



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.:

School of Refrigeration and Air-conditioning Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, III Semester,

1st In-Sem. Examination

Course Code: RAC1301

Time: 1 Hour

Course Name: Psychrometry & System Design

Max. Marks: 20

Section – A

05*01 = 05 Marks

Note: Each question carries 01 mark.

Q. 1: Which of the following is a unit of humidity ratio?

- A. gr/lb
B. g/kg
C. kg/kg
D. All of the above

Q. 2: Which of the following is not a psychrometric property?

- A. DBT
B. Entropy
C. WBT
D. Enthalpy

Q. 3: Air conditioning is :-

- A. Heating and humidification
B. Cooling and humidification
C. Cooling and Dehumidification
D. None of the above

Q. 4: WBT is _____ than DBT.

- A. More
B. Less
C. Equal
D. None of the above

Q. 5: What is the comfort value of RH?

- A. 40%
B. 50%
C. 60%
D. 90%

Section – B

03*02 = 06 Marks

Note: Each question carries 02 mark.

Q. 1: What is psychrometry? Explain

Q. 2: Explain the difference between DBT&WBT?

Q. 3: What is dew point temperature? Explain

Section – C

03*03 = 09 Marks



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Note: Each question carries 03 mark.

- Q. 1: What are Enthalpy and Relative humidity?
- Q. 2: What is Sensible heating and cooling?
- Q. 3: Explain humidity ratio and specific volume.



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Time: 1 Hour

Max. Marks: 20

Section – A

05*01 = 05 Marks

05 objective type questions, each question carries 01 mark.

- Q. 1: D
- Q. 2: B
- Q. 3: C
- Q. 4: B
- Q. 5: B

Section – B

03*02 = 06 Marks

3 short answer type questions, each question carries 02 marks.

1. Psychrometry is the study of the properties of moist air (mixtures of dry air and water vapor). To be able to analyze various processes involving moist air.
Example: if the air is warm and wet, what will be the air-conditioning design required
2. The temperature of the moist air as measured by a standard thermometer or other temperature measuring instruments. The temperature of the moist air as measured by a standard thermometer or other temperature measuring instruments.
3. The temperature at which condensation begins when the air is cooled at constant pressure.

Section – C

03*03 = 09 Marks

03 essay type questions, each question carries 03 marks.

1. The enthalpy of moist air is the sum of the enthalpy of the dry air (Sensible heat) and the enthalpy of the water vapor (Latent Heat).
Total Enthalpy = Sensible heat + Latent Heat



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2. A psychrometric process that involves the increase or decrease in the temperature of air without changing its humidity ratio. For example passing moist air over a room space heater and of kiln air over heating coils.

3. It is the mass of water associated with each kilogram of dry air , assuming both water vapor and dry air to be perfect gases. the number of cubic meters of moist air per kilogram of dry air.

Unit – m^3/kg of dry air

Used to calculate mass flow rate of air



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Registration No.:

School of Refrigeration & Air conditioning Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, III-Semester,

1st In-Sem. Examination

Course Code: RAC1302

Time: 1 Hour

Course Name: Central air-conditioning system practices

Max. Marks: 20

Instruction: Read the question carefully, do attempt all

Section – A

05*01 = 05 Marks

- Q1) What is Nacph _____?
- a. Number of air change per hour
 - b. Number of air condensed per hour
 - c. Number of person cfm per hour
 - d. Number of air cumulated per hour
- Q2) Which lines in psychrometry shows dry bulb
- a. Horizontal lines
 - b. vertical lines
 - c. Lines on curve left
 - d. enthalpy lines
- Q3) humidity ratio is defined by
- a. Grains/pound of dry air
 - b. gram/pound of dry air
 - c. gravitation/kg of dew point air
 - d. Number of air cumulated per hour
- Q4) Chart of psychrometry is study of _____ Air?
- a. Moist air
 - b. dry air
 - c. moisture at defined temperatures
 - d. pressure vs Enthalpy
- Q5) Ventilation through fan, blower is classified as
- a. Forced
 - b. draught
 - c. crossed
 - d. stacked

Section – B

03*02 = 06 Marks

Q1. Mark the Psychrometric points below?

S. No.	DBT (F)	WBT (F)	DPT (F)	% RH
1	70			40
2	75	65		

- Q2) What is ventilation. explain?
Q3) Draw a labelled diagram for Air scrubber

Section – C

03*03 = 09 Marks

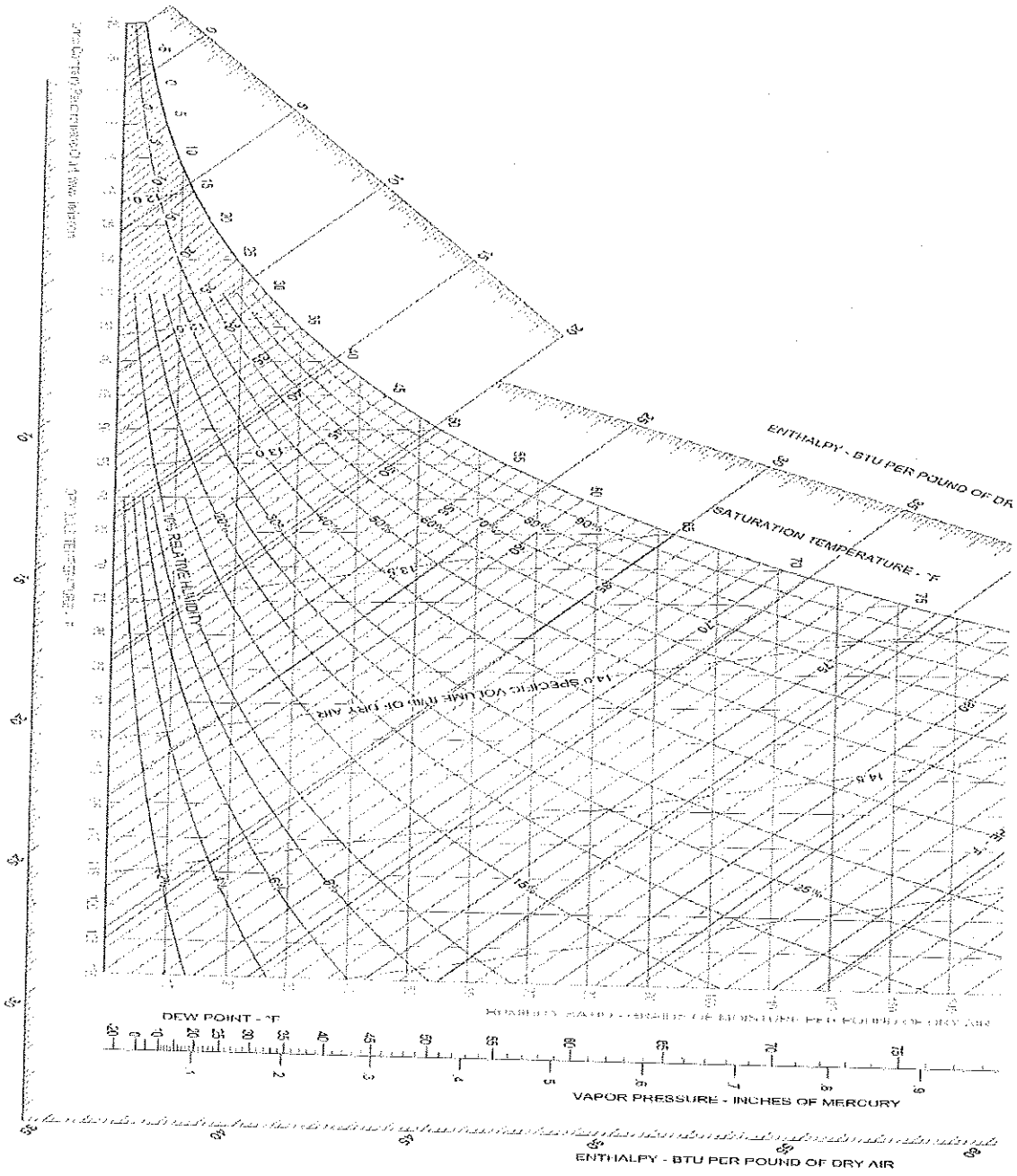
Q1) Types of ventilation used along with application?



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Q2) What is duct and its types

Q3) In a central Chiller plant Draw and explain the component with cycle?



Sheetan Jan



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Session: 2021-22 (Winter Semester)

B. Voc. Program, III-Semester,

1st In-Sem. Examination

Course Code: RAC1302

Time: 1 Hour

Course Name: Central air-conditioning system practices

Max. Marks: 20

Answer key

Section – A

05*01 = 05 Marks

- A1) a. Number of air change per hour
- A2) a. Horizontal lines
- A3) a. Moist air
- A4) c. moisture air
- A5) a. forced

Section – B

03*02 = 06 Marks

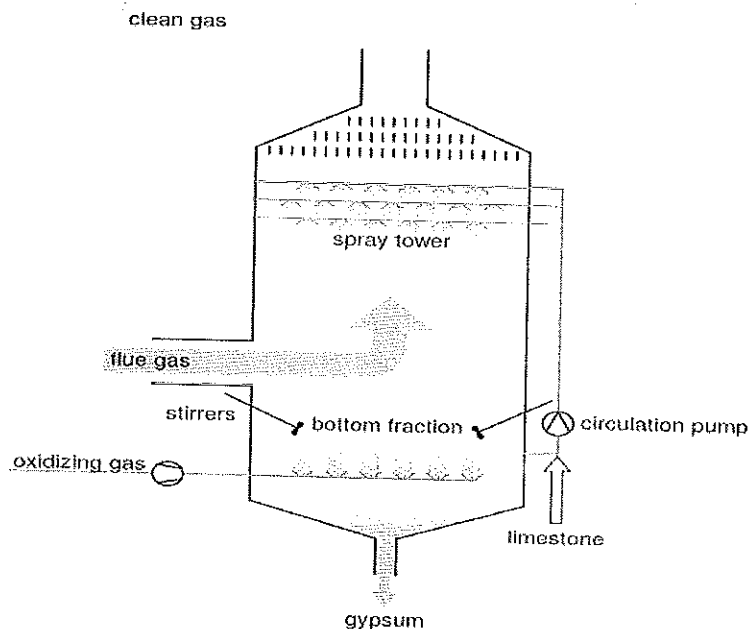
A 1.

s.no	DBT (F)	WBT (F)	DPT (F)	% RH
1	70	55.75	44.6	40
2	75	65	59.66	58.9

A2.

Ventilation is the Exchange of Room air with Fresh air. Sending Foul air out from the room/ space and supplying fresh air into the room/space. Ventilation is a vital requirement for the comfort and health of building occupants.

A3. Air scrubber



Q1) Types of ventilation used along with application?

A 1. Natural

- 1) single – side ventilation
- 2) cross flow ventilation
- 3) stack ventilation
- 4) Top - down ventilation

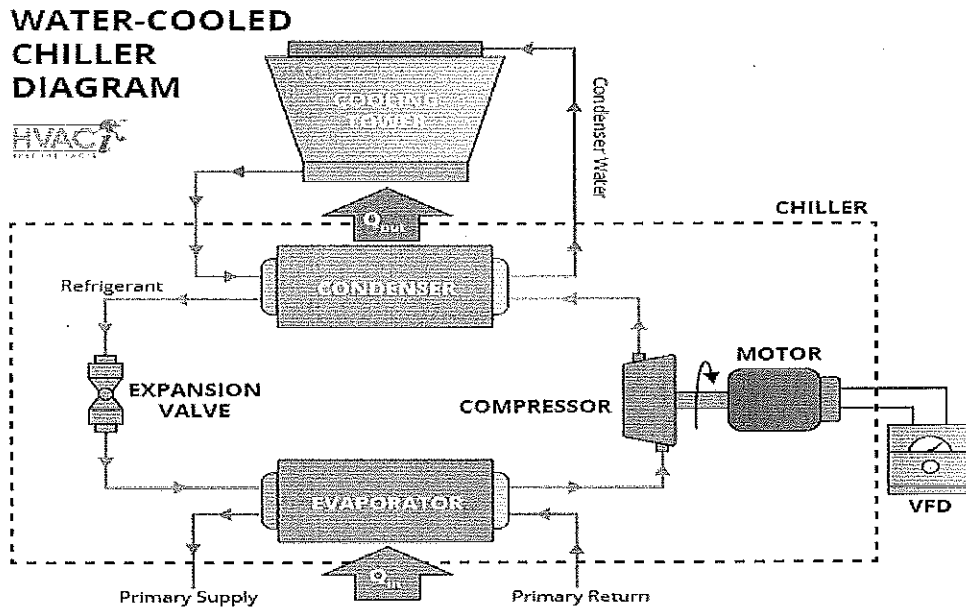
Artificial Forced

- 1) positive pressure
- 2) Horizontal Mechanical
- 3) Hydraulic

A2) Classify the duct based on

- 1) Shapes-round, square, rectangle, flat and oval
- 2) Velocity with range According to Duct velocity
 1. Low – up to 1500 FPM
 2. Medium -1500-2500 FPM
 3. High-2500-4500 FPM

A3)



Shah J. A.



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Registration No.:

School of RAC Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, 3rd Semester

1st In-Sem. Examination

Course Code: RAC1303

Time: 1 Hour

Course Name: RAC Electrical, Electronics & Instrumentation-II

Max. Marks: 20

Instruction: Attempt all questions

Section – A

05X01 = 05 Marks

1. A capacitor is a device that stores electrical energy in _____.
 - a. cylinder
 - b. magnetic field
 - c. electric field
 - d. electricity
2. A DC motor is any of a class of rotary electrical motors that converts direct current (DC) electrical energy into _____.
 - a. Potential energy
 - b. speed
 - c. energy
 - d. mechanical energy
3. A relay is an _____ operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals.
 - a. hand
 - b. electrically
 - c. mechanically
 - d. automatically
4. It is a type of split-phase induction motor in which the capacitor is permanently connected (as opposed to only being connected when starting).
 - a. RSIR
 - b. PSC
 - c. Shaded pole
 - d. CSIR
5. The production of _____ from magnetism is known as electromagnetic induction.
 - a. electricity
 - b. voltage
 - c. force



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d. Speed

Section – B

03X02 = 06 Marks

6. How does voltage relay work explain with diagram?
7. What are the various parts of an AC motor?
8. How to check the condition of the capacitor?

Section – C

03X03 = 09 Marks

1. Explain the fault-finding procedure of a compressor.
2. Explain the difference between AC and DC motors
3. Draw the wiring diagram of following motors
 - a. RSIR
 - b. CSR
 - c. PSC

Om
A



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Registration No.:

School of RAC Skills

Session: 2021-22 (Winter Semester)

B. Voc. Program, 3rd Semester

1st In-Sem. Examination

Course Code: RAC1303

Time: 1 Hour

Course Name: RAC Electrical, Electronics & Instrumentation-II

Max. Marks: 20

Instruction: Attempt all questions

Answer Sheet

Section – A

05X01 = 05 Marks

1. A capacitor is a device that stores electrical energy in _____.
 - a. cylinder
 - b. magnetic field
 - c. electric field**
 - d. electricity
2. A DC motor is any of a class of rotary electrical motors that converts direct current (DC) electrical energy into _____.
 - a. Potential energy
 - b. speed
 - c. energy
 - d. mechanical energy**
3. A relay is an _____operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals.
 - a. hand
 - b. electrically**
 - c. mechanically
 - d. automatically
4. It is a type of split-phase induction motor in which the capacitor is permanently connected (as opposed to only being connected when starting).
 - a. RSIR
 - b. PSC**
 - c. Shaded pole
 - d. CSIR
5. The production of _____ from magnetism is known as electromagnetic induction.



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- a. electricity
- b. voltage
- c. force
- d. Speed

Section – B

03X02 = 06 Marks

6. How does voltage relay work explain with diagram?

Potential relays also known as voltage relays are used in capacitor-start capacitor-run (CSR) motors. CSR motors have very high starting torque but run efficiently once started. ... Understanding how the voltage relay's connections and sequence of operation is important when diagnosing compressors that aren't starting.

7. What are the various parts of an AC motor?

The main components of an AC motor are the stator, stationary outer drum, and the rotor, the rotating inner portion attached to the motor shaft. The stator and the rotor produce rotating magnetic fields. The winding of the stator that creates the rotating field is created by alternating current.

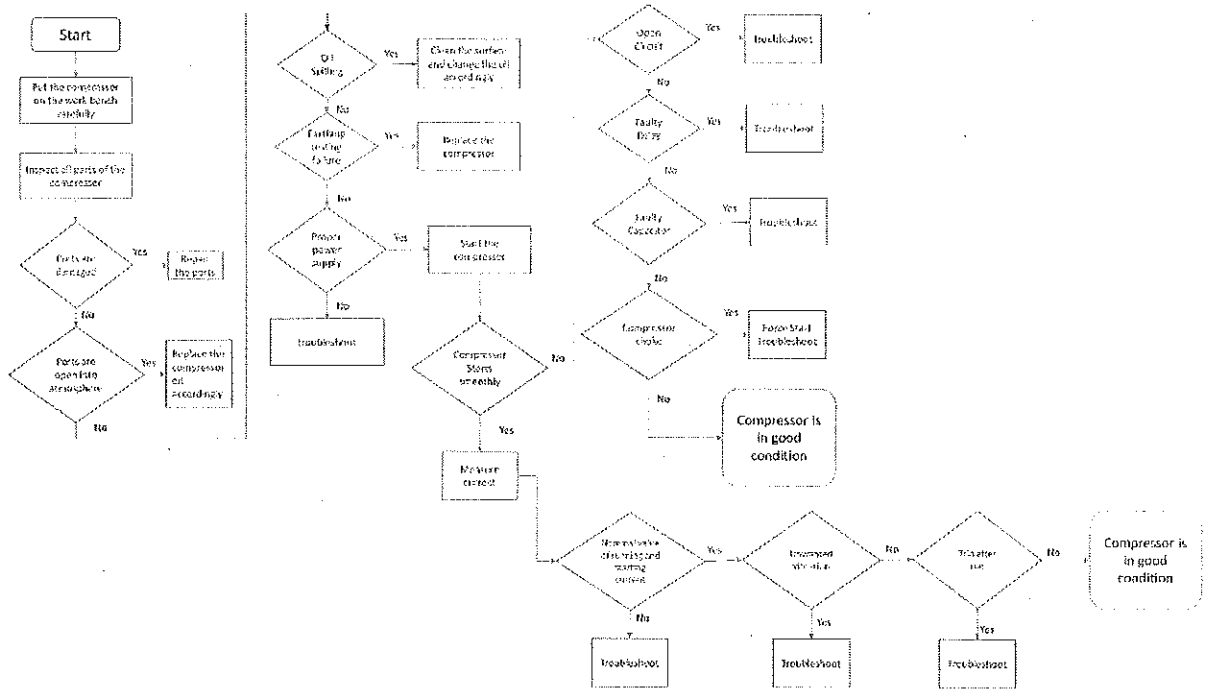
8. How to check the condition of the capacitor?

Connect the leads of the capacitor to the multimeter probes and observe the readings on the multimeter. For a good capacitor, the resistance will be low in the beginning and will gradually increase. If the resistance is low at all times, the capacitor is a Shorted Capacitor and we have to replace it

Section – C

03X03 = 09 Marks

1. Explain the fault-finding procedure of a compressor.

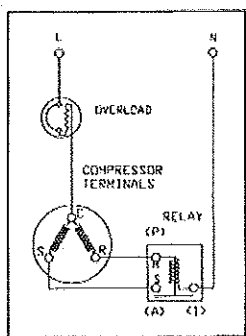


2. Explain the difference between AC and DC motors

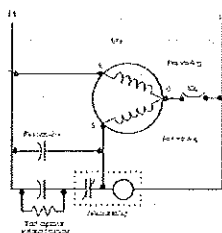
The most obvious difference is the type of current each motor turns into energy, alternating current in the case of AC motors, and direct current in the case of DC motors. AC motors are known for their increased power output and efficiency, while DC motors are prized for their speed control and output range.

3. Draw the wiring diagram of following motors

a. RSIR

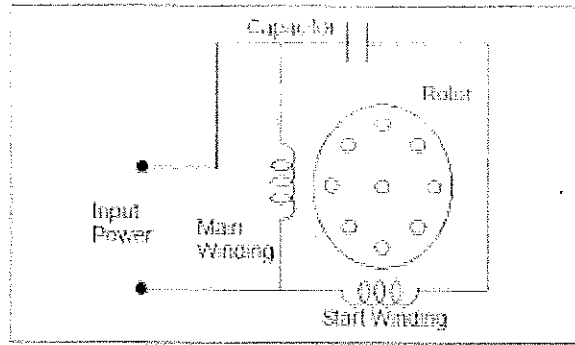


b. CSR



c. PSC

TYPICAL PSC MOTOR



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School of RAC Skills

III Semester, 1st In-Sem. Examination

B. Voc. Program, Winter Semester (2021-22)

Course Code: RAC1304

Time: 1 Hour

Course Name: Cold Chain & Cold Storage

Max. Marks: 20

Instruction:

1. Attempt all Questions.
2. Each question of Section – A carries 01 mark.
3. Each question of Section – B carries 02 mark.
4. Each question of Section – C carries 03 mark.

Section – A

05X01 = 05 Marks

1. Keeping in mind that texture changes take place after harvest, pulpy fruits become extremely hard after harvest.

- a. True
- b. False
- c. Mixed
- d. None of the above

2. After harvest, _____ of fruits and vegetables undergoes change.

- a. Texture, nutrients, minerals
- b. Color, minerals, nutrients
- c. Texture, minerals, nutrients
- d. None of the mentioned

3. Which of the following is true about fruits and vegetable processing?

- a. They get spoil very fast and hence need to be consumed soon
- b. They have high moisture content and should be kept in a cold, dark place
- c. They're tender and hence get spoiled easily
- d. All of the mentioned

4. Which of the following is not related to Post Harvest losses?

- a. Postharvest losses can be reduced by adding value to products
- b. Packaging, storage, transportation areas are where losses take place
- c. Farmers don't earn much after adding value to products
- d. Value can be added to products by converting raw form into a more processed/refined form



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5. Which of the following are Milk Processing Operations?

- a. Clarification
- b. Pasteurization
- c. Homogenization
- d. All of the mentioned

Section – B


03X02 = 06 Marks

1. Define the term food & food preservation.
2. Write down the importance of food preservation.
3. Write a short note on raking system.

Section – C

03X03 = 09 Marks

1. Explain the food preservation methods.
2. Write down the pre harvesting factors that affect the product quality.
3. Write down Pushback racking

~~At home~~
8/4/22


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School of RAC Skills

III Semester, 1st In-Sem. Examination

B. Voc. Program, Winter Semester (2021-22)

Course Code: RAC1304

Time: 1 Hour

Course Name: Cold Chain & Cold Storage

Max. Marks: 20

Section – A

05X01 = 05 Marks

1. Keeping in mind that texture changes take place after harvest, pulpy fruits become extremely hard after harvest.

b. False

2. After harvest, _____ of fruits and vegetables undergoes change.

a. Texture, nutrients, minerals

3. Which of the following is true about fruits and vegetable processing?

d. All of the mentioned

4. Which of the following is not related to Post Harvest losses?

c. Farmers don't earn much after adding value to products

5. Which of the following are Milk Processing Operations?

d. All of the mentioned

Section – B

03X02 = 06 Marks

1. Define the term food & food preservation.

A cold chain warehouse (or cold chain storage) is a specialized structure that's always closed off and insulated from its external environment, and where conditions inside are carefully controlled. Cold chain warehouses (often referred to as "cold storage" or "temperature controlled warehouses") are used to store perishables that are extremely sensitive and can spoil easily if not stored properly. Transportation in cold chains is carried out in cold boxes or refrigerated containers that accomplish EXACTLY what a cold chain warehouse's facilities do - guarantee that temperature-sensitive goods are maintained in conditions that guarantee their survival, whether in the warehouse or on the road.

A cool store or cold store is a large refrigerated room or building designed for storage of goods in an environment below the outdoor temperature. Products needing

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refrigeration include fruit, vegetables, seafood and meat. Cold stores are often located near shipping ports used for import/export of produce.

2. Write down the importance of food preservation.

The main reasons for food preservation are to overcome inappropriate planning in agriculture, produce value-added products, and provide variation in diet. The agricultural industry produces raw food materials in different sectors. Inadequate management or improper planning in agricultural production can be overcome by avoiding inappropriate areas, times, and amounts of raw food materials as well as by increasing storage life using simple methods of preservation. Value-added food products can give better-quality foods in terms of improved nutritional, functional, convenience, and sensory properties. Consumer demand for healthier and more convenient foods also affects the way food is preserved. Eating should be pleasurable to the consumer, and not boring. particularly in underdeveloped countries to reduce reliance on a specific type of grain (i.e., rice or wheat).

3. Write a short note on racking system.

wide-aisle static adjustable pallet racking (APR): counter-balance truck operation

narrow-aisle adjustable pallet racking (NAPR): reach truck operation

very-narrow-aisle adjustable pallet racking (VNAPR): turret truck operation.

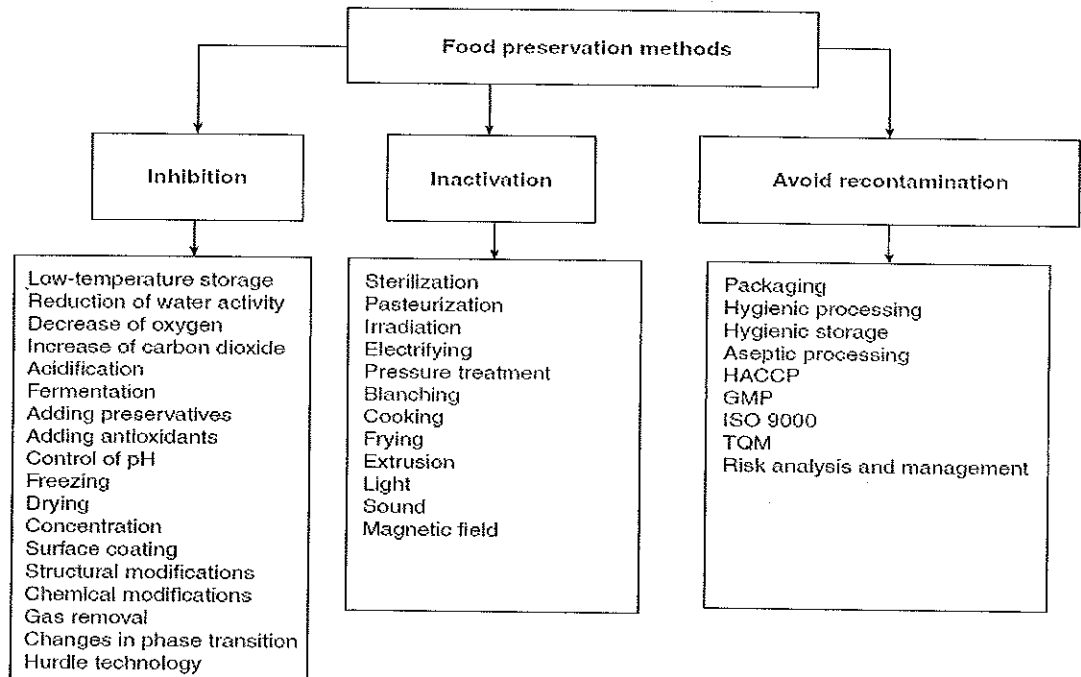
drive-in/drive-through pallet racking

Section – C

03X03 = 09 Marks

1. Explain the food preservation methods.

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2. Write down the pre harvesting factors that affect the product quality.

Answer: Genetic

Genetic makeup has a profound effect on the selection of a raw material for a given processing application. Cultivar and rootstock selection influence the composition, quality, storage potential, and response to processing characteristics that may be inherited.

Climatic

The growing region and environmental conditions specific to each region, such as temperature, humidity, light, wind, soil texture, elevation, and rainfall, significantly influence the quality of fruits and vegetables.

Cultural Practices

Soil type, soil nutrient and water supply, pruning, thinning, pest control or chemical spray, and density of planting influence the quality of plant produce.

3. Write down Pushback racking

Last in, first out (LIFO): These are relatively new systems on the market that have the same basic structure as the live storage system. Pallets are placed either on rollers, guides, chains or platens and pushed away from the input face by the next pallet. There are two basic systems: gravity roll forward (up to four deep) and mechanically brought forward (up to 12 deep). Because the pushing force is provided by the handling equipment, there is a limitation on the depth of the system. If a reach truck is used it will probably be limited to three or four levels and no more than four deep. A counterbalance truck is likely to have the increased stability to work a mechanically brought-forward system. Cost indications, building heights and handling equipment are the same as the FIFO system. However, there is a floor-space saving as a common access gangway serves for both input and output operations.

