



Set - B

Registration No.:

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of RAC Skills

1st Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2019-20)

Course Code: HVA-1101

Course Name: Basic of Refrigeration and Air-Conditioning

Instruction: Attempt all questions.

Time: 1 Hour

Max. Marks: 20

Section – A

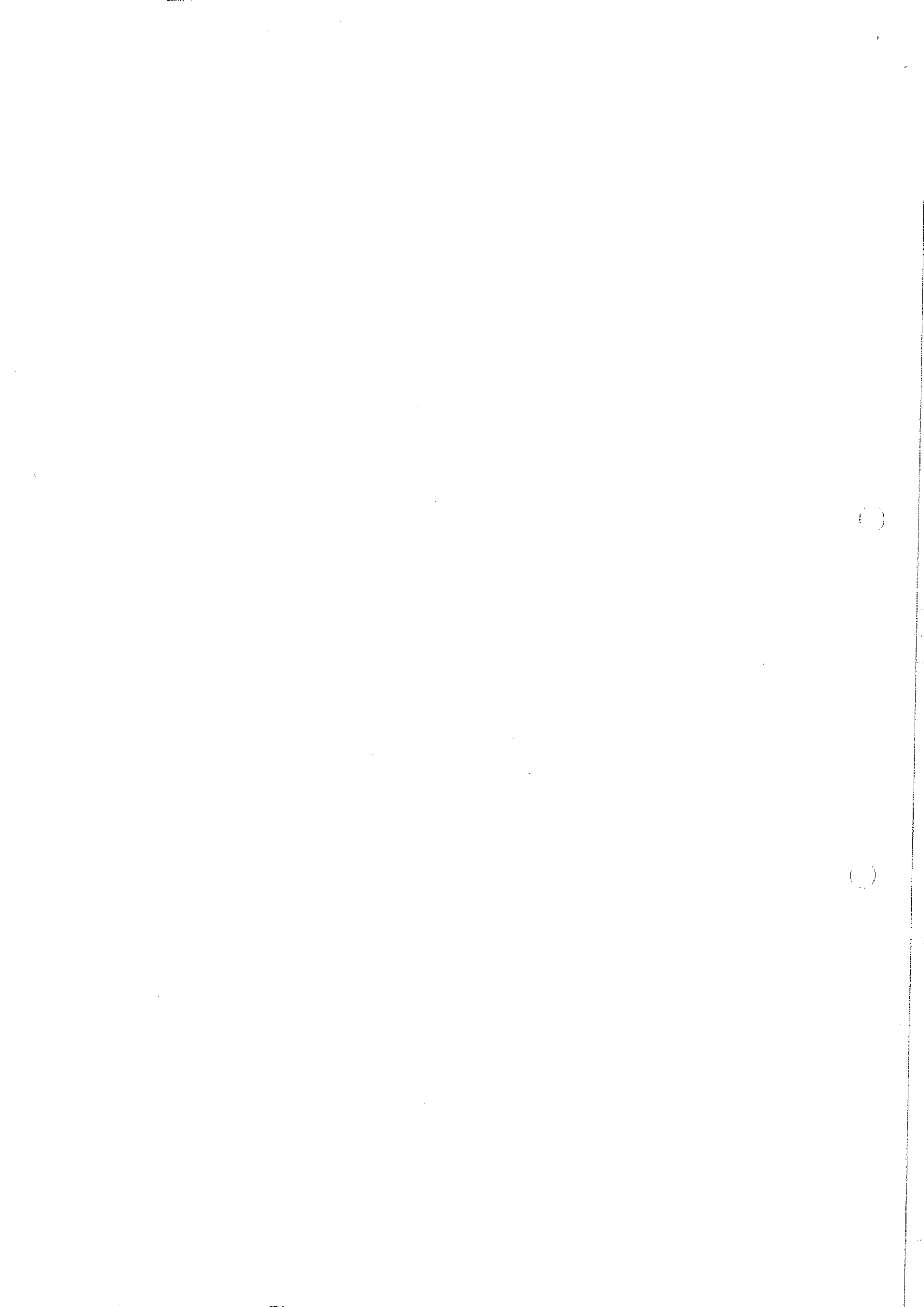
05X01 = 05 Marks

1. In one inch how many millimeters?
 - a) 25.4 millimeter
 - b) 2.54 millimeter
 - c) 250 millimeter
 - d) 0.25 millimeter
2. Convert 200 degree Celsius into Fahrenheit:
 - a) 392
 - b) 2.12
 - c) 21.2
 - d) 0.21
3. Which property remain constant during constant pressure process?
 - a) Temperature
 - b) Pressure
 - c) Volume
 - d) Enthalpy
4. What is the unit of temperature?
 - a) Degree Celsius
 - b) Kelvin
 - c) Fahrenheit
 - d) All of above
5. What is the condition for thermodynamic equilibrium?
 - a) Thermal equilibrium
 - b) Mechanical equilibrium
 - c) Chemical equilibrium
 - d) All of the above

Section – B

03X02 = 06 Marks

1. What is flow work? Derive expression of flow work for an open system.
2. Derive expression for work done by closed system.
3. Explain thermodynamics process and cycle with neat sketch.





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Section – C

03X03 = 09 Marks

1. Derive expression for steady flow energy equation.
2. What are the types of energy used in thermodynamics system? Explain in detail.
3. If a system undergoes various types of work interaction and heat interaction which are as followings:

$$W_1 = +60\text{KJ}, W_2 = -50\text{KJ}, Q_1 = -25\text{KJ}, Q_2 = 45\text{KJ}$$

Calculate change in total energy of a system.

Prepared by

V. V. V.

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School of RAC Skills

1st Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2019-20)

Course Code: HVA-1101

Time: 1 Hour

Course Name: Basic of Refrigeration and Air-Conditioning

Max. Marks: 20

Instruction: (Attempt all questions.)

Section A

- 1) a
- 2) a
- 3) b
- 4) d
- 5) d

Short answer: Section B

- 1) Work is needed to push the fluid into or out of the boundaries of a control volume if mass flow is involved. This work is called the flow work (flow energy). Flow work is necessary for maintaining a continuous flow through a control volume. Flow work = PV
- 2) Closed system work done = PdV .
Force it is defined multiply by perpendicular distance is called work.
Power it is defined as rate of doing work
- 3) The succession of change of state from one equilibrium position to another equilibrium position is called process.
When initial and final state coincide called cycle.

Long answer question Section C

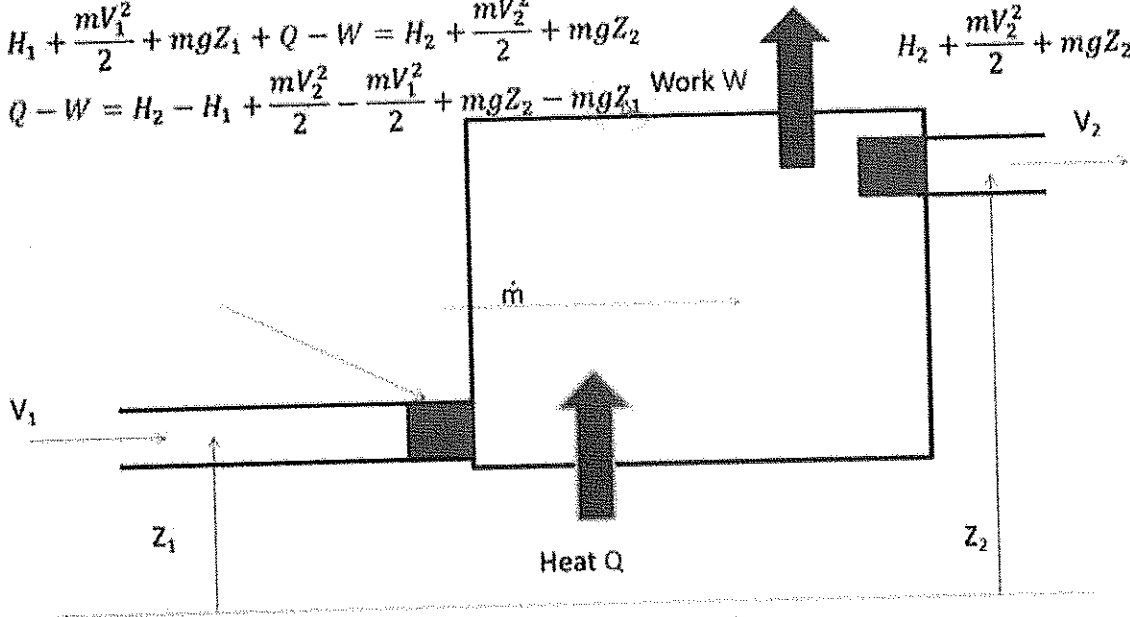
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Steady Flow Energy Equation

$$H_1 + \frac{mV_1^2}{2} + mgZ_1 + Q - W = H_2 + \frac{mV_2^2}{2} + mgZ_2$$

$$Q - W = H_2 - H_1 + \frac{mV_2^2}{2} - \frac{mV_1^2}{2} + mgZ_2 - mgZ_1$$



$$H_1 + \frac{mV_1^2}{2} + mgZ_1 + Q - W$$

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- 2) Energy = energy in transit and energy in stored, transit energy is work transfer and heat transfer. Stored energy is internal energy, kinetic energy and potential energy.
- 3) $Q - W = dE$
 $25 - 45 - 60 + 50 = dE$
 $20 - 10 = dE$
 $10 = dE$

Prepared by
Wp



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.:

School of RAC Skills

Session: 2019-20 (Summer Semester)

B. Voc. Program, 1st Semester,

1st In-Sem. Examination

Course Code: HVA1102

Course Name: Installation and Assembly of Refrigerator

Time: 1 Hour

Max. Marks: 20

Section – A

05X01 = 05 Marks

1. In VCR system, highest temperature occurs at which point?
 - a) Inlet of expansion valve
 - b) suction of compressor
 - c) inlet of condenser
 - d) inlet of evaporator
2. Which joint is a permanent joint?
 - a) Flaring
 - b) Swaging
 - c) Brazing
 - d) Nut and bolt
3. Which one is function of compressor?
 - a) increase pressure of system
 - b) Removes heat from system
 - b) Converts refrigerant into Vapour
 - d) lowers pressure of system
4. Which compressor type does have valves?
 - a) Reciprocating
 - b) Centrifugal
 - c) Screw
 - d) swing
5. An Ice candy plant is example of?
 - a) Domestic Refrigeration
 - b) Industrial refrigeration
 - c) Rejects Heat of Room
 - d) Submarine and transportation

Section – B

03X02 = 06 Marks

1. Differentiate between natural cooling and refrigeration process.
2. What are the applications of refrigeration in industries?
3. Explain functions of evaporator and expansion valve.

Section – C

03X03 = 09 Marks

1. Explain VCR cycle in context of refrigerator.
2. Write a note on history of natural cooling methods.

Prepared By

Devendra



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Answer Sheet(ii)

Installation and Assembly of refrigerator

Section A

Answer 1 (c)

Answer 2 (c)

Answer 3 (a)

Answer 4 (a)

Answer 5 (b)

Section B

Answer 1

Cooling

A process by which a body loses heat to its surroundings or ambient. It involves a heat transfer process by conduction, convection and radiation, since heat transfer is always associated which flow of heat from a higher temperature to lower temperature.

Refrigeration

The process by which temperature of a body is maintained lower than its surroundings. Heat is pumped from a body at lower temperature to a body at higher temperature. So, we need a external power source to run system.

Answer 2

The division between these two areas is not clearly defined. As a general rule, industrial applications are larger in size than commercial applications and have the distinguishing feature of requiring an attendant on duty, usually a licensed operating engineer. Typical industrial applications are ice plants, large food-packing plants (meat, fish, poultry, frozen foods, etc.), breweries, creameries, and industrial plants, such as oil refineries, chemical plants, rubber plants, etc. Industrial refrigeration includes also those applications that are concerned with the construction industry.

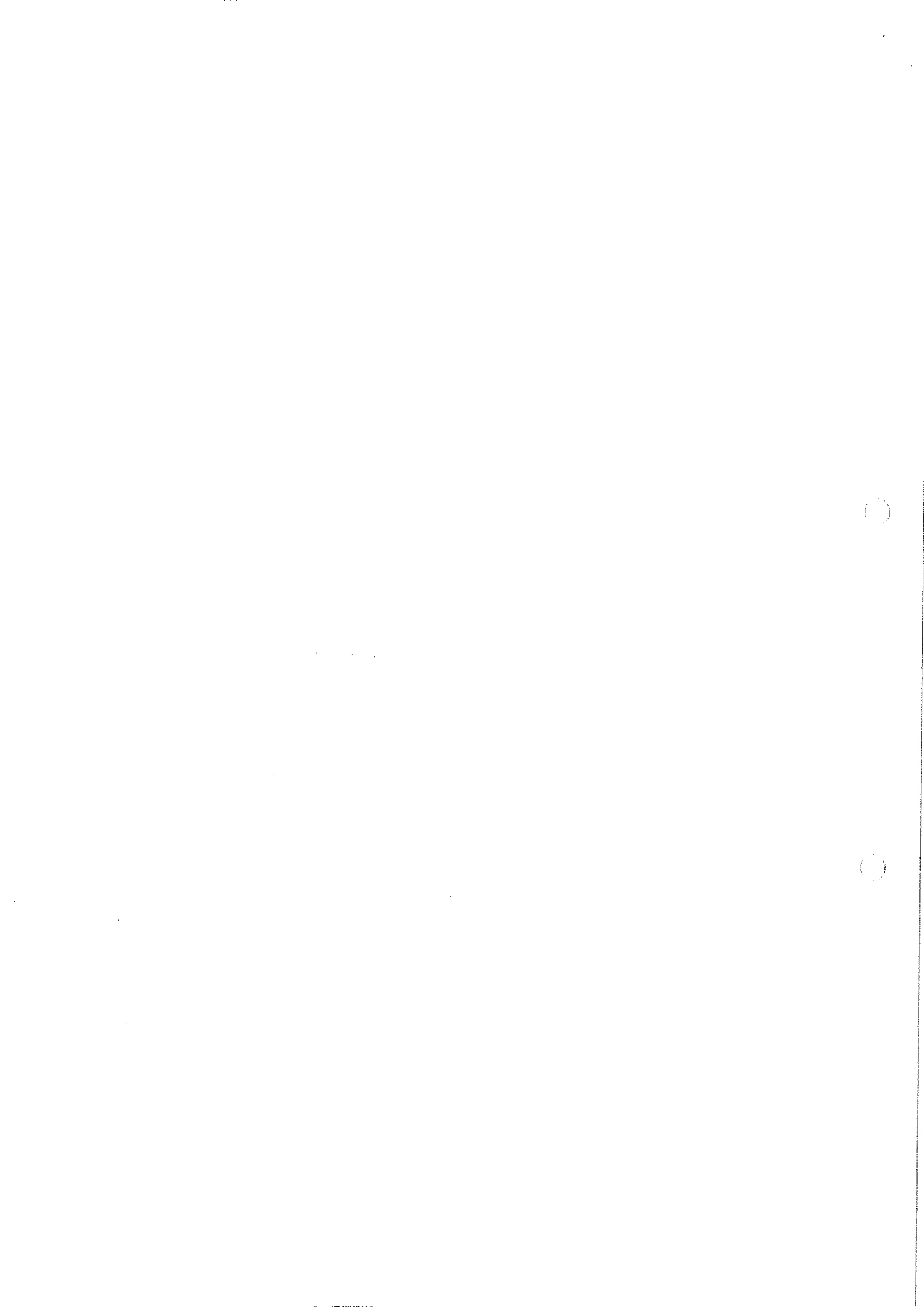
Answer 3

Evaporator

It is heat exchanger. It exchanges heat with room (cooling required space). Evaporator has main two types first in water cooled and another is air cooled.

At the outlet of evaporator refrigerant changes into vapor. This vapor goes into compressor and repeat cycle.

Expansion Valve



It is a very small diameter pipe, due to pipe friction it lowers pressure of system. There is a large drop in pressure that cause a large drop in temperature, after it refrigerant goes into evaporator for heat exchange. It works just opposite of compressor.

Section C

Answer 1

Vapour Compression Refrigeration Cycle

This refrigeration cycle is a reverse Carnot cycle run in reverse. A working fluid (*refrigerant*) is run through the system and undergoes state changes (from liquid to gas and back). The latent heat of vaporization of the refrigerant is used to transfer large amounts of heat energy, and changes in pressure are used to control when the refrigerant expels or absorbs heat energy.

Compressor

Refrigerant enters the compressor as a gas under low pressure and having a low temperature. Then, the refrigerant is compressed adiabatically, so the fluid leaves the compressor under high pressure and with a high temperature.

Condenser

The high pressure, high temperature gas releases heat energy and condenses inside the condenser. The condenser is in contact with the hot reservoir of the refrigeration system. The refrigerant leaves as a high pressure liquid.

Expansion Valve

The liquid refrigerant is pushed through a expansion valve, which causes it to expand. As a result, the refrigerant now has low pressure and lower temperature, while still in the liquid phase.

Evaporator

The low pressure, low temperature refrigerant enters the evaporator, which is in contact with the cold reservoir. Because a low pressure is maintained, the refrigerant is able to boil at a low temperature. So, the liquid absorbs heat from the cold reservoir and evaporates. The refrigerant leaves the evaporator as a low temperature, low pressure gas and is taken into the compressor again, back at the beginning of the cycle.

Answer 2

Natural

In earlier times, ice was either:

1. Transported from colder regions,
2. Harvested in winter and stored in ice houses for summer use or,



3. Made during night by cooling of water by radiation to stratosphere.

In America, Iran and in many other countries icehouses were built, sawdust and wood shaving were used as insulating material later on cork invented as a new insulating material. Later on trade of cutting ice from river and sell in market become a popular trade.

Ice by nocturnal cooling

Ice by nocturnal cooling was perfected in India. In this method ice was made by keeping a thin layer of water in a shallow earthen tray, and then exposing the tray to the night sky.

Compacted hay of about 0.3 m thickness was used as insulation. The water loses heat by radiation to the stratosphere, and by early morning hours the water in the trays freezes to ice. This method of ice production was very popular in India.

Evaporative Cooling:

As the name indicates, evaporative cooling is the process of reducing the temperature of a system by evaporation of water. Human beings dissipate their metabolic heat by evaporative cooling if the ambient temperature is more than skin temperature.

Cooling by earthen vessel

Evaporative cooling has been used in India for centuries to obtain cold water in summer by storing the water in earthen pots. The water permeates through the pores of earthen vessel to its outer surface where it evaporates to the surrounding, absorbing its latent heat in part from the vessel, which cools the water.

Cooling by Ice and salt solution

Certain substances such as common salt, when added to water dissolve in water and absorb its heat of solution from water (endothermic process). This reduces the temperature of the solution (water+salt). Sodium Chloride salt (NaCl) can yield temperatures up to -20°C and Calcium Chloride (CaCl_2) up to -50°C in properly insulated containers. However, as it is this process has limited application, as the dissolved salt has to be recovered from its solution by heating.





BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of RAC Skills

I Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2019-20)

Course Code: HVA1103

Course Name: Assembly & Installation of AC

Time: 1 Hour

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. Which type of instrument a Vernier caliper is?

- a. Measuring
- b. Gauging
- c. Both
- d. None of the above

2. Which type of instrument a Try square is?

- a. Measuring
- b. Gauging
- c. Both
- d. None of the above

3. Value of 35 micron in Millimeter (mm) is:

- a. 35 mm
- b. 350 mm
- c. 3.5 mm
- d. None of the above

4. By which component, pressure reduction is done in your room AC?

- a. Compressor
- b. Condenser
- c. Expansion device
- d. None of the above





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5. Heat addition to refrigerant take place in:

- A. Compressor
- B. Evaporator
- C. Both A & B
- D. None of the above

Section – B

03X02 = 06 Marks

1. Write down the classification of inspection system with a neat sketch.
2. You have a Vernier caliper of least count 0.02 mm. Minimum measurable value on main scale is 1 mm. Find out the total number of divisions on secondary scale.
3. Why the size of Condenser is always greater than all other basic components in your room AC?

Section – C

03X03 = 09 Marks

1. Enlist the safety requirement during the AC maintenance work in detail.
2. Give the name of all the parts of a Vernier caliper with the help of a neat sketch.
3. Describe the change in the state of refrigerant that take place in an air conditioning cycle through a neat sketch cycle.

Prepared by
~~Ally~~

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Registration No.:

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of RAC Skills

I Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2019-20)

Course Code: HVA1103

Time: 1 Hour

Course Name: Assembly & Installation of AC

Max. Marks: 20

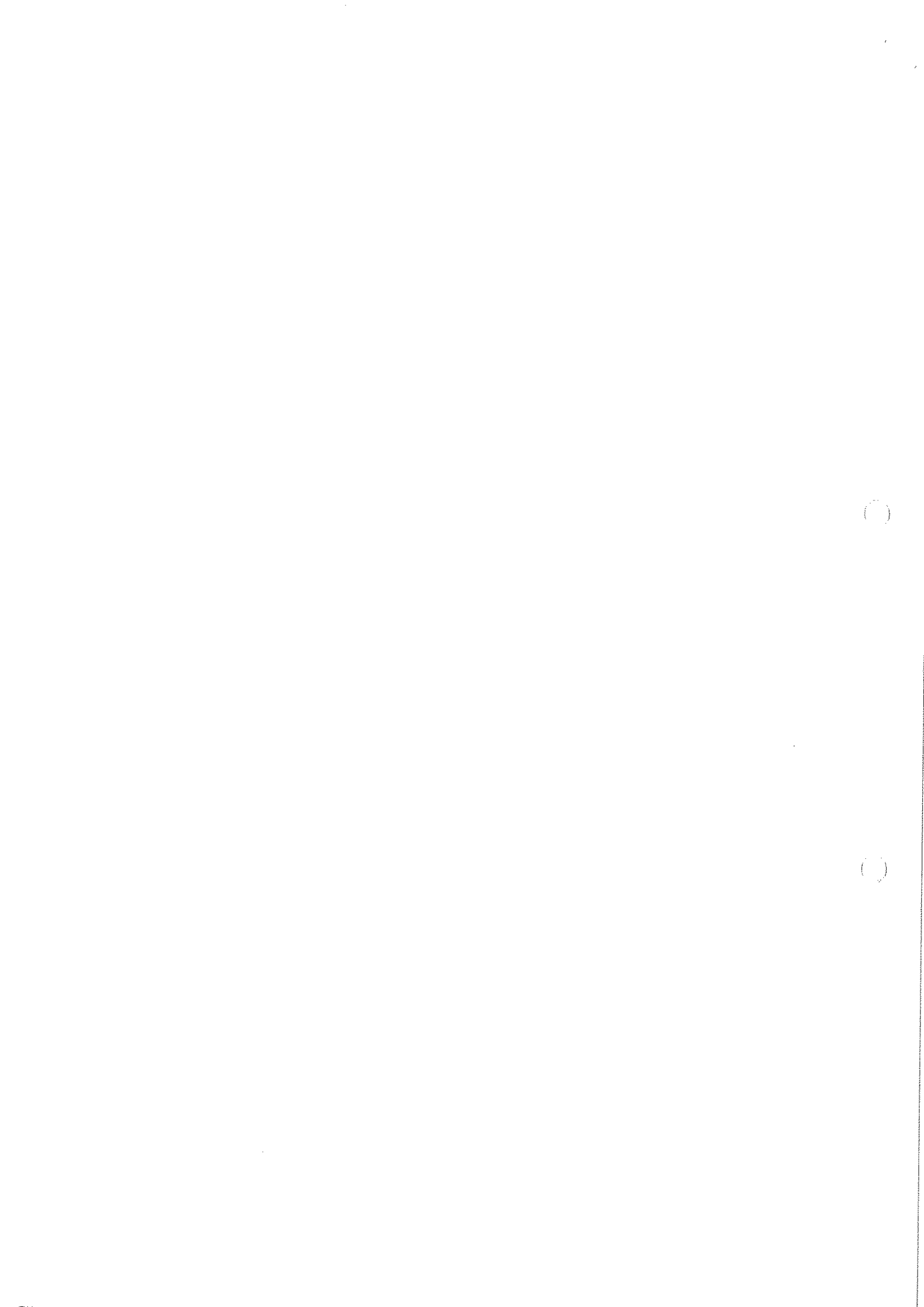
Instruction:

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. Which type of instrument a Vernier caliper is?
 - a. Measuring
2. Which type of instrument a Try square is?
 - b. Gauging
3. Value of 35 micron in Millimeter (mm) is:
 - d. None of the above
4. By which component, pressure reduction is done in your room AC?
 - c. Expansion device
5. Heat addition to refrigerant take place in:
 - c. Both A & B

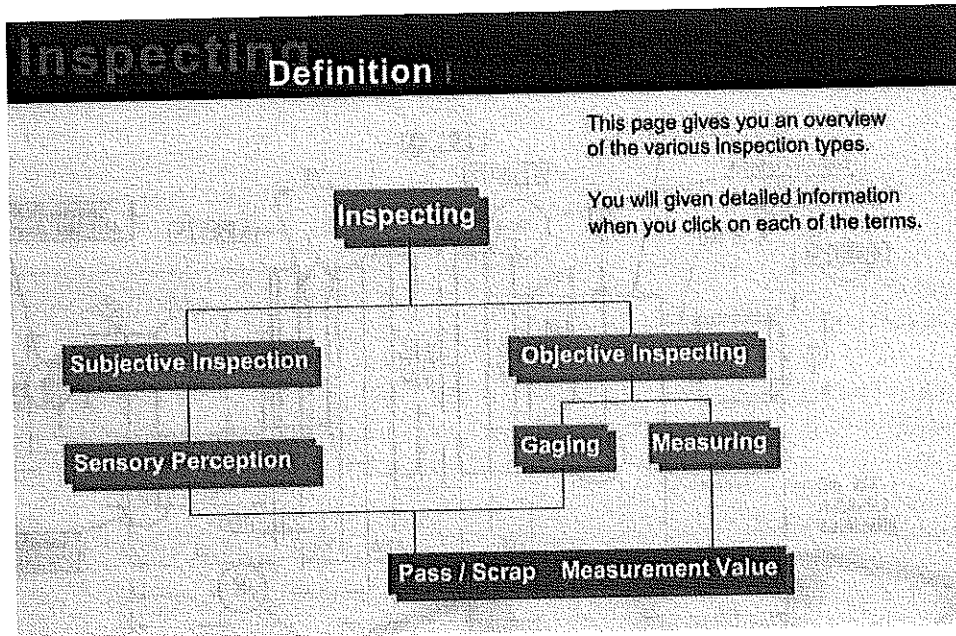


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Section – B

03X02 = 06 Marks

1. Write down the classification of inspection system with a neat sketch.



2. You have a Vernier caliper of least count 0.02 mm. Minimum measurable value on main scale is 1 mm. Find out the total number of divisions on secondary scale.

$$\text{Least count } (0.02) = 1/X$$

$$X = 50 \text{ Ans.}$$

3. Why the size of Condenser is always greater than all other basic components in your room AC?

$$\text{Heat rejected by the condenser} = \text{Heat addition by the (Evaporator + Compressor)}$$

Section – C

03X03 = 09 Marks

1. Enlist the safety requirement during the AC maintenance work in detail.

Personal safety

Mechanical safety

Electrical safety

High pressure gas safety

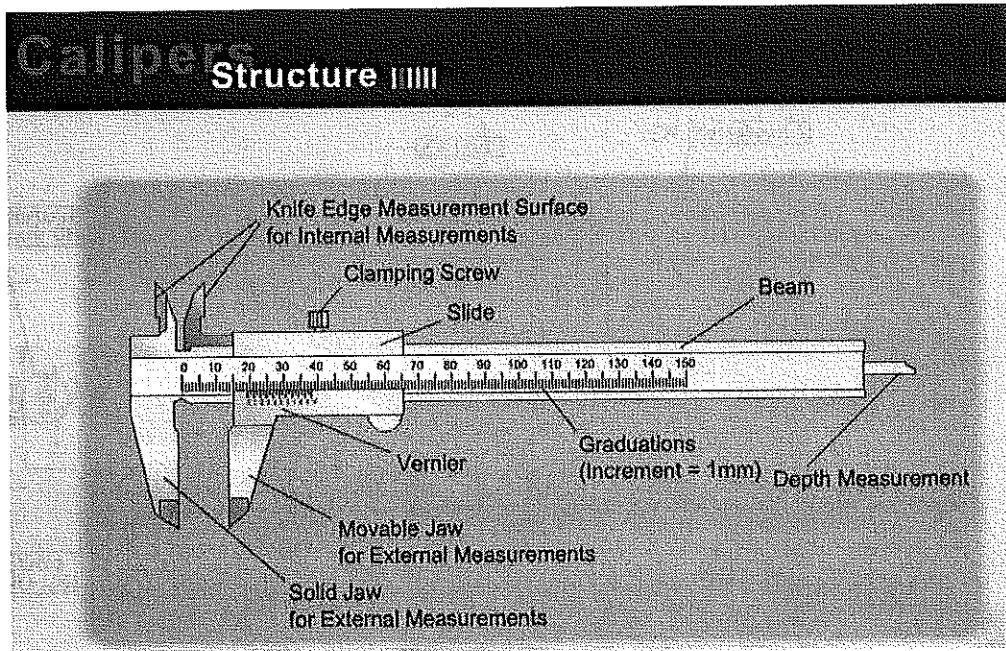
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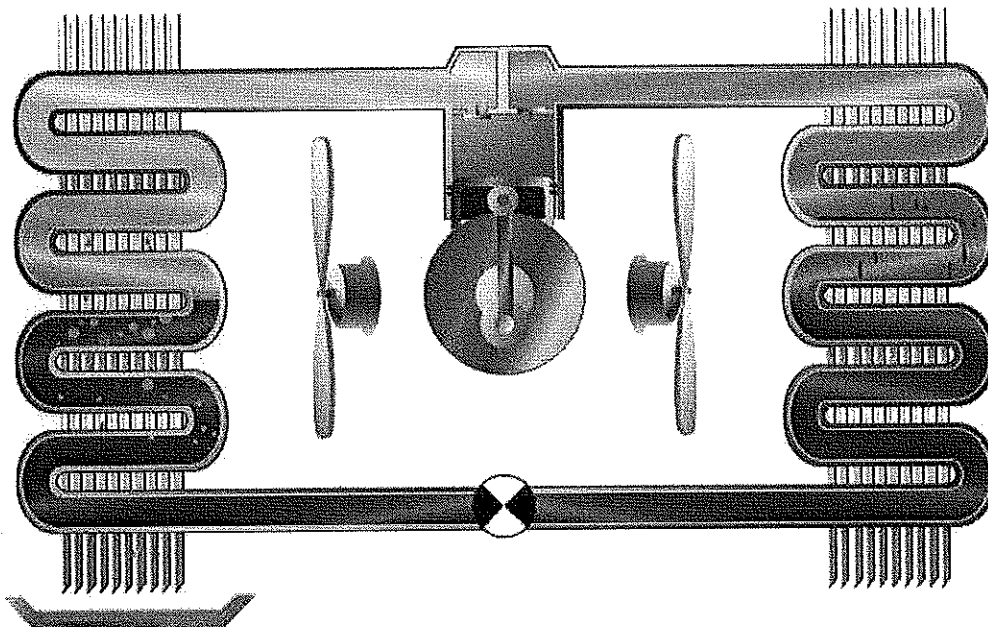
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2. Give the name of all the parts of a Vernier caliper with the help of a neat sketch.

3.



Describe the change in the state of refrigerant that take place in an air conditioning cycle through a neat sketch cycle.



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<u>Component</u>	<u>Inlet</u>	<u>Outlet</u>
Compressor	Vapour	Vapour
Condenser	Vapour	Liquid
Expansion device	Liquid	Liquid
Evaporator	Liquid	Vapour

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Registration No.:

School of HVAC&R Skills

Session: 2019-20 (Summer / Winter Semester)

B. Voc. 1st Semester,

1st In-Sem. Examination

Course Code: HVA-1104

Time: 1 Hour

Course Name: Sheet Metal & Welding

Max. Marks: 20

Instruction: Attempt all questions.

Section – A

05X01 = 05 Marks

1. Which of the following is not an unit of length measurement?
a) meter b) inch c) gram d) foot
2. How many foot are there in 168 in?
a) 13 b) 15 c) 16 d) None of the above
3. Melting point of aluminum is –
a) 700
b) 658
c) 600
d) 1000.
4. Cast iron is:
a) Difficult to weld
b) Easy to weld
c) No weldability
d) None of these
5. Tri-square is used for:
a) Cutting the sheet metal
b) Bending the sheet metal
c) To measure and layout lines on sheet metal
d) To layout circles

Section – B

03X02 = 06 Marks

1. What is strength? Explain with an example.
2. What are the different types of joints used in sheet metal?
3. What is the difference between a hammer and a mallet?

Section – C

03X03 = 09 Marks

1. What are ferrous Metals? Explain with different examples.
2. What are the different types of carbon steel?
3. Write about zinc and its properties and its application in sheet metal.

Prepared by:- Shyam Shand
Shandya
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Registration No.:

School of HVAC&R Skills

Session: 2019-20 (Summer / Winter Semester)

B. Voc. 1st Semester,

1st In-Sem. Examination

Course Code: HVA-1104

Time: 1 Hour

Course Name: Sheet Metal & Welding

Max. Marks: 20

Answer Key

Section – A

05X01 = 05 Marks

1. c
2. d
3. b
4. a
5. c

Section – B

03X02 = 06 Marks

1. The strength of a material is its ability to withstand an applied load without failure or plastic deformation. The field of strength of materials deals with forces and deformations that result from their acting on a material.
2. Permanent Joint:
 - a. Welding
 - b. Brazing
 - c. SolderingTemporary Joint
 - a. Bush pin
 - b. Riveting
 - c. Knuckle Joint
3. Hammers are primarily used for flattening the metal. Mallets on the other hand are also used like hammers to shape metal. However, they are less likely to mar metal surfaces because they are softer.

Section – C

03X03 = 09 Marks

1. Ferrous metals are those metals which have high amount of carbon. Some examples of ferrous metals are:
 1. Cast Iron :- It is used for the heavy parts of many machines and to make castings. It contains 2-4 percent of carbon. Cast iron is brittle and is difficult to weld

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2. Wrought Iron :- It is almost pure iron. It contains less percent of carbon. Wrought iron can be easily bent and welded.

3. Alloy Steel :- It has special properties which are determined by the mixture and the amount of other elements added.

- Nickel is added to increase strength, toughness and resist corrosion.
- Chromium adds hardness, toughness and resistance to wear.
- Manganese is used in steel to produce a clean metal and add strength to steel.

2. Carbon steel:- They are classified by the amount of carbon they contain.

Low Carbon Steel Or Mild Steel.

- It is often called mild steel or soft steel.
- It contains 0.1 to 0.3 percent carbon.
- This type of steel can be easily welded, machined and formed.

Medium Carbon Steel

- It contains 0.3 to 0.6 percent carbon.
- This type of steel is majorly used for standard machine parts.

High carbon Steel

- It contains 0.6 to 1.7 percent carbon.
- This type of steel is majorly used for making cutting tools such as chisels, files and scribers.

3. Zinc:

It's bluish white grey in color.

It's brittle at ordinary temperature.

Its melting point is 420 degree Celsius

It is malleable and ductile between 100 to 150 degrees

It's a good conductor of heat and electricity

Uses :-Galvanizing on iron sheets, forms a number of alloys etc

**BHARTIYA SKILL DEVELOPMENT UNIVERSITY**

School of Electrical Skills
Session: 2019-20 (Summer Semester)
B. Voc. Program, 1st Semester,
1st In-Sem. Examination

Course Code: HVA1105

Time: 1 Hour

Course Name: RAC Electricals




Max. Marks: 20

Instruction: Answer all questions from section A, each question carries one mark. Answer all questions from section B, each question carries two marks. Answer all questions from section C, each question carries three marks. Scientific calculator is allowed.

Section – A

05X01 = 05 Marks

Q.1. The symbol of resistor is:

- (a)  (b)  (c)  (d) None of these

Q.2. The unit of power is:

- (a) W (b) Wh (c) A (d) V

Q.3. Rate of flow of electric charge in an electric circuit is known as:

- (a) Voltage (b) Current (c) power (d) Energy

Q.4. The mass of neutron iselectron.

- (a) less than (b) greater than (c) equal to (d) none of these

Q.5. In an atom particles having positive charge is called:

- (a) Proton (b) Neutron (c) Electron (d) None of these

Section – B

03X02 = 06 Marks

Q.1. What do you mean by Electric Power?

Q.2. What do you mean by a resistance?

Q.3. Briefly define Electricity?

Section – C

03X03 = 09 Marks

Q.1. State and explain Kirchhoff's Voltage Law.

Q.2. State and explain Ohms law.

Q.3. Complete the following table for a circuit consisting of a voltage source connected in series with a resistance?

	Voltage (V)	Current (A)	Power (w)	Resistance (ohm)
1.	100			1000
2.	500	20		
3.		10	1000	



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Electrical Skills
Session: 2019-20 (Summer Semester)
B. Voc. Program, 1st Semester,
1st In-Sem. Examination

Course Code: HVA1105

Time: 1 Hour

Course Name: RAC Electricals

Max. Marks: 20

Section – A

05X01 = 05 Marks

1. Ans. (a)
2. Ans. (c)
3. Ans. (c)
4. Ans. (b)
5. Ans. (a)

Section – B

03X02 = 06 Marks

1. What do you mean by Electric Power?

Ans. Electric power is the rate of energy consumption in an electrical circuit.

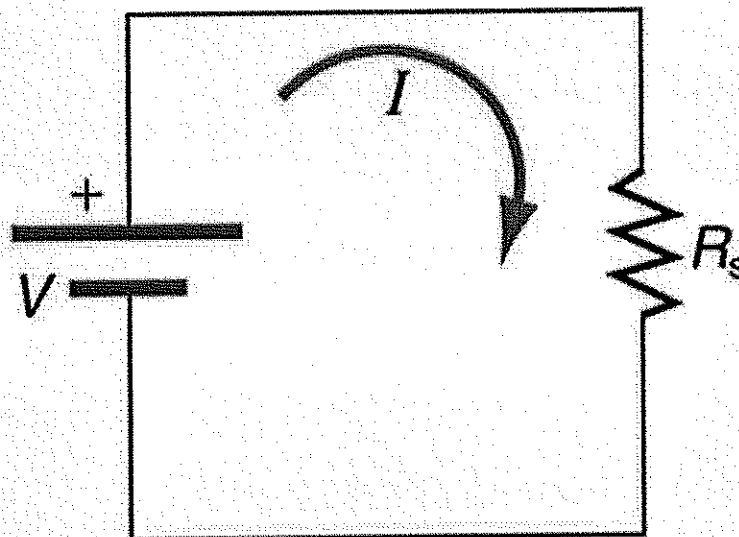
Electric power is the rate at which energy is transferred to or from a part of an electric circuit

The electric power is measured in units of watts.

General form:

electric power = Potential difference x current

$$P = VI$$



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2. What do you mean by a resistance?

Ans.

- Resistance is the 'opposition' to the current flow measured in ohms (Ω)
- Conductors have a low value of resistance
- Insulators have a very high resistance
- Load in DC/AC circuits

3. Briefly define Electricity.

Ans. Electricity is a form of energy. Electricity is the flow of electrons. All matter is made up of atoms, and an atom has a center, called a nucleus. The nucleus contains positively charged particles called protons and uncharged particles called neutrons. The nucleus of an atom is surrounded by negatively charged particles called electrons. The negative charge of an electron is equal to the positive charge of a proton, and the number of electrons in an atom is usually equal to the number of protons. When the balancing force between protons and electrons is upset by an outside force, an atom may gain or lose an electron. When electrons are "lost" from an atom, the free movement of these electrons constitutes an electric current.

Section – C

03X03 = 09 arks

1. State and explain Krichhoff's Voltage Law.

Ans. KVL states that the algebraic sum of the voltages between successive nodes in a closed path in a circuit is equal to zero

Or

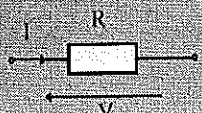
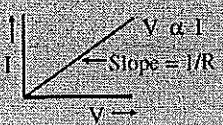
Algebraic sum of all the voltages in a closed electrical circuit is equal to zero.

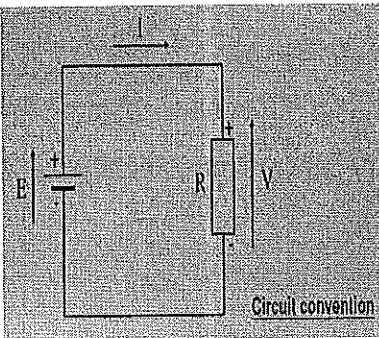
2. State and explain Ohms law.

Ans.

It states that current in a resistive circuit is directly proportional to its applied voltage and inversely proportional to its resistance provided that all other factors (e.g. temperature) remain constant.

ie. $I = \frac{V}{R}$ or $R = \frac{V}{I}$ or $V = IR$



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3. Complete the following table for a circuit consisting of a voltage source connected in series with resistance.

Ans.

	Voltage (V)	Current (A)	Power (w)	Resistance (ohm)
1.	100			1000
2.	500	20		
3.		10	1000	

Ans

1. $V=100$

$$R=100$$

$$\text{Then } I= 100/1000$$

$$0.1$$

$$P=V*I=.1*100=10$$

2. $P=500*20=10000$

$$R=V/I=500/20=25$$

3. $P=1000$

$$I=10$$

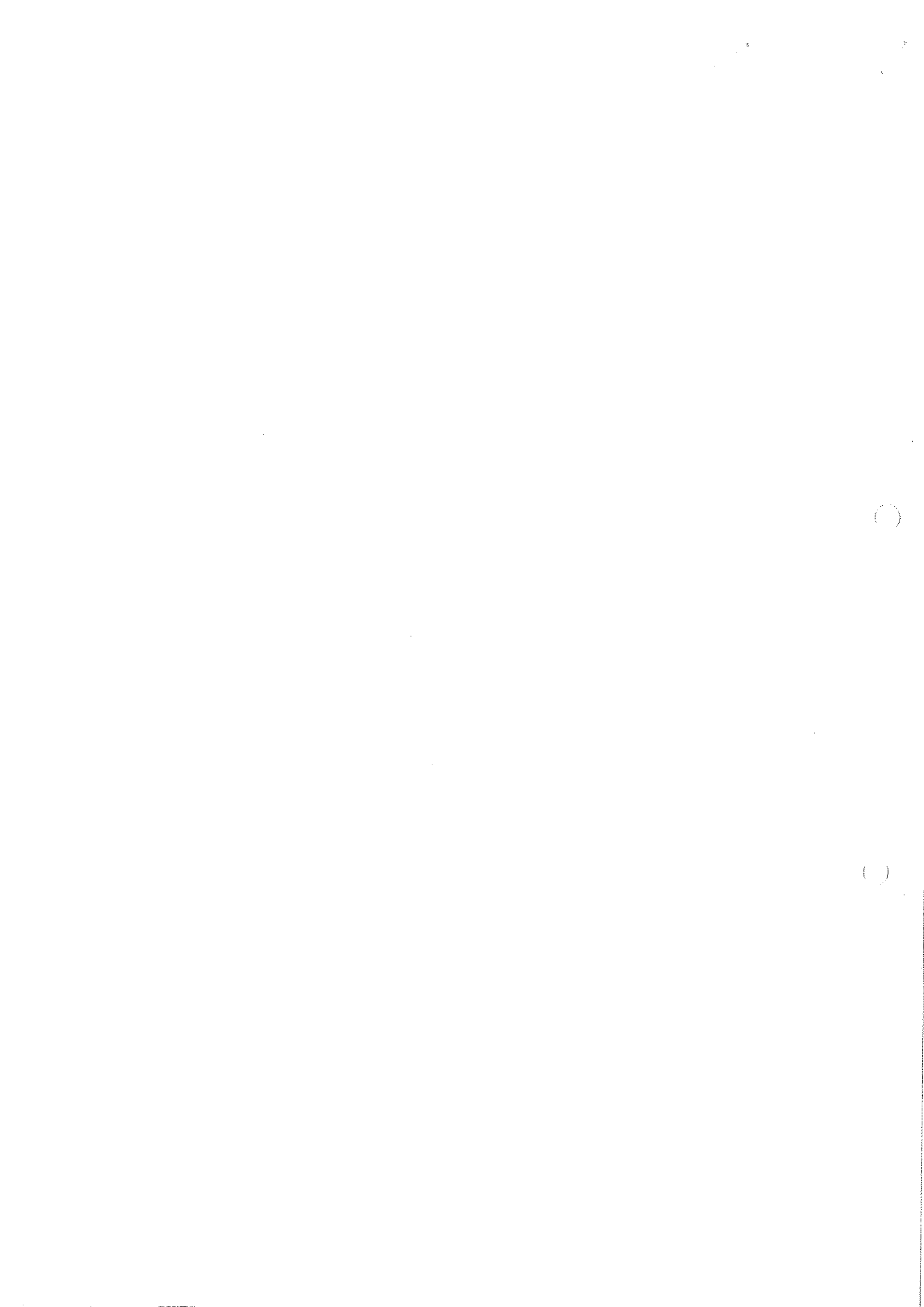
$$1000=10^2*R$$

$$R=1000/100=10$$

$$V=I*R$$

$$V=10*10$$

	Voltage (V)	Current (A)	Power (w)	Resistance (ohm)
1.	100	0.1	10	1000
2.	500	20	1000	25
3.	100	10	1000	10



**BHARTIYA SKILL DEVELOPMENT UNIVERSITY****School of HVAC Skills****1st Semester, 1st-Insem. Examination****B. Voc. Program, Summer (2019-20)****HVA1106 Basic Electronics****Time: 1 Hour****Max. Marks: 20****Answer all the questions****Section – A****05 objective type questions, each question carries 01 mark.****05X01 = 05 Marks**

1. Which one of the following is the unit of Resistance?
(A) Ohm
(B) mho
(C) Farad
(D) Henry
2. Which one of the following is unable to store energy?
(A) Capacitor
(B) Inductor
(C) Resistor
(D) None of the above
3. Which one of the following is the unit of Current?
(A) Farad
(B) Ohm
(C) mho
(D) Amp
4. Which one of the following is the frequency of 230 V AC?
(A) 50 GHz
(B) 50 Hz
(C) 50 kHz
(D) 50 MHz
5. Which one of the following is the larger values Capacitor?
(A) 100 nF
(B) 1 μ F
(C) 200 pF
(D) 500 nF

Section – B**03 short answer type questions, each question carries 02 marks.****06 Marks**

1. What is electrolytic Capacitor? Why is it called electrolytic?
2. You have one Diode, one Electrolytic Capacitor and one Resistor. How can you recognize these components?
3. You have one 3 pin plug with 5A current rating. What does it mean?

Section – C**03 essay type questions, each question carries 03 marks.****03X03 = 09****Marks**

1. What is the difference between Condenser and Capacitor? Three Capacitors 10 μ F, 20 μ F and 30 μ F are connected in series with 10 V AC. Find out the total Capacitance (C) and total charge Q of this circuit.
2. Find out the current in both cases when R1, R2, R3 are connected in series and parallel with applied voltage V.

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3. What is PN Diode? Mention the application of Diode. Draw and Explain Forward Bias PN Junction Diode.

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**BHARTIYA SKILL DEVELOPMENT UNIVERSITY****School of HVAC Skills****1st Semester, 1st-Insem. Examination****B. Voc. Program, Summer (2019-20)****HVA1106 Basic Electronics****Time: 1 Hour****Max. Marks: 20****Answer all the questions****Section – A****05 objective type questions, each question carries 01 mark.****05X01 = 05 Marks**

- Which one of the following is the unit of Resistance?
(A) Ohm
(B) mho
(C) Farad
(D) Henry
- Which one of the following is unable to store energy?
(A) Capacitor
(B) Inductor
(C) Resistor
(D) None of the above
- Which one of the following is the unit of Current?
(A) Farad
(B) Ohm
(C) mho
(D) Amp
- Which one of the following is the frequency of 230 V AC?
(A) 50 GHz
(B) 50 Hz
(C) 50 kHz
(D) 50 MHz
- Which one of the following is the larger values Capacitor?
(A) 100 nF
(B) 1 μ F
(C) 200 pF
(D) 500 nF

Section – B**03 short answer type questions, each question carries 02 marks.****06 Marks**

- What is electrolytic Capacitor? What is variable Capacitor? Give Example.
Ans: It's a kind of Capacitor where Electrolytic materials are used as dielectric layer. Due to the application of Electric field, polarization of the electric is done and two different charges are separated and remain fixed to the particular side. So, it has positive and negative direction.
Variable capacitor is a type of capacitor where Capacitance value is changed. Trimmer Capacitor is the example for this.
- You have one Diode, one Electrolytic Capacitor and one Resistor. How can you recognize these components?
Resistor has color code but, other components have no such color code. Again, Diode two terminals are same size with marked side Cathode and other is Anode. But, Electrolytic capacitor has two terminals with one is big (+Ve) and other is small in size (-Ve).

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3. You have one 3 pin plug with 5A current rating. What does it mean?
 It can sustain maximum 5A current. Beyond this level it may burn. So, it represents maximum current which can tolerate the plug point.

Section – C

03 essay type questions, each question carries 03 marks.

03X03 = 09

Marks

1. What is the difference between Condenser and Capacitor? Three Capacitors 10 μF , 20 μF and 30 μF are connected in series with 10 V AC. Find out the total Capacitance (C) and total charge Q of this circuit.

$$\text{Ans: } C = 1/10 + 1/20 + 1/30 = 0.1 + 0.05 + 0.033 = 0.183 \mu\text{F}$$

$$Q = CV = 10 \times 0.183 = 1.83 \mu\text{C}$$

2. Find out the current in both cases when R1, R2, R3 are connected in series and parallel with applied voltage V.

$$I = V/R_T$$

$$R_T (\text{Series}) = R_1 + R_2 + R_3$$

$$I (\text{Series}) = V / (R_1 + R_2 + R_3)$$

$$I (\text{Parallel}) = V(R_1 + R_2 + R_3) / (R_1 R_2 R_3)$$

3. What is PN Diode? Mention the application of Diode. Draw and Explain Forward Bias PN Junction Diode.

Ans: PN Diode is two terminal semiconductors passive device. It can work in Forward biases not in reverse bias case.

Application: Rectifier

