----------------|------------------|
| (A) True | (B) False |
| (C) May be true | (D) May be false |

4. Answer any 5 questions out of the given 6 questions : ($5 \times 1 = 5$)

4(i). A thermal relay is also known as :

- | | |
|-----------------------------|----------------------|
| (A) Current relay | (B) Voltage relay |
| (C) Bi-metallic strip relay | (D) Electronic relay |

4(ii). To kill the pathogenic bacteria of milk and butter, which one among the following methods is used ?

- | | |
|--------------|--------------------|
| (A) cooling | (B) heating |
| (C) cleaning | (D) pasteurization |

4(iii). A plate type evaporator is used in :

- | | |
|---------------------------|----------------------------|
| (A) Domestic refrigerator | (B) Window air-conditioner |
| (C) Split air-conditioner | (D) Ice plant |

4(iv). A grill provided with dampers is known as :

- | | |
|--------------|--------------|
| (A) Grill | (B) Diffuser |
| (C) Register | (D) Damper |

4(v). Which one of the following component converts liquid refrigerant into vapour refrigerant by absorbing heat from surroundings ?

- | | |
|----------------|----------------|
| (A) Evaporator | (B) Condenser |
| (C) Capillary | (D) Compressor |

4(vi). Supply ducts, outlets and return duct constitutes :

- | | |
|--------------------------------|----------------------------|
| (A) An air-conditioning system | (B) A refrigeration system |
| (C) An air distribution system | (D) An electrical system |

5. Answer any 5 questions out of the given 6 questions : ($5 \times 1 = 5$)

5(i). Which one among the followings is not a psychrometric process ?

- | | |
|-----------------------------|-----------------------------|
| (A) Mixing of air | (B) Sensible heating of air |
| (C) Sensible cooling of air | (D) Cleaning of air |

5(ii). Which one among the followings is a secondary refrigerant ?

- | | |
|----------|-------------------|
| (A) R-12 | (B) Water |
| (C) R-22 | (D) NH_3 |

5(iii). A control which works as a safety control as well as temperature control is known as :

- | | |
|-----------------|-----------------|
| (A) L.P control | (B) H.P control |
| (C) Thermostat | (D) O.L.P |

5(iv). For making ice, transparent, which one among the following method is used in ice plants ?

- | | |
|-----------------------|----------------------|
| (A) Cleaning of water | (B) Air-agitation |
| (C) Cooling of water | (D) Heating of water |

5(v). Which one among the following air-conditioning systems can be used for year round air-conditioning ?

- | | |
|----------------------------|-------------------------------------|
| (A) Window air-conditioner | (B) Split air-conditioner |
| (C) Room cooler | (D) Central air-conditioning system |

5(vi). Which one among the following is a duct layout system ?

- | | |
|---------------------------|---------------------|
| (A) Equal friction method | (B) Parallel system |
| (C) Loop perimeter system | (D) Series system |

6. Answer any 5 questions out of the given 6 questions : ($5 \times 1 = 5$)

6(i). The refrigerant used in a domestic refrigerator is which one among the following ?

- | | |
|--------------------------------|---------------|
| (A) Primary | (B) Secondary |
| (C) Both Primary and Secondary | (D) Air |

6(ii). Dinesh is a refrigeration mechanic. Once he was trying to install the starting relay in a domestic refrigerator in upside down condition. Suggest whether it will work or not.

- | | |
|-----------------------|------------------------|
| (A) Will not work | (B) Will work properly |
| (C) May work properly | (D) Can't say |

6(iii). The process performed by the window air-conditioner is "Cooling with dehumidification" of air. Which one is correct ?

- | | |
|--------------------|---------------|
| (A) No | (B) Yes |
| (C) May be correct | (D) Can't say |

6(iv). Which type of air-conditioning system used in shopping mall ?

- | | |
|-------------------------------|------------------------------|
| (A) Window air-conditioning | (B) Central air-conditioning |
| (C) Portable air-conditioning | (D) Hybrid air-conditioning |

6(v). The insulating material is most widely used in refrigerator is

- | | |
|----------------------|-----------|
| (A) Polystyrene foam | (B) Cloth |
| (C) Rubber | (D) Wax |

6(vi). All the foods which are used by the human beings are drawn from the plants and animals. To preserve them from spoilage, which one of the following application of refrigeration is used ?

- | | |
|-------------------------|----------------------|
| (A) Evaporative cooling | (B) Cold storages |
| (C) Ice plants | (D) Air-conditioning |

Section B

Answer any 3 questions out of the given 5 questions on Employability Skills in 20-30 words each : ($3 \times 2 = 6$)

7. Who is an Agricultural entrepreneur ? Briefly explain.

8. Write the steps to protect worksheet or calc documents using option of tools menu.

9. Define Consciousness.

10. Write down any two most common environmental barriers to an entrepreneur.

11. Write any two steps to overcome personality disorders.

Answer any 3 questions out of the given 5 questions in 20-30 words each : ($3 \times 2 = 6$)

12. What is Conduction ? Explain in brief.

13. What do you mean by “Cooling with dehumidification” of air ? Explain.

14. Make a list of components of refrigeration system used in an ice plant.

15. Write the name of any two secondary refrigerants.

16. The function of a fan is to produce air movements through heating, ventilating and air-conditioning apparatus. Write the names of any two types of fans used in air-conditioning system.

Answer any 2 questions out of the given 3 questions in 30-50 words each : ($2 \times 3 = 6$)

17. Write three desirable properties of an Ideal insulating material.

18. Explain the “Sensible heating” process of air with the help of a psychrometric chart.

19. Briefly explain Water Chillers.

Answer any 3 questions out of the given 5 questions in 50-80 words each : ($3 \times 4 = 12$)

20. Explain hot wire relay with a neat sketch.

21. Explain upward flow air distribution system with a neat sketch.

22. What is meant by a central air-conditioning system ? Make a list of equipments used in a central air-conditioning system.

23. Explain the working of a shell and coil type condenser with a neat sketch.

24. With the help of a line diagram, explain Dairy refrigeration.

- End of Question Paper -