# B V C INSTITUTE OF TECHNOLOGY & SCIENCE :: BATLAPALEM

MID EXAM - II | **II B TECH II SEM CIVIL** | SUB: **E E**

TIME: 9.30 to 11.00 a. m | DATE: 19.04.24 | MAX MARKS: **15**

ANSWER ALL THE QUESTIONS. | 3 X 5 = 15

1. Water main appurtenances and explain about few important ones? (**C224.3** Remembering)
2. Design aspects of sewers and types of sewers ? (**C224.4** Understanding)
3. Explain about disposal methods of sewage ? (**C224.5** Applying)

BVC INSTITUTE OF TECHNOLOGY & SCIENCE AMALAPURAM

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY AND SCIENCE

DEPARTMENT OF CIVIL ENGINEERING

ENVIRONMENTAL ENGINEERING

## Scheme of Evaluation With CO and BT Mapping

Course: Environmental Engineering (C224) Class: II B. Tech II Sem

AY: 2023 -24

### SCHEME OF EVALUATION WITH CO AND BT MAPPING

| SNO | QUESTION | CO | BT |
|---|---|---|---|
| 1 | Water main appurtenances and explain about few important ones? | C224.3 | Remembering |
| 2 | Design aspects of sewers and types of sewers ? | C224.4 | Understanding |
| 3 | Explain about disposal methods of sewage ? | C224.5 | Applying |

1. Water main appurtenances and explain about few important ones

   Appurtenances 3M
   Explaination 2M

2. Design aspects of sewers and types of sewers

   Design 2M
   Types 3M

3. Explain about disposal methods of sewage

   Explanation 5M

Faculty signature

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

BVC INSTITUTE OF TECHNOLOGY & SCIENCE AMALAPURAM

# BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

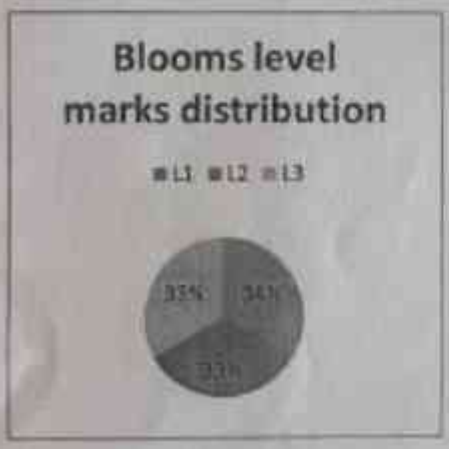
## Department of Civil Engineering

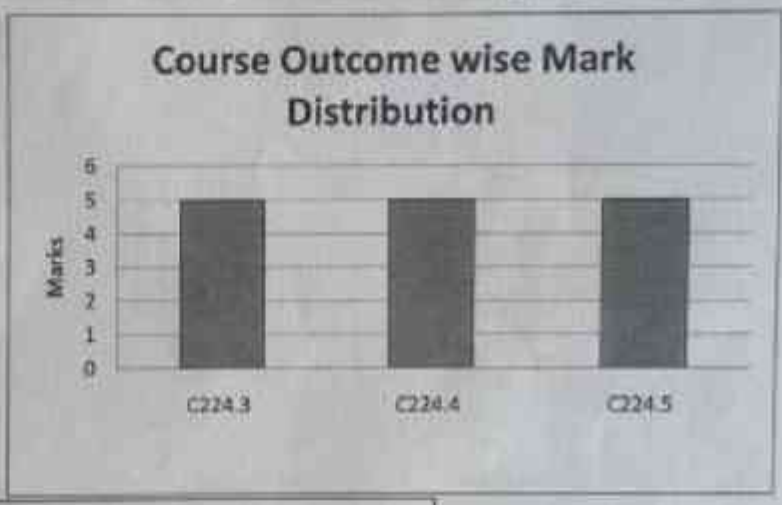
A.Y: 2023-24

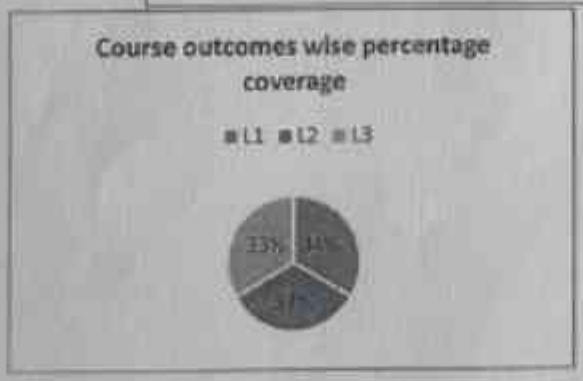
**Course**: Environmental Engineering **Max Marks:15**

**Bran** Civil Engineering **Duration:** 1 Hr 1hr 30 min

| Q.No | Questions | Makrs | CO | BL |
|---|---|---|---|---|
| 1 | Water main appurtenances and explain about few important ones? | 5 | C224.3 | L1 |
| 2 | Design aspects of sewers and types of sewers | 5 | C224.4 | L2 |
| 3 | Explain about disposal methods of sewage | 5 | C224.5 | L3 |




BL – Bloom's Taxonomy Levels (L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analysing, L5 – Evaluating, L6 -Creating)

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

BVC INSTITUTE OF TECHNOLOGY & SCIENCE AMALAPURAM

BVC INSTITUTE OF TECHNOLOGY & SCIENCE, AMALAPURAM

MAIN ANSWER SCRIPT

Name: Afzio Saleena | Regd.: 22HU1A0102 | Date: 19-04-24 | No. of Addls.:

Subject: EE | Class/Course: CIVIL | Invigilator Sign:

1 Ans: **Sewer Appurtenances:**

The following are the main and important types of the sewer appurtenances. They are:

* Manhole
* Clean out
* Regulators
* Catch - basin
* Inlet
* Lamp hole
* Drop backhole
* Flashtanks

Let us briefly discuss about the above following appurtenances

* **Manhole:**

Manhole is a structure which is constructed to provide the access for the facilating the inspections, cleaning and manufacturing of the operations.

· Objectives:

⇒ The manholes are used for cleaning and manufacturing the sewers.

⇒ The obstacles present in the manhole it is collected and brought upto the surface of the ground.

⇒ The joining and changing of the sewer lines.

⇒ The sewers carries of different lines with various directions

⇒ The convenient length of the underground pipes are also taken

⇒ The flow of water and the obstacles can be controlled by the manhole.

• Requirements:-

⇒ Inside the pipe the pipe should be plastered.

⇒ The floor & wall should be impreatus.

⇒ The stagration should be prevented in man hole.

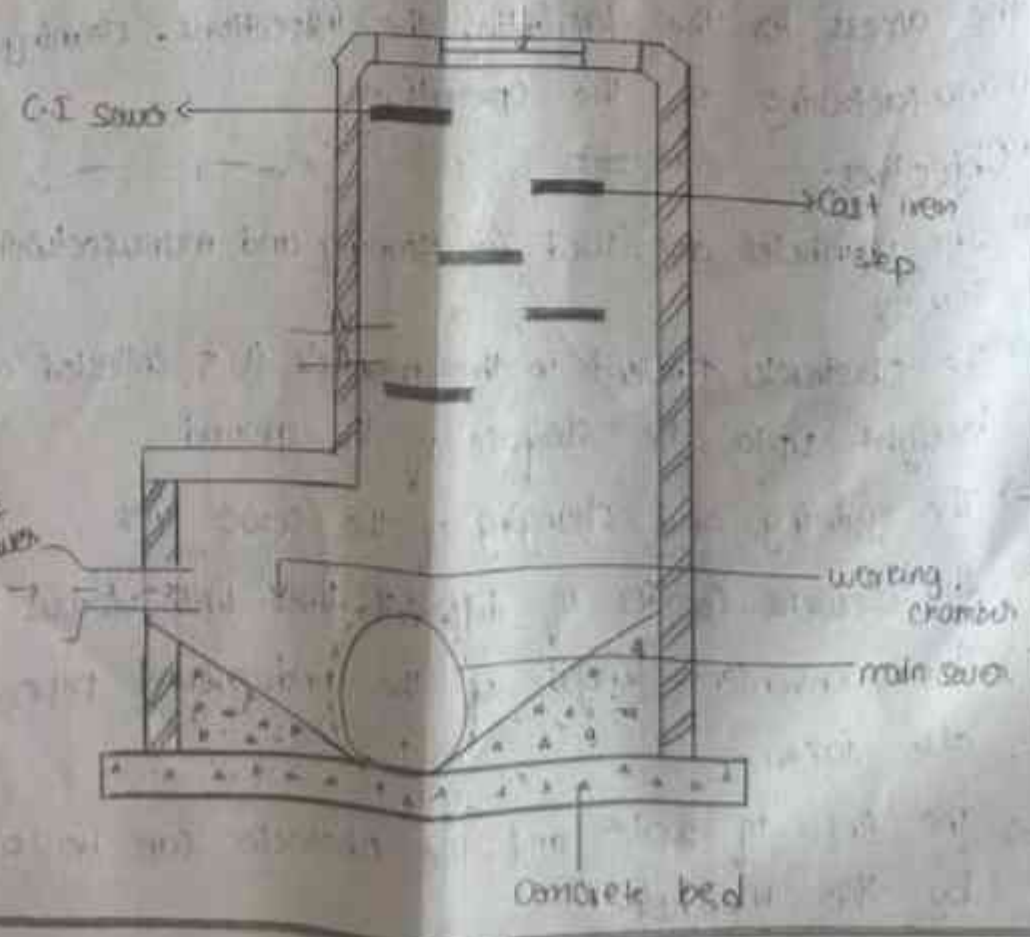
⇒ The safety for the workers to work in.

⇒ The load should be sufficient.

• Parts of Manhole:

Manhole is constructed by concrete of RCC chamber. The chamber is covered by the manhole cover on the top & the chamber is fitted to the cast iron. The following are the main parts of man hole

* An access shaft
* working chamber
* Strong cover on top
* Ladder or Steps



* Clean out:

The pipes which are connected to the lateral sewer the one end of the pipe is brought upto the ground level surface then that system is called as clean out system

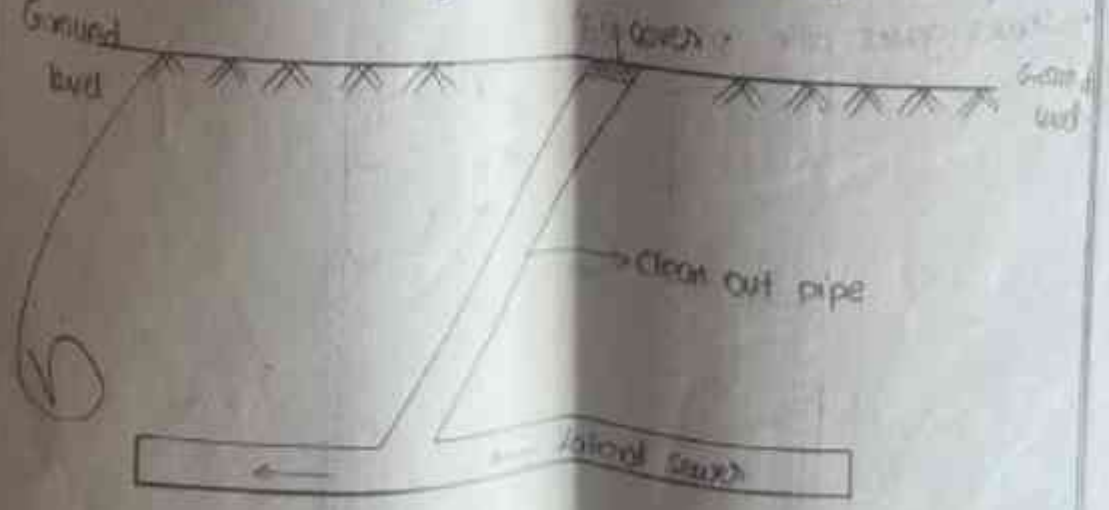
• Location:-

The pipe is placed in the ground and the upper end is placed to the forward. The sewer in the man hole of the placed.

• Working:-

The working of clean out is very simple

* The lateral sewer is brought upto the ground level surface and the water flows.
* The cover is taken out and the water is forced to flow
* The obstacles which are present in the pipe are ellimirated
* If the large obstacle is present then a flexible rod is taken and it is inserted into pipe and pushed forward & backward by through this that is cleared.




* Regulators:

The storm water or relief water is cleared through the process of regulators. The storm water is corrected and distributed

The water is subjected through different sewers present in the sewerage of the system and thus the types of regulating system gives various way to work.

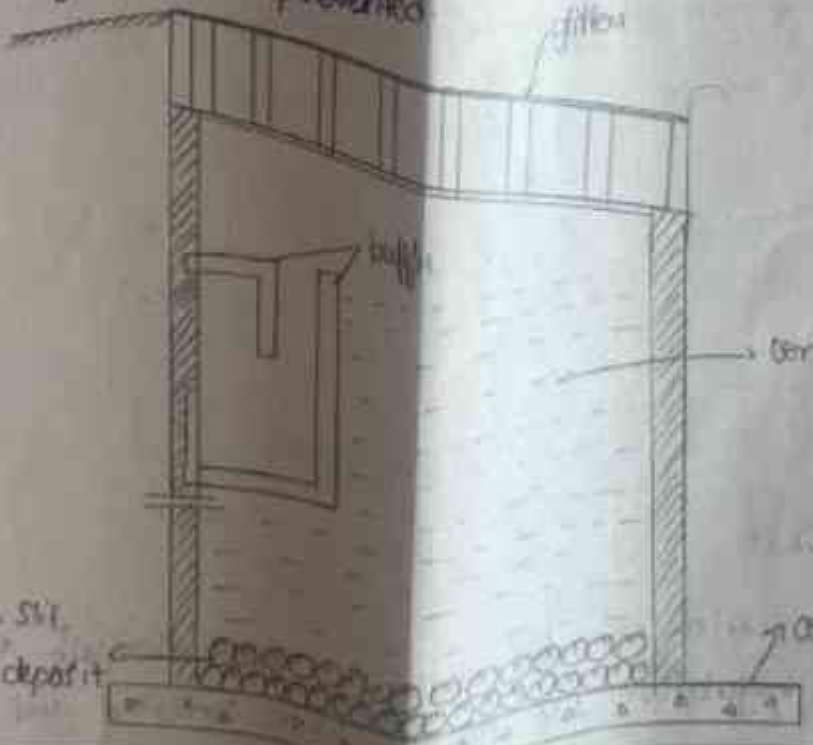
* Over-flow weir
* Leaping weir
* Syphon spill way

## * Catch-basin:

The rain water is cleared and it is recycled to a clean water the process of catch basin is the it is made up of concrete box & consits of different gills the difference b/w the gutter & storm water.

Objects:

- The water should be in form of rain water.
- It is passed through lateral sewer
- Sewerages are controlled
- The rain water is excavated & the waste is seperated
- The impurities are seperated
- The waste matter should be cleared because of bad smell & mosquitoes.
- Sewer gases are prevented



A

Name :
Regd No : 102
Class / Course :
Subject :
Date :
Invigilator Sign :

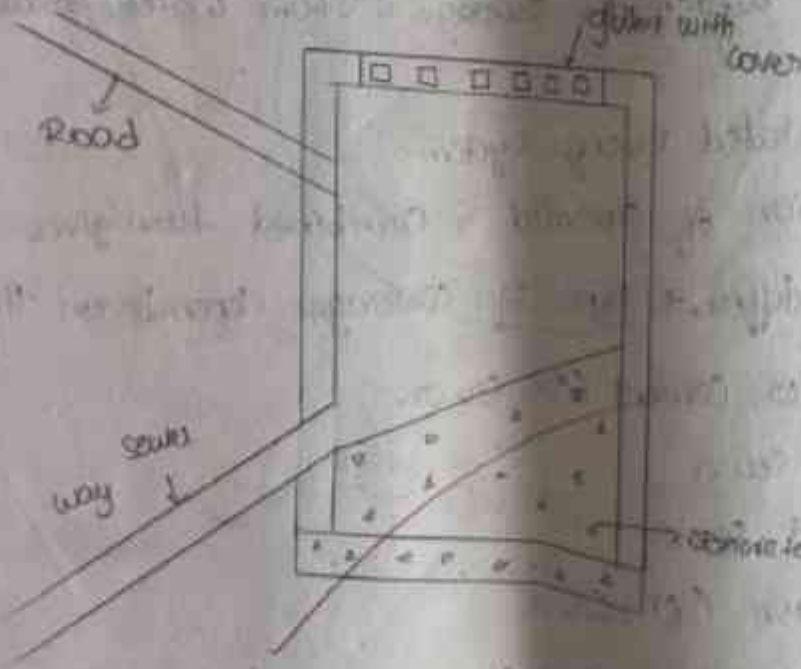
* Inlet:

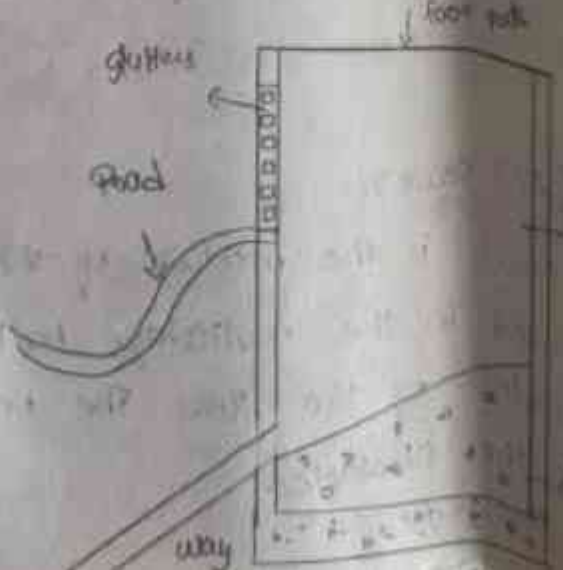
The inlet is the difference btw gutter & storm water. The water is carried out in diff ways and horizontal & vertical. The Inlet sewer is the presence and clear out the way of the obstacles meant for the pipes of sewer.

→ Types of Inlet:

* Horizontal Intake
* Vertical Intake

* (a) Road points
(b) Low pressure.



## Sewer:

The underground conduit which present in the under surface then it is called as sewer which collects the waste matter & drain off the water. The gravity flow is named The main flow sewer is called main force flow

## Sewerages:

The art of the treatment of disposal of the sewer. There are 3 types.

① Primarily System:

In this system the flow of stream water & sewerages sanitary flow in the two sets of sewer

② Combined sewerage system:

The system in which the sewerage & storm water flows in the one set

③ Partially seperated sewerage system:

The combination of seperated & combined flow gives the result.

* There are different types of sewerages depends on the material.
    * Asbestos cement (AC) sewer.
    * Brick sewer
    * Cement sewer.
    * Cast iron (CI) Sewer
    * Steel sewer
    * Plastic sewer

* Asbestos Cement [AC] sewer:

The Asbestos cement sewer is the mixture of the cement & asbestos fibre it is used in the multistage buildings for the higher & upper circulation of the flow. The need of this sewer is to prevent the obstacles.

The cement sewer is

Advantages:

* Light in weight.
* Smooth surface
* Easy to cut off, drill and fitting
* Soil Consumption.

Disadvantages:

* Brittle in nature, can be break due to heavy loads.
* Easily can't be transported

* Brick sewer:

The brick sewers are made at the site of construction and used from there. The system involved is combined system. But now-a-days the brick sewers are not constructed due to leakage of water and thus cement sewers are constructed.

Note:

the bricks which are used should be plastered to prevent the leakages.

- The bricks should be well manufactured.
- It should resist the force

* Cement sewer:

The cement sewer is the important sewer due to its construction & masonary mixture.

1. RCC — diameter upto 60cm dia.

The stability is less so that it cannot be used as more depth

2. PCC — dia > 60cm of dia.

The compactness of the PCC is good so that it can bear the load & impact loads of

* Cast iron sewer:

The CI sewer are most high durable & more effective strength. The impact loads and every load is possible the sewer. The loads are perfect

Requirements:

* The pressure should be under load.
* The temperature should be maintained
* The pressure of the pipe are constant.
* The body of the pipe and the pressure is to be constant.

* Steel sewers:

The pipes which has more strength they are also more likely as the cast iron sewer. The importance of it.

* Plastic sewer:

The PVC is the pipe which is mostly used But due to thermal expansion, the heat is generated & thus the pipe is effected. This pipes may can lead to leakage

3. Disposal Methods of sewage:

There are mainly 2 types of methods

i) Artifical method
ii) Natural method

i) Artifical method

(a) Primary method
(b) Secondary method

ii) Natural method

(a) Dillution.
(b) Land treatment

(a) Dillution:

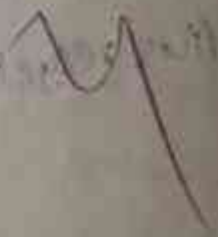
The water treatment of the wastage like seas, lakes, rivers etc treated is called as dillution.

* The proces in which the body are treated due to the wate of the presence.
* The stagnation of the body is treated.
* The floods occurs by that the dillution is carried out
* The proces the water from the bodies seas, lakes, rivers etc
* The dillution is proces in which inoiteration, recycling, dispo and more techniques are involved.
* The water undegoes dillution treatment.
* Dillution tecament is the best treatment for the wate stagnation & thus the cleanliness of the water will be mainted.
* The clean water can be obtained.

(b) Land treatment:

* The land surface which is spreaded over the stagnated water the proces carried out is called as land treatment.
* The land treatment is carried by board irigation.
* The filtration of water carried out in the different way.
* The land waste matter is recycled or converted and it is filtered in the matter.
* The treatment of water is carried out by the

* The Land treatment is divided into 2 types.
    * Filtration.
    * Bord irrigation
* The Land which is treated through the process of surface of land
* The process of the disposal technique is to prevent the obstacles and the process in which the water is treated.
* The treatment of water and the land involves the natural methods of the sewage of techniques.
* The land waste is recycled through different processes.



| S No | Regd. No | CVSM R2022011 | | SMII R2022012 | | H&HM R2022013 | | EE R2022014 | | MEFA R2022015 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 1 | 22H41A0101 | 12 | 14 | 14 | 13 | 13 | 12 | 14 | 14 | 14 | 13 |
| 2 | 22H41A0102 | 15 | 15 | 15 | 14 | 14 | 15 | 15 | 14 | 14 | 14 |
| 3 | 22H41A0103 | 14 | 14 | 15 | 14 | 14 | 13 | 14 | 14 | 14 | 14 |
| 4 | 22H41A0104 | 15 | 14 | 15 | 13 | 14 | 13 | 14 | 14 | 13 | 14 |
| 5 | 22H41A0105 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 13 | 14 | 14 |
| 6 | 22H41A0106 | 12 | 13 | 14 | 12 | 14 | 12 | 14 | 14 | 12 | 13 |
| 7 | 22H41A0107 | 15 | 14 | 15 | 13 | 15 | 15 | 15 | 14 | 14 | 15 |
| 8 | 22H41A0108 | 15 | 15 | 15 | 14 | 15 | 15 | 15 | 14 | 13 | 15 |
| 9 | 22H41A0109 | 15 | 14 | 15 | 13 | 15 | 15 | 15 | 14 | 13 | 13 |
| 10 | 22H41A0110 | 15 | 15 | 15 | 13 | 15 | 11 | 15 | 14 | 12 | 15 |
| 11 | 22H41A0111 | 15 | 15 | 14 | 14 | 14 | 12 | 15 | 14 | 12 | 11 |
| 12 | 22H41A0112 | 15 | 14 | 15 | 15 | 15 | 12 | 15 | 14 | 13 | 13 |
| 13 | 22H41A0113 | 9 | 15 | 14 | 14 | 13 | 14 | 15 | 14 | 12 | 13 |
| 14 | 22H41A0114 | 12 | 14 | 15 | 14 | 13 | 12 | 15 | 14 | 12 | 14 |
| 15 | 22H41A0115 | 15 | 15 | 14 | 14 | 14 | 12 | 15 | 14 | 13 | 12 |
| 16 | 22H41A0116 | 15 | 15 | 15 | 13 | 15 | 14 | 15 | 14 | 13 | 15 |
| 17 | 22H41A0117 | 13 | 15 | 15 | 14 | 14 | 14 | 15 | 12 | 14 | 14 |
| 18 | 22H41A0118 | 10 | 13 | 14 | 13 | 14 | 12 | 15 | 13 | 10 | 11 |
| 19 | 22H41A0119 | 13 | 14 | 14 | 14 | 14 | 11 | 15 | 14 | 12 | 11 |
| 20 | 22H41A0120 | 13 | 15 | 15 | 13 | 15 | 15 | 15 | 14 | 13 | 14 |
| 21 | 22H41A0121 | 15 | 15 | 15 | 15 | 14 | 13 | 15 | 13 | 14 | 11 |
| 22 | 22H41A0122 | 13 | 14 | 14 | 13 | 14 | 10 | 15 | 13 | 12 | 11 |
| 23 | 22H41A0123 | 12 | 15 | 15 | 13 | 14 | 10 | 15 | 14 | 12 | 12 |
| 24 | 22H41A0124 | 15 | 15 | 15 | 14 | 14 | 12 | 13 | 14 | 12 | 12 |
| 25 | 22H41A0125 | 10 | 14 | 15 | 13 | 13 | 12 | 14 | 12 | 12 | 12 |
| 26 | 22H41A0126 | 7 | 15 | 10 | 12 | 10 | 9 | 12 | 14 | 10 | 9 |

| S No | Regd. No | CVSM R2022011 | | SMH R2022012 | | H&HM R2022013 | | EE R2022014 | | M R2 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mi mm 1 |
| 30 | 22H41A0130 | 12 | 13 | 11 | 13 | 14 | 10 | 10 | 14 | 9 |
| 31 | 22H41A0131 | 13 | 14 | 15 | 14 | 15 | 14 | 15 | 14 | 11 |
| 32 | 22H41A0132 | 15 | 14 | 15 | 14 | 15 | 12 | 15 | 14 | 14 |
| 33 | 22H41A0133 | 13 | 14 | 15 | 14 | 15 | 11 | 15 | 14 | 12 |
| 34 | 22H41A0134 | 14 | 15 | 14 | 14 | 14 | 14 | 15 | 14 | 14 |
| 35 | 22H41A0135 | 15 | 13 | 15 | 13 | 12 | 13 | 15 | 14 | 14 |
| 36 | 22H41A0136 | 13 | 14 | 14 | 13 | 15 | 12 | 14 | 13 | 12 |
| 37 | 22H41A0137 | 7 | 14 | 15 | 13 | 13 | 12 | 15 | 14 | 11 |
| 38 | 22H41A0138 | 15 | 14 | 13 | 14 | 13 | 13 | 15 | 14 | 12 |
| 39 | 22H41A0139 | 15 | 15 | 15 | 15 | 14 | 12 | 15 | 14 | 12 |
| 40 | 22H41A0140 | 10 | 12 | 8 | 10 | 12 | 10 | 14 | 14 | 8 |
| 41 | 22H41A0141 | 12 | 14 | 14 | 13 | 11 | 11 | 15 | 14 | 12 |
| 42 | 22H41A0142 | 12 | 15 | 15 | 12 | 14 | 11 | 15 | 14 | 14 |
| 43 | 22H41A0143 | 12 | 15 | 14 | 13 | 14 | 13 | 14 | 14 | 12 |
| 44 | 22H41A0144 | 14 | 15 | 15 | 15 | 15 | 12 | 15 | 14 | 12 |
| 45 | 22H41A0145 | 10 | 14 | 9 | 9 | 10 | 8 | 13 | 10 | 13 |
| 46 | 22H41A0147 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 14 | 14 |
| 47 | 23H45A0101 | 13 | 15 | 14 | 13 | 14 | 10 | 12 | 14 | 12 |
| 48 | 23H45A0102 | 14 | 15 | 13 | 13 | 14 | 9 | 13 | 14 | 12 |
| 49 | 23H45A0103 | 7 | 12 | 11 | 13 | 10 | 11 | 13 | 14 | 10 |
| 50 | 23H45A0104 | 11 | 14 | 15 | 13 | 13 | 11 | 13 | 9 | 11 |
| 51 | 23H45A0105 | 15 | 13 | 15 | 14 | 14 | 15 | 15 | 14 | 13 |
| 52 | 23H45A0106 | 13 | 12 | 13 | 13 | 11 | 10 | 14 | 14 | 10 |
| 53 | 23H45A0107 | 14 | 12 | 15 | 14 | 11 | 11 | 15 | 14 | 12 |
| 54 | 23H45A0108 | 6 | 11 | 13 | 13 | 14 | 10 | 14 | 14 | 12 |
| 55 | 23H45A0109 | 10 | 15 | 15 | 13 | 14 | 13 | 13 | 13 | 10 |

# BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

## Department of Electrical & Electronics Engineering

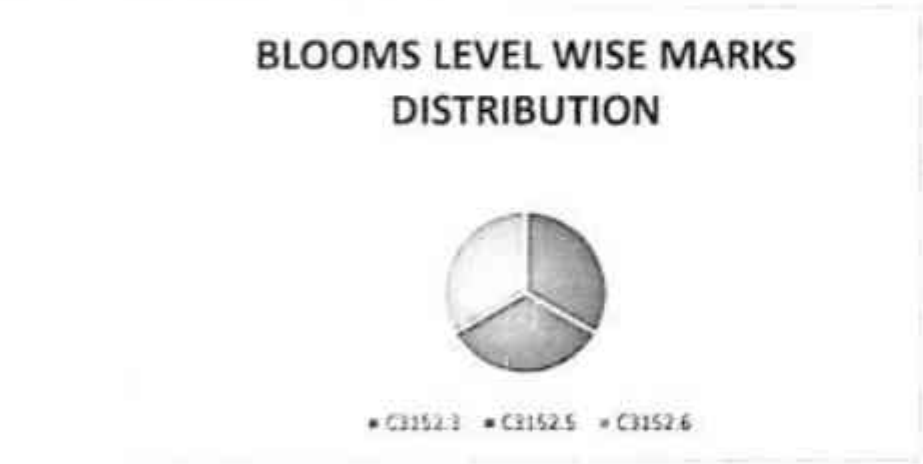
## INTERNAL EXAMINATION-1

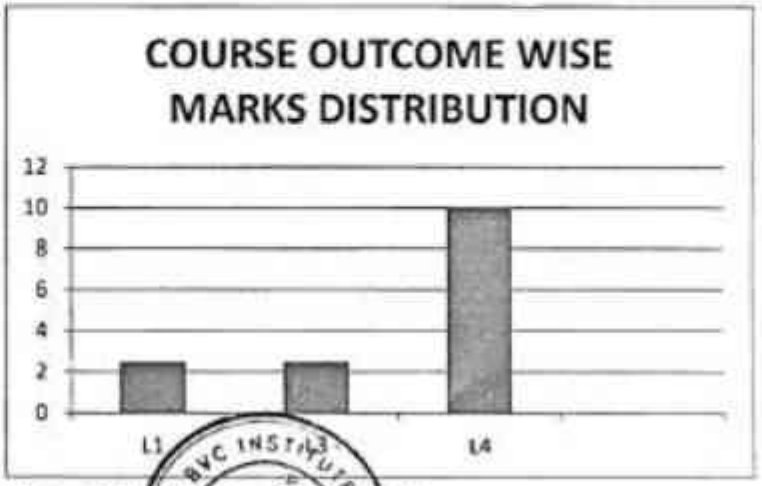
A.Y: 2023-24

Course: UTLISATION OF ELECTRICAL ENERGY — Max Marks: 15

Branch: EEE — Year: III — Semester: I — Duration: 1 Hr 30 min

| Q.No | Questions | Marks | CO | BL |
|---|---|---|---|---|
| 1 a) | Prove that the illumination is proportional to cosine of angle made by the normal to the illuminated surface with the direction of incident flux | 2.5 | C3152.1 | L3 |
| 1 b) | b)A lamp giving out 1010 m in all directions is suspended 7m above the working plane. Find the illumination at a point on the working plane 5m away from the foot of the lamp | 2.5 | C3152.1 | L4 |
| 2 a) | Elaborate the electrical characteristics of a motor used for the electrical drive? | 2.5 | C3152.2 | L1 |
| 2b) | A 450V series motor having armature and field resistances of 0.28 ohms and 0.32 ohms runs at 540 r.p.m when taking 72A. Assuming un saturated field find out its speed when field diverter of 0.872 ohms is used for the loads whose torque remains constant and varies as square of the speed | 2.5 | C3152.2 | L4 |
| 3 a) | Elaborate the meritorious advantages of electrical heating process? | 2.5 | C3152.3 | L4 |
| 3 b) | Compare the features of direct and in direct core type induction furnaces? | 2.5 | C3152.3 | L4 |




BL – Bloom's Taxonomy Levels (L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analysing, L5 – Evaluating, L6 -Creating)

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 201

## Bonam Venkata Chalamayya Institute of Technology & Science

### Department of Electrical and Electronics Engineering

### Scheme of Evaluation with CO and BT Mapping

Course: **UTILISATION OF ELECTRICAL ENERGY** (C3152)
Class: III B.Tech I[st] semester
AY: 2023-24

**SCHEME OF EVALUATION WITH CO AND BT MAPPING**

| SNO | QUESTION | CO | BT |
|---|---|---|---|
| 1 a) | Prove that the illumination is proportional to the cosine of the angle made by the normal to the illuminated surface with the direction of incident flux. | C3152.1 | Applying |
| 1 b) | A lamp giving out 1010 m in all directions is suspended 7m above the working plane. Find the illumination at a point on the working plane 5m away from the foot of the lamp ? | C3152.1 | Analyzing |
| 2 a) | Elaborate the electrical characteristics of a motor used for the electrical drive? | C3152.2 | Remembering |
| 2 b) | A 450V series motor having armature and field resistances of 0.28 ohms and 0.32 ohms runs at 540 r.p.m when taking 72A. Assuming un saturated field find out its speed when field diverter of 0.872 ohms is used for the loads whose torque remains constant and varies as square of the speed? | C3152.2 | Analyzing |
| 3 a) | Elaborate the meritorious advantages of electrical heating process? | C3152.3 | Analyzing |
| 3 b) | Compare the features of direct and in direct core type induction furnaces? | C3152.3 | Analyzing |

1 a) Statement & Diagram------1M

Derivation of Lamberts Cosine Law -----1.5M

b) Problem ----------2.5M

2 a) Electrical Characteristics --------1M
Explanation ------1.5M
b) Problem -------2.5M

3 a) Advantages of Electrical Heating ----2.5M
b) Compare Direct & Indirect core type Furnaces-----2.5M

HOD

PRINCIPAL
PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

Verified by me A. Haritha

BVC INSTITUTE OF TECHNOLOGY & SCIENCE, AMALAPURAM

MAIN ANSWER SCRIPT

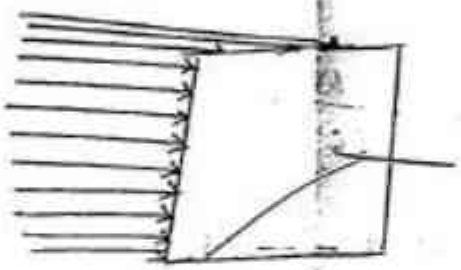
Name: A. Haritha Regd.: 21HU1A0201 Date: 21/04/2024 No. of Addl.:

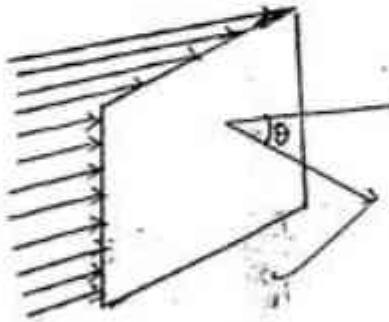
Subject: UEE Class / Course: 3rd B.Tech (EEE) Invigilator Sign

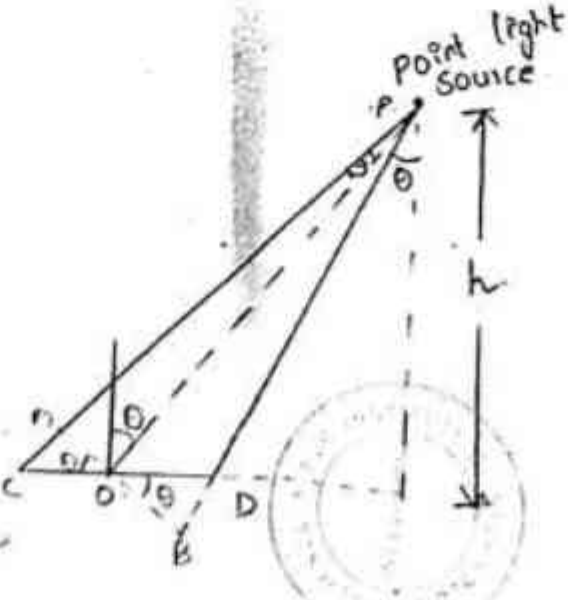
1.(a) Any: **Lambert's cosine law:**

The illumination of a plane is proportional to the cosine angle b/w the normal surface to the direction of flux.

$E \propto \cos\theta$




PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 22

Let us consider the flux is falling on the surface ABCD with height 'h' and distance 'r'.

Let θ be the angle between P of point light source as shown in the figure D.

Let OD is the surface area of CD with angle 'θ', 'AB' is the surface area of OP with angle 'w'.

$$CD = \frac{AB}{\cos\theta}$$

$$\cos\theta = \frac{AB}{CD}$$

$$E = \frac{I}{r^2}\cos\theta$$

(or)

$$E = \frac{I}{h^2}\cos^3\theta.$$

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 201

3.(b)

Given data.

$I = 1010$ candela

$h = 4m$

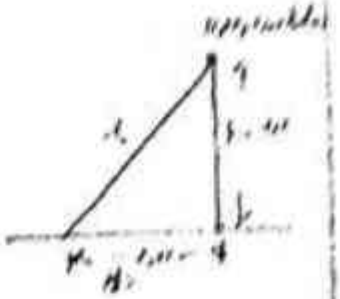
$d = 6m$

$r = \sqrt{h^2 + d^2}$

$= \sqrt{(4)^2 + (6)^2}$

$= \sqrt{16 + 36}$

$r = 7.6m$.



$\cos\theta = \frac{h}{r} = \frac{4}{7.6} = 0.21$

from Lambert's cosine law.

$E = \frac{I}{r^2} \cos\theta$

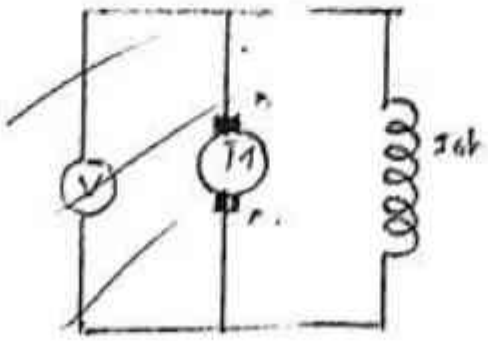
$= \frac{1010}{(7.6)^2} \times 0.21$

$E = 11.01$ Lux.

5)(a)

Ans: Electrical characteristics:

1. DC Shunt motor:




A field winding is connected across the motor armature is called DC shunt motor.

PRINCIPAL
Institute of Technology & Science
MALAPURAM - 51...21

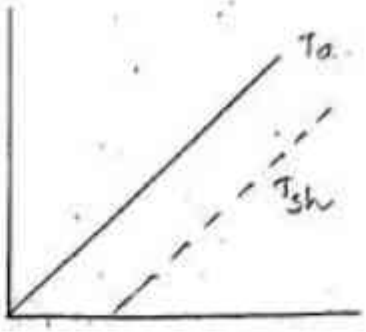
(i) Torque Vs Armature current:

For dc motor, the expression is.

$T \propto \phi I_a$.

Where, $\phi$ = constant

$T \propto I_a$.




Torque is directly proportional to the Armature current.

If load increases the Armature current increases, and Torque also increases.

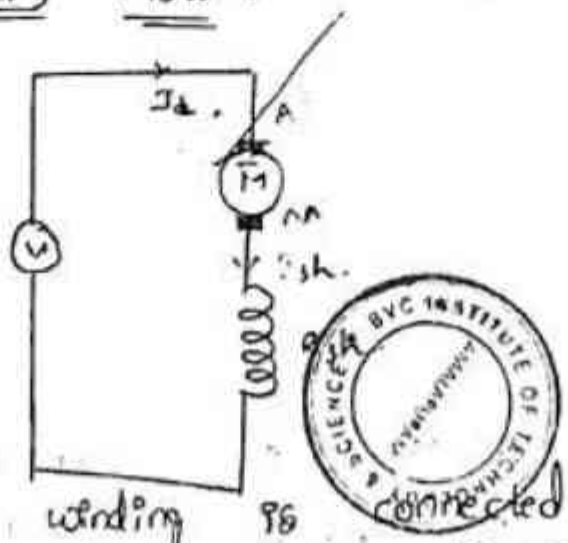
load ↑ $I_a$ ↑ — T ↑

The shaft torque $T_{sh}$ is less than the $T_a$.

$T_{sh} < T_a$.

Therefore the graph will be a straight line passing through the origin.

2. DC Series Motor:




A field winding is connected with the motor armature is called DC

BVC INSTITUTE OF TECHNOLOGY & SCIENCE, AMALAPURAM

ADDITIONAL ANSWER SCRIPT

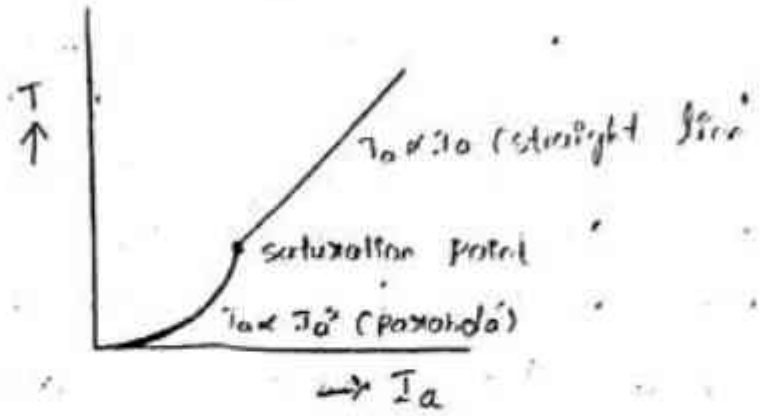
(B)

Name : A. Hasitha Regd. No. [illegible] Date : [illegible] No. of Addl. Sheets

Subject : UEI Class / Course : 3rd B.Tech (EEE) Invigilator Sign :

Series Motor

(1) Torque Vs Armature current :




For dc motor the expression is

$T_a \propto \phi I_a$.

In series motor, the flux is directly proportional to the Armature current

$\phi \propto I_a$.

$T_a \propto I_a^2$.

the torque is directly proportional to the square of the armature current.

$T_a \propto I_a^2$.

If load increases, the torque also increases and the armature current square times increases.

load ↑ $I_a^2$ ↑↑ & $T_a$ ↑.

Therefore the graph will be a

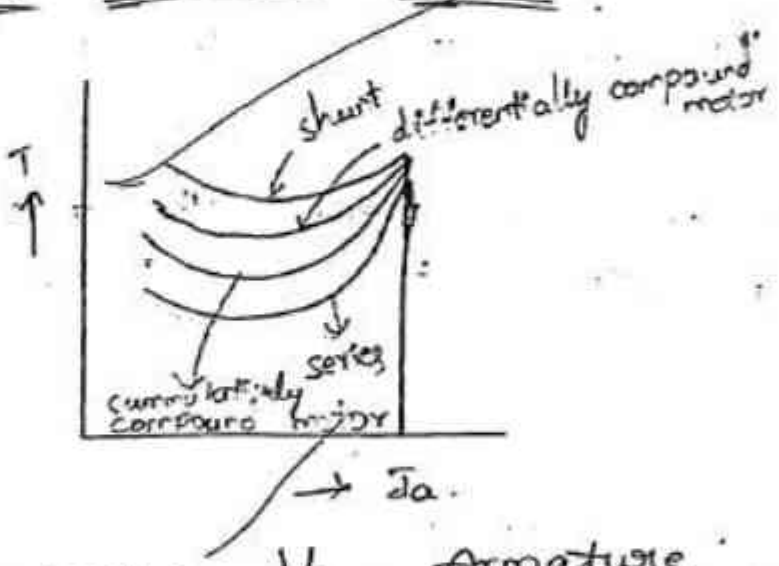
PRINCIPAL
BVC Institute of Technology & Science,
BATLAPALEM, AMALAPURAM - 533 201

parabola when $T_a \propto I_a^2$. After it reaches saturation point then the graph is a straight line when $T_a \propto I_a$.

3. Dc compound Motor:

In Dc compound motor is the combination of shunt and series motor. The characteristics are depends on. cummulatively compound motor and differentially compound motor.

Torque Vs Armature current:




In Torque Vs Armature current the differentially wound compound wound motor decreases the motors.

2.(b)

Given data.

$V = 450\ V$;

$R_a = 0.28\ \Omega$

$R_{se} = 0.32\ \Omega$.

$N_1 = 540$ rpm.

$I_a = 72$ A.

field diverter $R = 0.872\ \Omega$.

$T_a \propto \phi I_a$.

~~$T_a \propto \phi I_a$~~.

~~$T_a \propto I_a^2$~~.

$T_1 = T_2$.

$\phi_1 I_{a1} = \phi_2 I_{a2}$.

~~$I_{a1} I_{a1} = I_{a2} I_{a2}$~~

$I_{a1}^2 = I_{a2}^2$

$I_{a1} = I_{a2} = 72$ A.

$T \propto N^2$

$N^2 \propto I_a^2 \Rightarrow N \propto I_a$

$E_{b1} = V - I_{a1}(R_a + R_{se})$

$= 450 - 72\ (0.28 + 0.32)$

$= 450 - 72(0.6)$

$= 406.8$.

$E_{b2} = V - I_{a1}(R_a + R_{se} + R)$

$= 450 - 72\ (0.28 + 0.32 + 0.872)$

$= 450 - 72(1.472)$

$= 344.$

$N \propto \frac{E}{\phi}$

PRINCIPAL
Bhoj. Institute of Technology & Science
BHIMAVARAM, AMALAPURAM - 533 201

$$\frac{N_1}{N_2} = \frac{\epsilon_{b1}}{\epsilon_{b2}} \times \frac{A_2}{A_1}$$

$$\frac{540}{N_2} = \frac{406.8}{344.01} \times$$

$$\frac{540}{N_2} = 1.183$$

$$N_2 = \frac{540}{1.183}$$

$$N_2 = 456.46 \text{ rpm}$$

3. (a)

Ans:- **Advantages of electrical heating process:**

1. **Economical:**

The electric heating equipment is cheaper, there is no required skilled persons. Therefore the cost of installation is less.

2. **pollution free:**

there is no flue gases in electric heating so the surrounding is not pollute (or) pollution free.

3. **cleanliness:**

Since dust and ash are not produced in electric heating so the surroundings should maintain cleanliness.

Name : A. Harsha Regd. : [illegible] Date : [illegible] No. of Addl. :
Subject : UE Class / Course : [illegible]

4. Automatic protection:

protection against over current and over heating that can be used by fast control devices.

5. Easy to control:

the temperature can be controlled manually (or) Automatically.

6. safety:

The electric heating .. safe.

7. High efficiency:

In non-electric heating 40-60% heat is utilized but in electric-heating 75-100% is successfully utilized so the electric heating is high efficiency.

8. Non-conducting heating elements:

The heat can be produced by non-conducting heating elements such as wood and porcelain.

9. 9. Better working conditions.

BVC INSTITUTE OF TECHNOLOGY & SCIENCE AMALAPURAM

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

3(b)

Ans:

## Direct Induction furnaces:

1. A large amount of charge is required to heat.
2. The charge is placed in the secondary winding.
3. The primary winding flux is passes the secondary winding and the charge will be heated.
4. It is based on the Induction principle.

## Indirect Induction furnaces:

1. A sufficient amount of charge is required to heat.
2. The charge is placed in the inside the furnace.

BVC INSTITUTE OF TECHNOLOGY & SCIENCE * AMALAPURAM

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM

| S.No | Regd No | PS - II | | PE | | CS | | UEE | | OOP JAVA | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Int(d) max 15 | Ass(d) max 15 | Int(d) max 15 | Ass(d) max 15 | Int(d) max 15 | Ass(d) max 15 | Int(d) max 15 | Ass(d) max 15 | Int(d) max 15 | Ass(d) max 15 |
| 1 | 20H41A0232 | 9 | 10 | 7 | 9 | 10 | 10 | 9 | 12 | 9 | 15 |
| 2 | 21H41A0201 | 14 | 11 | 11 | 14 | 10 | 13 | 10 | 13 | 15 | 15 |
| 3 | 21H41A0202 | 7 | 2 | 0 | 3 | 0 | 3 | 5 | 4 | 7 | 7 |
| 4 | 21H41A0204 | 14 | 13 | 10 | 15 | 15 | 14 | 14 | 12 | 15 | 15 |
| 5 | 21H41A0205 | 14 | 12 | 10 | 10 | 10 | 10 | 13 | 11 | 15 | 15 |
| 6 | 21H41A0207 | 13 | 10 | 8 | 10 | 6 | 9 | 11 | 11 | 13 | 12 |
| 7 | 21H41A0208 | 3 | A | 5 | A | 5 | 1 | 1 | 0 | 6 | 9 |
| 8 | 21H41A0209 | 9 | 10 | 4 | 10 | 7 | 8 | 5 | 7 | 8 | 7 |
| 9 | 21H41A0210 | 11 | 9 | 10 | 10 | 9 | 8 | 8 | 5 | 9 | 8 |
| 10 | 21H41A0211 | 4 | 6 | 4 | 2 | 11 | 0 | 5 | 2 | 6 | 5 |
| 11 | 21H41A0212 | 2 | 6 | 6 | 4 | 2 | 6 | 6 | 4 | 7 | 9 |
| 12 | 21H41A0213 | 1 | A | 2 | A | 0 | A | 2 | A | 7 | A |
| 13 | 21H41A0215 | 5 | 12 | 8 | 9 | 3 | 8 | 3 | 3 | 7 | 12 |
| 14 | 21H41A0216 | 12 | 14 | 8 | 8 | 8 | 12 | 15 | 14 | 11 | 15 |
| 15 | 21H41A0218 | 13 | 11 | 10 | 14 | 13 | 13 | 9 | 9 | 14 | 13 |
| 16 | 21H41A0219 | 14 | 13 | 12 | 14 | 14 | 12 | 15 | 13 | 14 | 15 |
| 17 | 21H41A0220 | 8 | 9 | 8 | 10 | 8 | 11 | 3 | 11 | 10 | 11 |
| 18 | 21H41A0221 | 10 | 12 | 7 | 8 | 5 | 12 | 11 | 9 | 12 | 13 |
| 19 | 21H41A0222 | 1 | A | 3 | A | 0 | 0 | 2 | A | 0 | 6 |
| 20 | 21H41A0223 | 5 | A | 1 | 0 | 6 | 3 | 0 | A | 0 | 8 |
| 21 | 21H41A0224 | 5 | A | 1 | 0 | 0 | 0 | 0 | A | 10 | 3 |
| 22 | 21H41A0225 | 10 | 10 | 3 | 2 | 8 | 9 | 6 | 6 | 10 | 13 |
| 23 | 21H41A0226 | 13 | 13 | 8 | 10 | 14 | 14 | 11 | 12 | 15 | 15 |
| 24 | 21H41A0227 | 10 | 10 | 7 | 8 | 3 | 8 | 9 | 2 | 11 | 11 |
| 25 | 21H41A0228 | 14 | 12 | 8 | 13 | 12 | 10 | 11 | 8 | 13 | 13 |
| 26 | 21H41A0229 | 8 | 9 | 8 | 7 | 5 | 2 | 4 | 6 | 8 | 7 |
| 27 | 21H41A0230 | 7 | 10 | 6 | 7 | 0 | 10 | 5 | 3 | 12 | 15 |
| 28 | 21H41A0231 | 12 | 14 | 10 | 8 | 14 | 14 | 15 | 14 | 15 | 14 |

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM

| S.No | Regd. No | PS-II | | FT | | CS | | CLL | | OOP JAVA | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Int1 | Int2 | Int1 | Int2 | Int1 | Int2 | Int1 | Int2 | Int1 | Int2 | |
| 30 | 21H41A0232 | 8 | 9 | 6 | 7 | 3 | 9 | 9 | 9 | 12 | 8 | 53 |
| 31 | 21H41A0233 | 14 | 11 | 11 | 8 | 10 | 6 | 9 | 7 | 14 | 10 | 54 |
| 32 | 21H41A0234 | 7 | 9 | 6 | 6 | 2 | 6 | 7 | 12 | 9 | 3 | 39 |
| 33 | 21H41A0235 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 60 |
| 34 | 21H41A0237 | 15 | 14 | 13 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 61 |
| 35 | 21H41A0238 | 4 | 1 | 1 | 3 | 5 | 5 | 6 | 6 | 7 | 3 | 62 |
| 36 | 21H41A0239 | 5 | A | 8 | A | 6 | 2 | A | 7 | A | 6 | 63 |
| 37 | 21H41A0240 | 8 | 7 | 9 | 11 | 11 | A | 12 | 9 | 8 | 12 | 64 |
| 38 | 21H41A0241 | 6 | 7 | 9 | 6 | 12 | 10 | 7 | 4 | 13 | 13 | 65 |
| 39 | 21H41A0242 | 11 | 11 | 9 | 12 | 11 | 13 | 11 | 10 | 12 | 15 | 66 |
| 40 | 21H41A0243 | 10 | 8 | 8 | 9 | 9 | 5 | 8 | 8 | 6 | 15 | |
| 41 | 21H41A0244 | 14 | A/10 | 11 | 10 A | 13 | A | 13 | A/11 | 12 | A/5 | |
| 42 | 21H41A0245 | 13 | 12 | 10 | 11 | 14 | 14 | 14 | 10 | 10 | 12 | |
| 43 | 21H41A0246 | 13 | 10 | 10 | 14 | 14 | 12 | 13 | 12 | 13 | 15 | |
| 44 | 21H41A0247 | 13 | 7 | 10 | 14 | 13 | 12 | 11 | 12 | 11 | 12 | |
| 45 | 21H41A0248 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | |
| 46 | 21H41A0249 | 12 | 9 | 12 | 14 | 9 | 13 | 10 | 11 | 14 | 15 | |
| 47 | 21H41A0250 | 4 | 5 | 8 | 2 | 5 | A | 1 | 0 | 3 | 12 | |
| 48 | 21H41A0251 | 13 | 13 | 13 | 5 | 12 | 11 | 14 | 14 | 13 | 14 | |
| 49 | 21H41A0252 | 4 | A | 0 | A | 2 | 4 | 4 | A | A | 4 | |
| 50 | 21H41A0253 | 15 | 10 | 10 | 14 | 13 | 11 | 12 | 13 | 14 | 15 | |
| 51 | 21H41A0254 | 14 | 9 | 8 | 11 | 13 | 14 | 12 | 10 | 11 | 15 | |
| 52 | 21H41A0255 | 15 | 12 | 13 | 8 | 10 | 10 | 12 | 11 | 14 | 15 | |
| 53 | 21H41A0256 | 15 | 14 | 12 | 12 | 12 | 15 | 15 | 15 | 15 | 15 | |
| 54 | 21H41A0257 | 12 | 12 | 8 | 8 | 10 | 12 | 8 | 8 | 12 | 10 | |
| 55 | 21H41A0258 | 8 | 8 | 8 | 8 | 6 | 6 | 7 | 1 | 10 | 8 | |
| 56 | 21H41A0259 | 13 | | | | 5 | 11 | 12 | 9 | 11 | 12 | |
| | 21H41A0260 | 4 | | | | 9 | 5 | 10 | 8 | 5 | 13 | |

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 201

| S No | Regd. No | PS-II R2031021 | | PE R2031022 | | CS R2031023 | | UEE R2031028 | | OOPJAVA R2031034 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 57 | 211141A0261 | 5 | 6 | 4 | 4 | 8 | 8 | 7 | 4 | 10 | 12 |
| 58 | 211141A0262 | 4 | 8 | 4 | 4 | 8 | 5 | 8 | 1 | 9 | 12 |
| 59 | 211141A0263 | 13 | 14 | 10 | 12 | 12 | 13 | 13 | 15 | 13 | 14 |
| 60 | 211141A0264 | 8 | 12 | 4 | 9 | 11 | 8 | 12 | 5 | 9 | 9 |
| 61 | 211141A0265 | 5 | 10 | 6 | 7 | 5 | 5 | 8 | 1 | 7 | 8 |
| 62 | 221145A0201 | 13 | 11 | 10 | 13 | 5 | 14 | 12 | 15 | 13 | 15 |
| 63 | 221145A0202 | 10 | 12 | 8 | 6 | 9 | 8 | 9 | 9 | 9 | 9 |
| 64 | 221145A0203 | 14 | 13 | 14 | 11 | 9 | 15 | 15 | 15 | 10 | 14 |
| 65 | 221145A0204 | 14 | 15 | 12 | 11 | 14 | 15 | 15 | 15 | 15 | 15 |
| 66 | 221145A0205 | 11 | 13 | 14 | 8 | 13 | 13 | 15 | 15 | 13 | 12 |
| 67 | 221145A0206 | 10 | 12 | 7 | 7 | 8 | 14 | 15 | 15 | 12 | 14 |
| 68 | 221145A0207 | 13 | 13 | 10 | 8 | 9 | 15 | 14 | 15 | 14 | 14 |

| S No | Regd. No | PS-II R2031021 | | PE R2031022 | | CS R2031023 | | UEE R2031028 | | IOT A R2031044 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 1 | 226M5A0215 | | 14 | | 9 | | 15 | | 15 | | 13 |

Signature of the Faculty:

Dept. Exams Incharge

HOD

Exams Incharge

Principal

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM

# BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

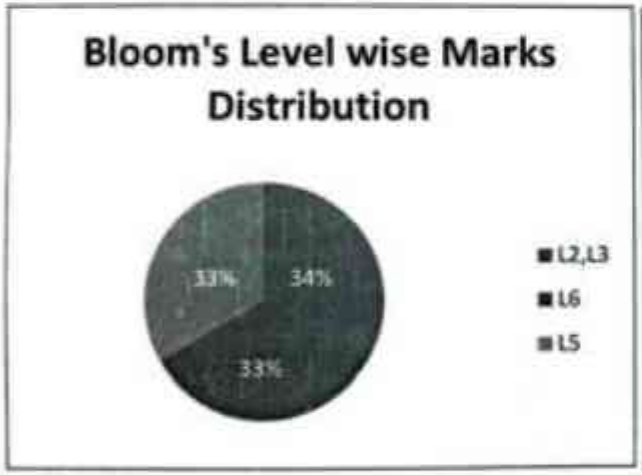
## Department of Mechanical Engineering

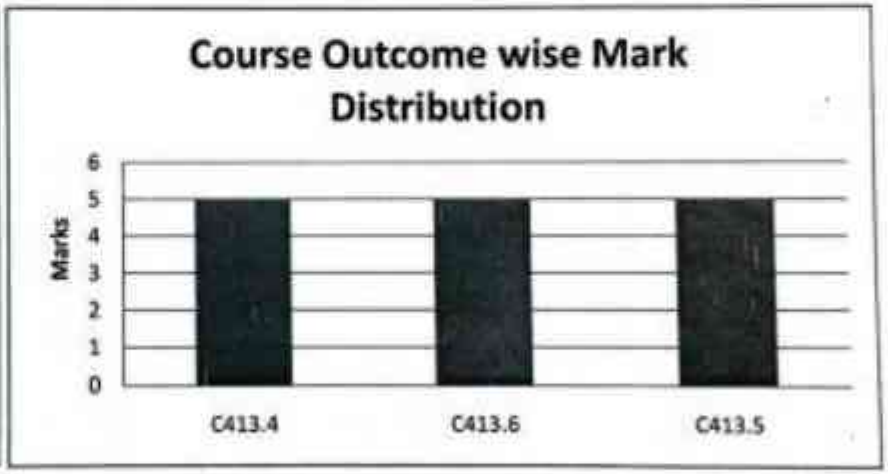
A.Y: 2023-2024 Mid-II

Course: CNDE Max Marks: 15

Branch: Mech year:IV Semister:I Duration: 1.5Hr

| Q.No | Questions | Makrs | CO | BL |
|---|---|---|---|---|
| 1 | D1) (a) Write short notes about the standard depth of penetration in Eddy Current testing.(2M) (Understanding).<br>(b) Illustrate the principle of eddy current testing in detail?(3M) (Understanding) | 5 | C413.4 | L2,L3 |
| 2 | Discuss the procedure of magnetic particle test in detail? (Creating) | 5 | C413.6 | L6 |
| 3 | Explain active and passive techniques in detail. (Evaluating) | 5 | C413.5 | L5 |



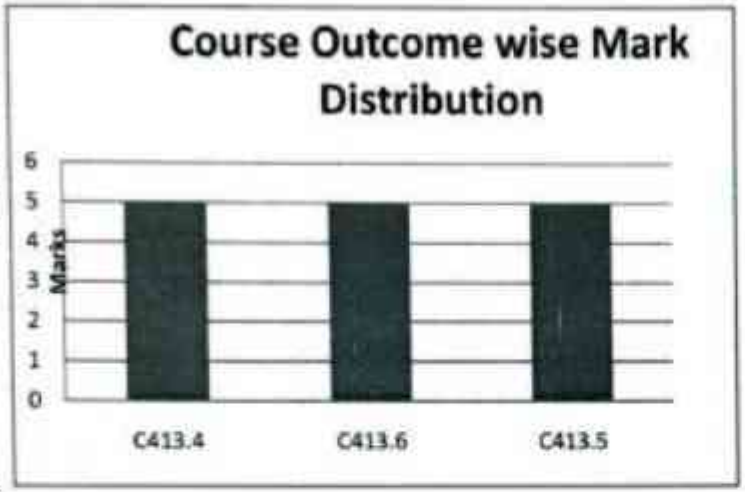




BL – Bloom's Taxonomy Levels (L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analysing, L5 – Evaluating, L6 -Creating)

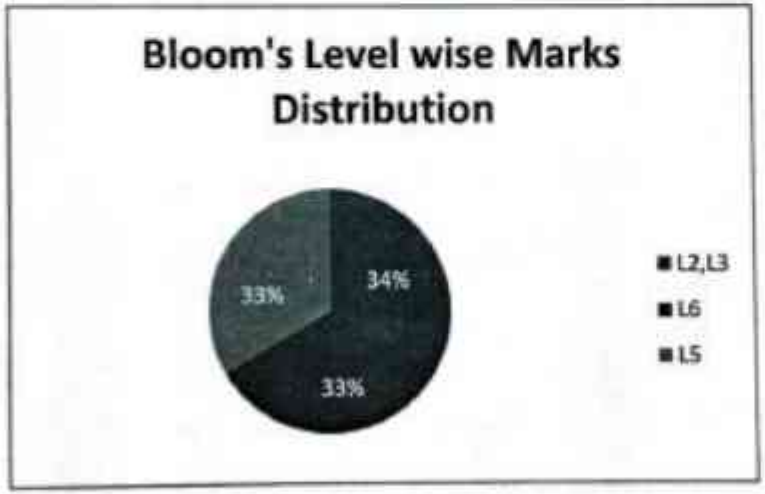
CO – Course Outcomes

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

| CO | MARKS |
|---|---|
| C413.4 | 5 |
| C413.6 | 5 |
| C413.5 | 5 |




| BL | marks |
|---|---|
| L2,L3 | 5 |
| L6 | 5 |
| L5 | 5 |




PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

B V C INSTITUTE OF TECHNOLOGY & SCIENCE:: BATLAPALEM

MID EXAM - II | IV B TECH I SEM MECH | SUB: NDE

TIME: 9.10 to 10.40 a. m | DATE: 07-12-2023 | MAX MARKS: 15

ANSWER ALL THE QUESTIONS

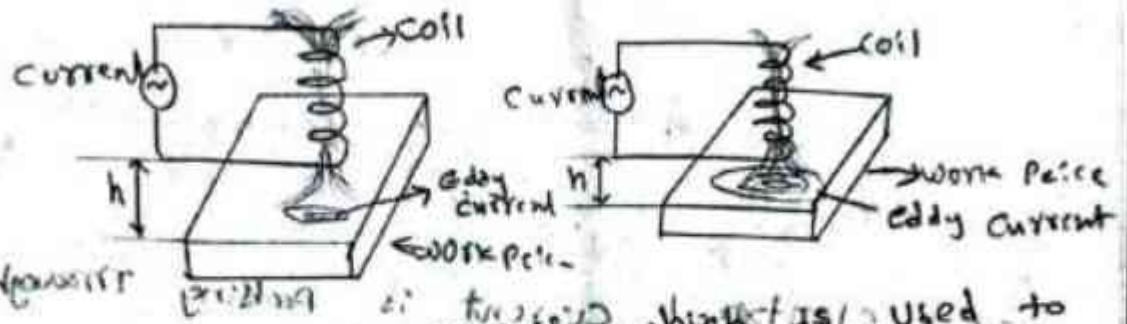
1) (a) Write short notes about the standard depth of penetration in Eddy Current testing.(2M) (Understanding)
   (b) Illustrate the principle of eddy current testing in detail?(3M) (Understanding)
2) Discuss the procedure of magnetic particle test in detail? (Creating)
3) Explain active and passive techniques in detail. (Evaluating)

BVC INSTITUTE OF TECHNOLOGY & SCIENCE * AMALAPURAM

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

11 a)

## Depth penetration:-

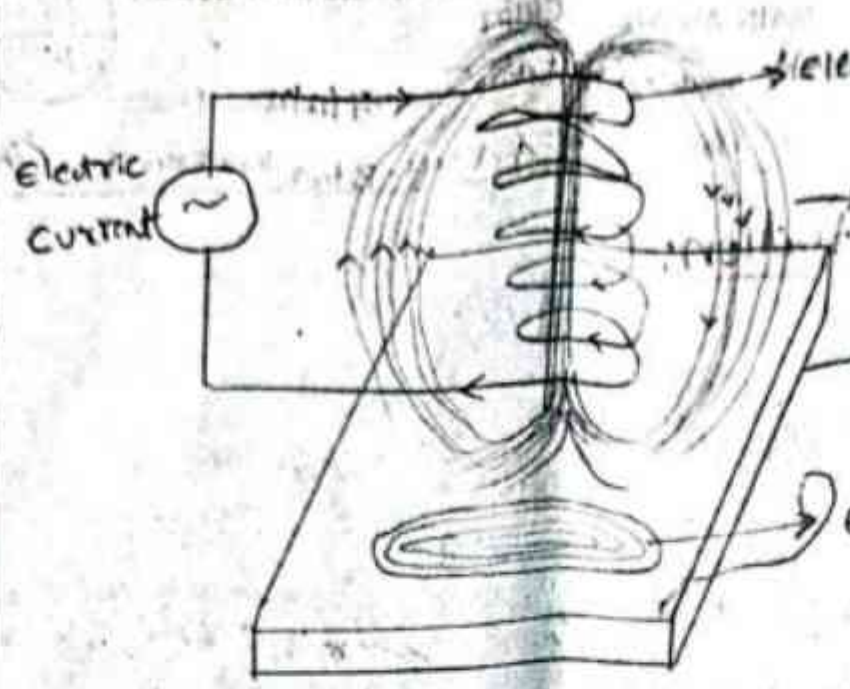



Depth penetration is the process which is used to improve the eddy current concentration on the work peice. The height of the coil is based on work pelce surface is decreases then the coil produal the electro magnetic field was highly passed through the work peice. Then the high amount of eddy current was produced. This Depth penetration process is mainly depend on the Distance between coil and work pelce surface area.

b)

## Eddy current Testing:

Eddy current Test is the one of the non Destructive Test. In these Test is used to find the flaws, internal cracks, slow holes, seams... etc. This eddy current Test is mainly used in electric conductive

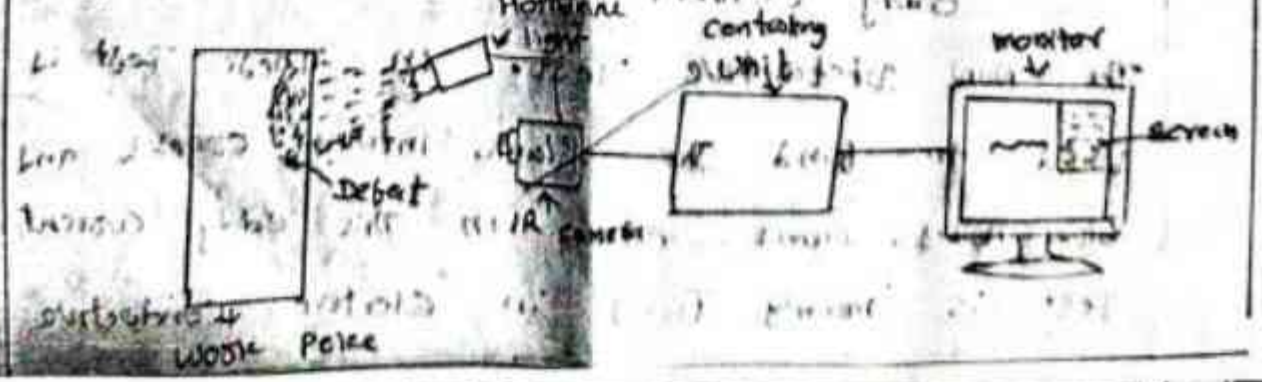



The electrical current is passing Through The conductive coil. Then The electro magnetic field was developed to The coil surroundings. The magnetic field was passing Through the metal. The eddy current was developed on work Peice. The eddy current was detect The Defects. It visible by Infrared screen.

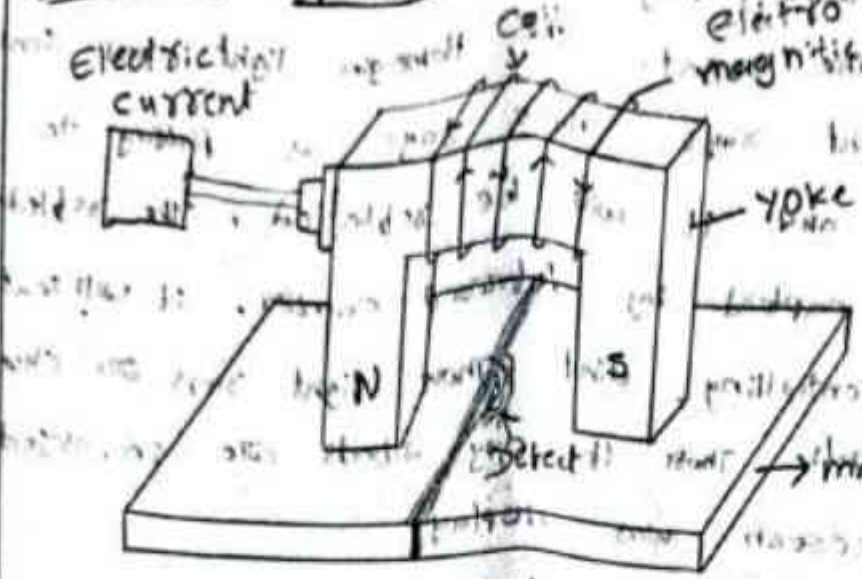
3] Active and passive Techniques

Active Technique:-

This is The Technique which is used in Thermography Testing. Thermography Test is The on of The NON Destructive Test.



(2) Magnetic particle Testi-




magnetic partical Test is mainly porform in conductive materials Only. Those materials are classified in to three types. There are.

1] magnetic materials
2] Para magnetic materials
3] Demagnetic materials

Testing procedure:-

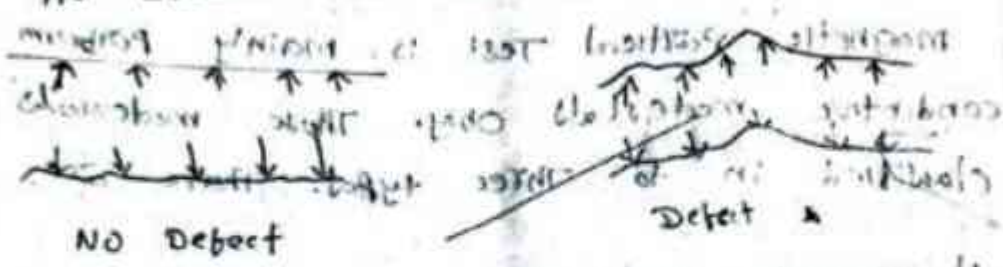
magnetic partical Test is Conducted in six processes. They are

1] surface cleaning
2] Initial demagnetisation
3] Demagnetisation
4] magnetic partical Test Applications
5] Inspection
6] Result

(1) surface cleaning:-

Initially the object surface was cleaning through water and Remove Rust and Dust particles

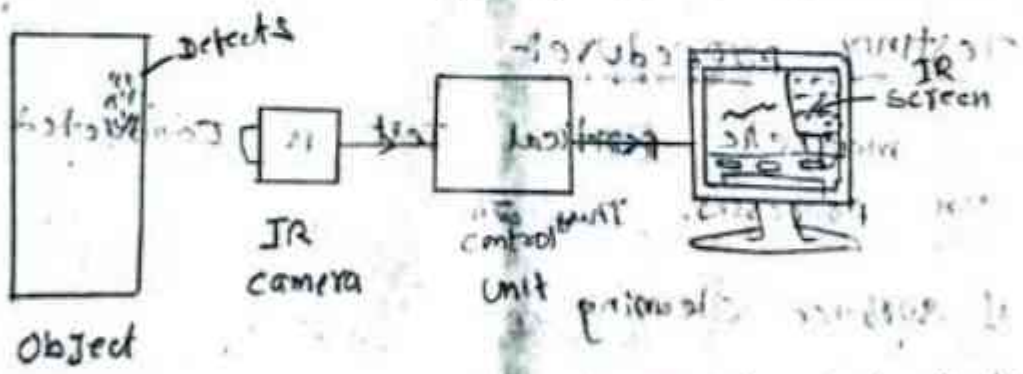
In This Thermography Test is mainly absorb the Heat to the object. The thermogire light send to the light rays. These rays as pulling to the object and it will be reflected. The reflected rays are captred by infrared camera. it will sent to the controlling unit those light rays are change in to signals. Then it any defects are in object the IR screen was duplay.



NO Defect

Defect

**Passive Technique:-**




In This Techique is used in Thermography Test. In This parsive Techique is doesn't need any essential light source. The Natural light is absorbed on the object. The Object emits Reflected in the form of Heat. The Heat was captured on infrared camera. The Object having any defects like internal Cracks, blow holes, Seams, porosity ..etc.. are Detected

identified manually.

(b) Degreasing:-

Degreseing means the elimination of oil or grease on the material surface. If any dust or grease on the surface it will effect to the Test Result.

(2) Initial Demagnetisation:-

The magnetic yoke are have attraction property to the metals. So the initially current was sent into magnets. Then the magnets are loosing their attraction property. in gradually.

(3) Demagnetisation:-

The magnetic properties are loosing Then magnets on sending to the current in magnets and another method is used to reduce the demagnetisation. The method is induction method

(4) Applications of MPT.

- gas Pipe lines
- Boiler Pipes
- Welding Joints

(5) Inspection:-

The Powder was spray on the surface of the work piece. if any defects are in object. There the powder was indicates the magnetic lines. In the defects are identified manually.

| | Regd. No | UHV2 R2041011 | | UMP R2041031 | | PPE R2041041 | | NDE R2041051 | | SE R2041061 | | DM R2041071 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 1 | 20H41A0301 | 20 | 26 | 15 | 15 | 9 | 12 | 10 | 11 | 10 | 13 | 12 | 12 |
| 2 | 20H41A0302 | 25 | 10 | 15 | 15 | 10 | 11 | 07 | 8 | 11 | 15 | 14 | 10 |
| 3 | 20H41A0303 | 25 | 10 | 12 | 14 | 3 | 12 | 08 | 10 | 06 | 12 | 12 | 09 |
| 4 | 20H41A0305 | 0 | 10 | 07 | 12 | A | 07 | A | | 04 | 10 | A | 0 |
| 5 | 20H41A0307 | A | 10 | A | 13 | 0 | | A | | A | 12 | A | 10 |
| 6 | 20H41A0308 | 18 | 10 | 07 | 14 | 0 | | A | | 06 | 12 | A | 10 |
| 7 | 20H41A0309 | 20 | 10 | 14 | 13 | 0 | | A | | 07 | A | A | 5 |
| 8 | 20H41A0310 | 24 | 12 | 15 | 14 | 8 | 12 | 07 | 06 | 07 | 11 | 12 | 10 |
| 9 | 20H41A0311 | 20 | 12 | 15 | 14 | 0 | 09 | A | 06 | 09 | 11 | A | 11 |
| 10 | 20H41A0312 | 26 | 10 | 12 | 14 | 8 | 12 | A | 07 | 07 | 11 | A | 9 |
| 11 | 20H41A0313 | 28 | 10 | 14 | 14 | 0 | 07 | 07 | 05 | 08 | 10 | 9 | 11 |
| 12 | 21H45A0301 | 24 | 28 | 15 | 15 | 04 | 15 | 08 | 12 | 07 | 14 | 11 | 13 |
| 13 | 21H45A0302 | 23 | 24 | 15 | 15 | 12 | 14 | 10 | 12 | 11 | 14 | 11 | 14 |
| 14 | 21H45A0303 | 28 | 24 | 15 | 15 | | 14 | 10 | 12 | 10 | 13 | 13 | 14 |
| 15 | 21H45A0304 | 24 | 16 | 15 | 15 | 10 | 14 | 11 | 11 | 12 | 11 | 12 | 9 |
| 16 | 21H45A0305 | 24 | 26 | 15 | 15 | 13 | 13 | 12 | 13 | 12 | 13 | 14 | 9 |
| 17 | 21H45A0306 | 24 | 26 | 15 | 15 | 11 | 14 | 11 | 04 | 12 | 12 | 13 | 13 |
| 18 | 21H45A0307 | 23 | 24 | 14 | 15 | 14 | 15 | 11 | 12 | 06 | 14 | 11 | 10 |
| 19 | 21H45A0308 | 22 | 24 | 15 | 15 | 10 | 14 | 09 | 12 | 07 | 13 | 9 | 14 |
| 20 | 21H45A0309 | 23 | 24 | 15 | 15 | 14 | 15 | 11 | 11 | 10 | 10 | 11 | 12 |
| 21 | 21H45A0310 | 22 | 10 | 15 | 14 | 10 | 12 | 10 | 13 | 10 | 09 | 10 | 11 |
| 22 | 21H45A0311 | 20 | 11 | 15 | 15 | 14 | 15 | 11 | 10 | 08 | 12 | 12 | 14 |
| 23 | 21H45A0312 | 18 | 10 | 14 | 15 | 03 | 10 | A | 09 | 02 | 09 | 12 | 08 |
| 24 | 21H45A0313 | 5 | 24 | 15 | 15 | 14 | 12 | 12 | 15 | 11 | 14 | 10 | 12 |
| 25 | 21H45A0314 | 20 | 18 | 13 | 14 | 13 | 05 | 09 | 12 | 07 | 09 | 9 | 07 |
| 26 | 21H45A0315 | 19 | 14 | 07 | 15 | 08 | 14 | 05 | 12 | 05 | 12 | 12 | 13 |
| 27 | 21H45A0316 | 22 | 20 | 15 | 15 | 08 | 12 | 11 | 13 | 07 | 11 | 13 | 12 |
| 28 | 21H45A0317 | 22 | 18 | 15 | 15 | 08 | 13 | 11 | 11 | 08 | 11 | 14 | 13 |
| 29 | 21H45A0318 | 20 | 26 | 15 | 15 | 05 | 11 | A | 11 | 09 | 12 | 11 | 13 |

| S. No | Regd. No | UHV2 R2041013 | | UMP R2041036 | | PPE R2041081 | | NDE R2041063 | | SE R2041062 | | DM R2041072 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid max 15 | 2mid max 15 | 1mid max 15 | 2mid max 15 | 1mid max 15 | 2mid max 15 | 1mid max 15 | 2mid max 15 | 1mid max 15 | 2mid max 15 | 1mid max 15 | 2mid max 15 |
| 1 | 21H45A0319 | 19 | 22 | 15 | 15 | 11 | 15 | 10 | 09 | 07 | 13 | 10 | 12 |
| 2 | 21H45A0320 | 24 | 26 | 15 | 15 | 14 | 12 | 12 | 11 | 10 | 13 | 12 | 12 |
| 3 | 21H45A0321 | 24 | 24 | 15 | 15 | 10 | 09 | 10 | 11 | 09 | 13 | 13 | 12 |
| 4 | 21H45A0322 | 20 | 10 | 07 | 10 | 01 | 05 | 05 | 02 | 03 | 08 | 7 | 06 |
| 5 | 21H45A0323 | 22 | 22 | 13 | 15 | 07 | 12 | 12 | 14 | 08 | 11 | 11 | 11 |
| 6 | 21H45A0324 | 22 | 24 | 14 | 15 | 12 | 12 | 12 | 12 | 05 | 11 | 11 | 12 |
| 7 | 21H45A0325 | 21 | 26 | 15 | 15 | 10 | 12 | 09 | 12 | 07 | 12 | 11 | 10 |
| 8 | 21H45A0326 | 25 | 22 | 15 | 15 | 10 | 11 | 11 | 13 | 06 | 10 | 10 | 10 |
| 9 | 21H45A0327 | 21 | 26 | 15 | 15 | 13 | 13 | 11 | 14 | 10 | 15 | 14 | 13 |
| 10 | 21H45A0328 | 10 | 22 | 14 | 15 | 08 | 12 | 08 | 13 | 09 | 10 | 9 | 11 |
| 11 | 21H45A0329 | 0 | 10 | 14 | 14 | 10 | 12 | 08 | 12 | 08 | 12 | 12 | 11 |
| 12 | 21H45A0330 | 16 | 22 | 15 | 15 | 12 | 12 | 10 | 11 | 08 | 12 | 11 | 14 |
| 13 | 21H45A0331 | 22 | 24 | 15 | 15 | 12 | 12 | 10 | 13 | 08 | 12 | 10 | 13 |
| 14 | 21H45A0332 | 23 | 28 | 15 | 15 | 13 | 14 | 12 | 14 | 11 | 12 | 10 | 12 |
| 15 | 21H45A0333 | 23 | 28 | 15 | 15 | 13 | 11 | 11 | 13 | 08 | 11 | 10 | 13 |
| 16 | 21H45A0334 | 24 | 18 | 13 | 15 | 04 | 10 | A | 07 | 05 | 10 | A | 11 |
| 17 | 21H45A0335 | 19 | 26 | 14 | 15 | 10 | 15 | 10 | 11 | 08 | 12 | A | 13 |
| 18 | 21H45A0336 | 19 | 22 | 15 | 15 | 09 | 10 | 10 | 11 | 09 | 10 | 10 | 11 |
| 19 | 21H45A0337 | 23 | 26 | 14 | 15 | 19 | 15 | 10 | 14 | 09 | 11 | 9 | 12 |
| 20 | 21H45A0338 | 22 | 28 | 14 | 15 | 13 | 13 | 09 | 14 | 08 | 13 | 11 | 13 |
| 21 | 21H45A0339 | 22 | 24 | 15 | 15 | 05 | 14 | 10 | 14 | 08 | 11 | 11 | 09 |

Sign of the Faculty:

Dept. Incharge | H.O.D | Exams Incharge | Principal

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

BVC INSTITUTE OF TECHNOLOGY & SCIENCE * AMALAPURAM

| | Regd. No | UHV2 R2041011 | | UMP R2041031 | | PPE R20410311 | | NDE R2041031J | | SE R2041031J | | DM R2041031V | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 1 | 20H41A0301 | 20 | 26 | 15 | 15 | 9 | 12 | 10 | 11 | 10 | 13 | 12 | 12 |
| 2 | 20H41A0302 | 25 | 10 | 15 | 15 | 10 | 11 | 7 | 8 | 11 | 15 | 14 | 10 |
| 3 | 20H41A0303 | 25 | 10 | 12 | 14 | 3 | 12 | 8 | 10 | 6 | 12 | 12 | 9 |
| 4 | 20H41A0305 | 0 | 10 | 7 | 12 | -1 | 7 | -1 | -1 | 4 | 10 | -1 | 0 |
| 5 | 20H41A0307 | 10 | 10 | -1 | 13 | 0 | -1 | -1 | -1 | -1 | 12 | -1 | 10 |
| 6 | 20H41A0308 | 13 | 10 | 7 | 14 | 0 | -1 | -1 | -1 | 6 | 12 | -1 | 10 |
| 7 | 20H41A0309 | 20 | 10 | 14 | 13 | 0 | -1 | -1 | -1 | 7 | -1 | -1 | 5 |
| 8 | 20H41A0310 | 24 | 12 | 15 | 14 | 8 | 12 | 7 | 6 | 7 | 11 | 12 | 10 |
| 9 | 20H41A0311 | 20 | 12 | 15 | 14 | 0 | 9 | -1 | 6 | 9 | 11 | -1 | 11 |
| 10 | 20H41A0312 | 26 | 10 | 12 | 14 | 2 | 12 | -1 | 7 | 7 | 11 | -1 | 9 |
| 11 | 20H41A0313 | 28 | 10 | 14 | 14 | 0 | 7 | 7 | 5 | 8 | 10 | 9 | 11 |
| 12 | 21H45A0301 | 24 | 28 | 15 | 15 | 4 | 15 | 8 | 12 | 7 | 14 | 11 | 13 |
| 13 | 21H45A0302 | 23 | 24 | 15 | 15 | 11 | 14 | 10 | 12 | 11 | 14 | 11 | 14 |
| 14 | 21H45A0303 | 23 | 24 | 15 | 15 | -1 | 14 | 10 | 12 | 10 | 13 | 13 | 14 |
| 15 | 21H45A0304 | 24 | 16 | 15 | 15 | 10 | 14 | 11 | 11 | 12 | 11 | 12 | 9 |
| 16 | 21H45A0305 | 24 | 26 | 15 | 15 | 13 | 13 | 12 | 13 | 12 | 13 | 14 | 9 |
| 17 | 21H45A0306 | 24 | 26 | 15 | 15 | 11 | 14 | 11 | 4 | 12 | 12 | 13 | 13 |
| 18 | 21H45A0307 | 23 | 24 | 14 | 15 | 14 | 15 | 11 | 12 | 6 | 14 | 11 | 10 |
| 19 | 21H45A0308 | 22 | 24 | 15 | 15 | 10 | 14 | 9 | 12 | 7 | 13 | 9 | 14 |
| 20 | 21H45A0309 | 23 | 24 | 15 | 15 | 14 | 15 | 11 | 11 | 10 | 10 | 11 | 12 |
| 21 | 21H45A0310 | 22 | 10 | 15 | 14 | 10 | 12 | 10 | 13 | 10 | 9 | 10 | 11 |
| 22 | 21H45A0311 | 20 | 11 | 15 | 15 | 14 | 15 | 11 | 10 | 8 | 12 | 12 | 14 |
| 23 | 21H45A0312 | 18 | 10 | 14 | 15 | 3 | 10 | -1 | 9 | 2 | 9 | 12 | 8 |
| 24 | 21H45A0313 | 6 | 24 | 15 | 15 | 14 | 12 | 12 | 15 | 11 | 14 | 10 | 12 |
| 25 | 21H45A0314 | 20 | 18 | 13 | 14 | 13 | 5 | 9 | 12 | 7 | 9 | 9 | 7 |
| 26 | 21H45A0315 | 19 | 14 | 7 | 15 | 8 | 14 | 5 | 12 | 5 | 12 | 12 | 13 |
| 27 | 21H45A0316 | 22 | 20 | 15 | 15 | 8 | 12 | 11 | 13 | 7 | 11 | 13 | 12 |
| 28 | 21H45A0317 | 22 | 18 | 15 | 15 | 8 | 13 | 11 | 11 | 8 | 11 | 14 | 13 |
| 29 | 21H45A0318 | 20 | 26 | 15 | 15 | 5 | 11 | -1 | 11 | 9 | 12 | 11 | 13 |

PRINCIPAL
Institute of Technology & Science
AMALAPURAM - 533 201

| S. No | Regd. No | UHV2 R2041011 | | UMP R20410SC | | PPE R2041031 | | NDE R204103Q | | SE R204101Q | | DM R204101V | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 1 | 21H45A0319 | 22 | 22 | 15 | 15 | 11 | 15 | 10 | 9 | 7 | 13 | 10 | 12 |
| 2 | 21H45A0320 | 26 | 26 | 15 | 15 | 14 | 12 | 12 | 11 | 10 | 13 | 12 | 12 |
| 3 | 21H45A0321 | 26 | 24 | 15 | 15 | 10 | 9 | 10 | 11 | 7 | 13 | 13 | 12 |
| 4 | 21H45A0322 | 20 | 10 | 7 | 10 | 1 | 5 | 5 | 2 | 3 | 8 | 7 | 6 |
| 5 | 21H45A0323 | 26 | 22 | 13 | 15 | 7 | 12 | 12 | 14 | 8 | 11 | 11 | 11 |
| 6 | 21H45A0324 | 24 | 24 | 14 | 15 | 12 | 12 | 12 | 12 | 5 | 11 | 11 | 12 |
| 7 | 21H45A0325 | 24 | 26 | 15 | 15 | 10 | 12 | 9 | 12 | 7 | 12 | 11 | 10 |
| 8 | 21H45A0326 | 25 | 22 | 15 | 15 | 10 | 11 | 11 | 13 | 6 | 10 | 10 | 10 |
| 9 | 21H45A0327 | 21 | 26 | 15 | 15 | 13 | 13 | 11 | 14 | 10 | 15 | 14 | 13 |
| 10 | 21H45A0328 | 10 | 22 | 14 | 14 | 8 | 12 | 8 | 13 | 9 | 10 | 9 | 11 |
| 11 | 21H45A0329 | 10 | 22 | 14 | 15 | 10 | 12 | 8 | 12 | 8 | 12 | 12 | 11 |
| 12 | 21H45A0330 | 16 | 22 | 15 | 15 | 12 | 12 | 10 | 11 | 8 | 12 | 11 | 14 |
| 13 | 21H45A0331 | 22 | 24 | 15 | 15 | 12 | 12 | 10 | 13 | 8 | 12 | 10 | 13 |
| 14 | 21H45A0332 | 23 | 28 | 15 | 15 | 13 | 14 | 12 | 14 | 11 | 12 | 10 | 12 |
| 15 | 21H45A0333 | 23 | 28 | 15 | 15 | 13 | 11 | 11 | 13 | 8 | 11 | 10 | 13 |
| 16 | 21H45A0334 | 24 | 18 | 13 | 15 | 4 | 10 | -1 | 7 | 5 | 10 | -1 | 11 |
| 17 | 21H45A0335 | 19 | 26 | 14 | 15 | 10 | 15 | 10 | 11 | 8 | 12 | -1 | 13 |
| 18 | 21H45A0336 | 19 | 22 | 15 | 15 | 9 | 10 | 10 | 11 | 9 | 10 | 10 | 11 |
| 19 | 21H45A0337 | 23 | 26 | 14 | 15 | 14 | 15 | 10 | 14 | 9 | 11 | 9 | 12 |
| 20 | 21H45A0338 | 22 | 28 | 14 | 15 | 13 | 13 | 9 | 14 | 8 | 13 | 11 | 13 |
| 21 | 21H45A0339 | 22 | 24 | 15 | 15 | 5 | 14 | 10 | 14 | 8 | 11 | 11 | 9 |

Sign of the Faculty:

Dept. Exams Incharge

Exams Incharge

Principal

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

# BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

## Department of Electronics and Communication Engineering

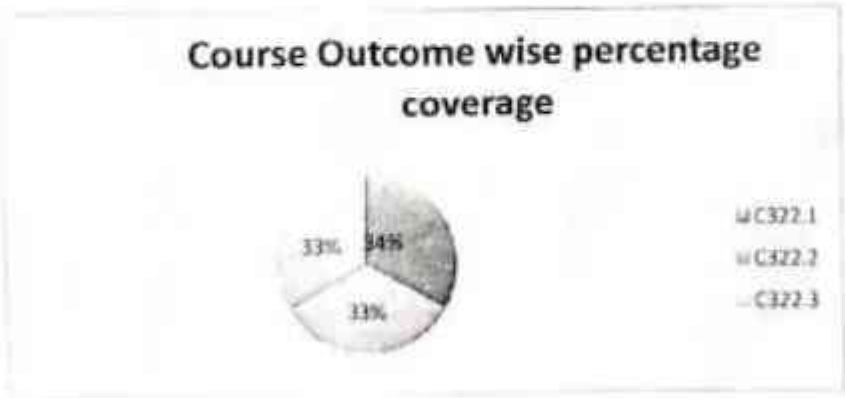
A.Y: 2022-23 MID-1

Course:VLSID Max Marks: 15

Branch: ECE Year: III Semester: I Duration: 1 1/2Hr

| Q.No | Questions | Makrs | CO | BL |
|---|---|---|---|---|
| 1 | 1. Draw the circuit for NMOS inverter and explain its operation and characteristics. Determine pull-up to pull-down ratio of an NMOS inverter when driven another NMOS inverter | 5M | C322.1 | L3 |
| 2 | Calculate Delays for The Fallowing Inverters<br>a) NMOS inverter pair. ----------2M<br>b) CMOS inverter pair. ----------3M | 5M | C322.2 | L3 |
| 3 | Draw the circuit diagram of single stage amplifier and calculate voltage gain with<br>a) Resistive load ----------2M<br>b) Diode connected load [without body effect and [with body effect] ----3M | 5M | C322.3 | L3 |






BL – Bloom's Taxonomy Levels (L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analysing, L5 – Evaluating, L6 Creating)

CO – Course Outcomes

**Faculty Signature**

BVC INSTITUTE OF TECHNOLOGY & SCIENCE AMALAPURAM

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM - 533 221
(Via) Amalapuram, DR.B.R.A.K.Dist.

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE**

**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

Course Name: VLSI DESIGN

Year / Sem: IIIB.Tech/II Sem

AY: 2023-2024

Faculty Name: P.Girish

Course Code: C322

**SCHEME OF EVALUATION WITH CO AND BT MAPPING**

| Q.No | Questions | Marks | CO | BL |
|---|---|---|---|---|
| 1 | Draw the circuit for NMOS inverter and explain its operation and characteristics. Determine pull-up to pull-down ratio of an NMOS inverter when driven another NMOS inverter. | 5M | C322.1 | Apply |
| 2 | . Calculate Delays for The Fallowing Inverters<br>a) NMOS inverter pair. ----------**2M**<br>b) CMOS inverter pair. ----------**3M** | 5M | C322.2 | Understand |
| 3 | Draw the circuit diagram of single stage amplifier and calculate voltage gain with<br>a) Resistive load ----------**2M**<br>b) Diode connected load [without body effect and [with body effect] ----**3M** | 5M | C322.3 | Analyze |

1 . Draw the circuit for NMOS inverter and explain its operation and characteristics. Determine pull-up to pull-down ratio of an NMOS inverter when driven another NMOS inverter.

1. Diagram: .....1M
2. Explanation: .....2M
3. Derivation:.....2M

2. Calculate Delays for The Fallowing Inverters

a) NMOS inverter pair. ----------**2M**

b) CMOS inverter pair. ----------**3M**

3. Draw the circuit diagram of single stage amplifier and calculate voltage gain with

a) Resistive load ----------**2M**

b) Diode connected load [without body effect and [with body effect] ----**3M**

**Faculty Signature**

BVC Institute of Technology & Science
BATLAPALEM - 533 221
(Via) Amalapuram, DR.B.R.A.K.Dist.

Name: G. L. Anusri  Regd.: 21H41A0417  Date: 21-02-24  No. of Addls.:
Subject: VLSI  Class/Course: ECE-A(3-2)  Invigilator Sign:

Verified by G. L Anusri

1.Ac- NMOS Inverters

* A basic requirement for producing complex range of logic circuits is an inverter. These are needed in restoring the logic levels, for NAND and NOR gates, sequential and memory logics for various forms.
* For a basic NMOS inverter, we require a transistor which is given from source to ground and load resistor is given from drain to supply $V_{DD}$. The output is taken at drain and inputs are in between gate and ground.
* Resistors are not convienently in the silicon substrate due to it occupies more space (large area). For that we require a another type of load resistance. The convinient way to solve the problem is depletion mode transistor is used as load.

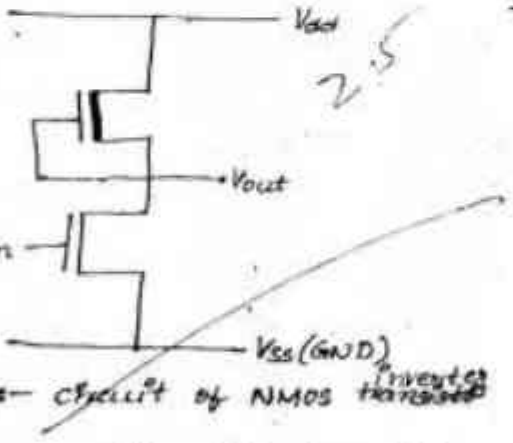
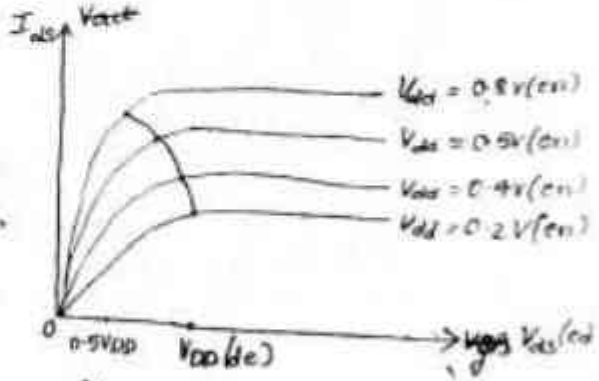



fig- Circuit of NMOS transistor inverter




$V_{ds(en)} = V_{DD} - V_{ds(dep)} = V_{in}$

$V_{DD(dep)} = V_{out}$

fig- Derivation for NMOS transfer characteristics

* Current $I_{ds}$ for transistor inverter is equal.
* By shown in the figure, enhancement mode device is known as pull-up and depletion mode device is known as pull-down inverter.

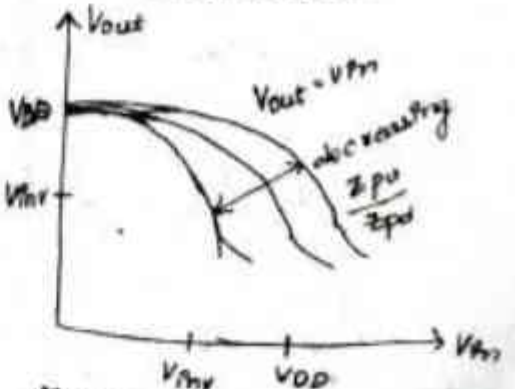



fig- Transfer function

Determining the pull-up to pull-down ratio of an NMOS Inverter when driven another NMOS Inverter.

* To determine the pull-up to pull-down ratio of an NMOS Inverter when driven another NMOS Inverter.


Current $I_{ds} = k \frac{w}{L} \frac{(V_{gs} - V_t)^2}{2}$

For enhancement mode transistor

$$I_{ds} = k \frac{w_{pd}}{L_{pd}} \frac{(V_{gs} - V_t)^2}{2}$$

where $V_{gs} = V_{in} = V_{inv}$

$$I_{ds} = k \frac{w_{pd}}{L_{pd}} \frac{(V_{inv} - V_t)^2}{2} \rightarrow (1)$$

For depletion mode transistor

$$I_{ds} = k \frac{w_{pu}}{L_{pu}} \frac{(V_{gs} - V_t)^2}{2}$$

where $V_{gs} = 0$, $V_t = V_{td}$

$$I_{ds} = k \frac{w_{pu}}{L_{pu}} \frac{(-V_{td})^2}{2} \rightarrow (2)$$

From (1) & (2)

$$k \frac{w_{pd}}{L_{pd}} \frac{(V_{inv} - V_t)^2}{2} = k \frac{w_{pu}}{L_{pu}} \frac{(-V_{td})^2}{2}$$

$$\frac{1}{Z_{pd}} (V_{inv} - V_t)^2 = \frac{1}{Z_{pu}} (V_{td})^2 \qquad \left[\because \frac{L}{W} = Z\right]$$

$$\boxed{\frac{Z_{pu}}{Z_{pd}} = \frac{V_{td}^2}{(V_{inv} - V_t)^2}}$$

Let us consider

$V_{td} = -0.6\ V_{dd}$

$V_{inv} = 0.8\ V_{dd}$

$V_t = 0.5\ V_{dd}$

$$\frac{Z_{pu}}{Z_{pd}} = \frac{(-0.6)^2}{(0.2 - 0.5)^2}$$

$$\frac{Z_{pu}}{Z_{pd}} = \frac{4}{1}$$

$$\boxed{Z_{pu} : Z_{pd} = 4:1}$$

∴ So the NMOS Inverter is driven another NMOS Inverter

2 a) NMOS Inverter pair delay:

The NMOS Inverter is having a output of Inverter 1 is connected to Input of Inverter 2. the NMOS Inverter pair delay is having a 4:1 ratio. the $Z_{pd}$ is having longest number as 4 when the $Z_{pu}$ is having less transistor.

$R_{pd} = 4R_s = 40k\Omega$

where, as for $R_{pu}$ is having $1R_s = 10k\Omega$.

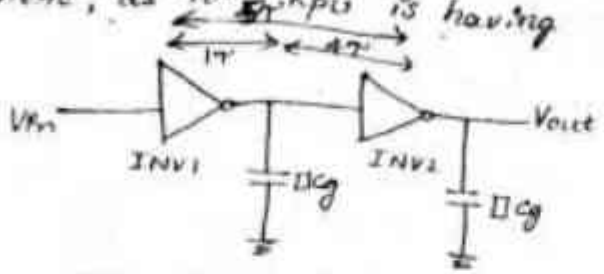
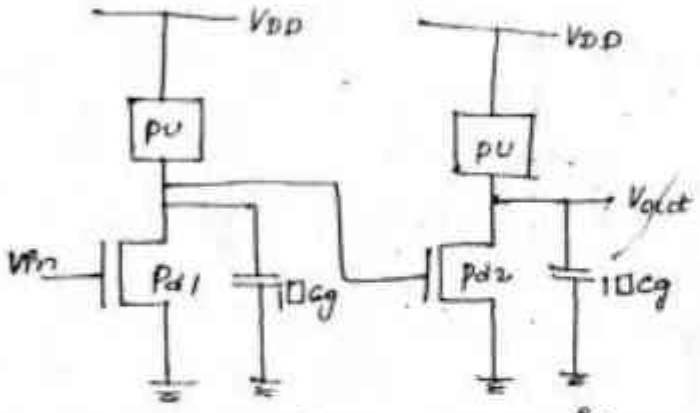



fig- NMOS Inverter pair delay.




* At $V_{in} = 0$ then, $Pd_1$ is in off state then due to pull-up Inverter capacitance ($C_g$) is charging.
* At $V_{in} = 1$ then $pd_1$ is in ON state, due to $pd_1$ capacitance ($C_g$) is discharging.

$T_1 = Z_{pd} 1\square C_g$

$T_2 = Z_{pu} 1\square C_g$

$T_{tot} = T_1 + T_2 = Z_{pd} 1\square C_g + Z_{pu} 1\square C_g$

$= Z_{pd} 1\square C_g \left[1 + \frac{Z_{pu}}{Z_{pd}} 1\square C_g\right]$

where $\frac{Z_{pu}}{Z_{pd}} = \frac{4}{1}$

$= Z_{pd} 1\square C_g [1 + 4]$

$= Z_{pd} 1\square C_g [5]$ $(\because T = Z_{pd} 1\square C_g)$

$\boxed{T_{tot} = 5T}$ $\therefore$ For NMOS Inverter pair delay $T_{tot} = 5T$

(b) CMOS Inverter pair-

* In CMOS Inverter pair, the NMOS Inverter pair delay condition is not necessary they both are completely different.

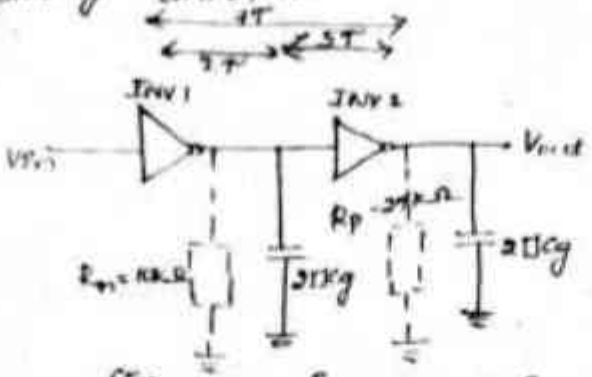
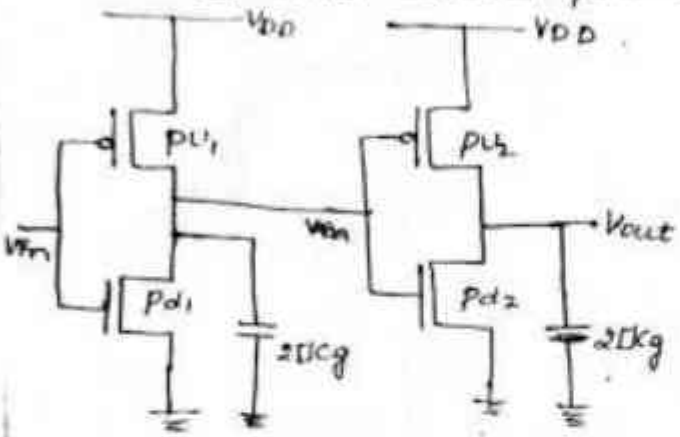



fig- CMOS Inverter pair delay




$T_1 = Z_{pd}\, 2\square C_g$

$T_2 = Z_{pu}\, 2\square C_g$

$Z_{pd} = R_n = 10k\Omega$

$Z_{pu} = R_p = 25k\Omega$

$\frac{Z_{pd}}{Z_{pu}} = \frac{25k\Omega}{10k\Omega} = 2.5k\Omega$.

$\frac{Z_{pd}}{Z_{pu}} = \frac{R_n}{R_p} = 2.5k\Omega \Rightarrow R_p = 2.5k\Omega R_n$

$T_{tot} = T_1 + T_2 = Z_{pd}\, 2\square C_g + Z_{pu}\, 2\square C_g$

$= R_n\, 2\square C_g + R_p\, 2\square C_g$

$= R_n\, 2\square C_g + 2.5\Omega R_n\, 2\square C_g$

$= R_n\, 2\square C_g\, [1 + 2.5 \times 2]$

$= R_n \square C_g\, [7]$

$T_{tot} = 7T$ $\quad (\because T = R_n \square C_g)$

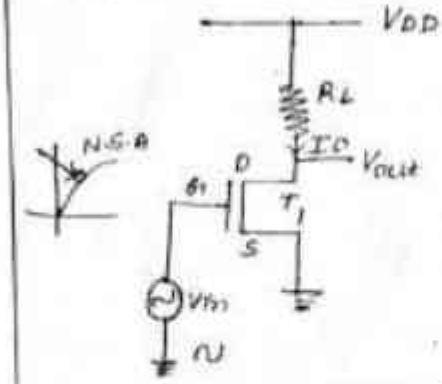
∴ For CMOS Inverter pair delay $T_{tot} = 7T$.

Name: G. L. Anusri Class / Course: 21HA1D0417 Date: 27.12.24
Regd No: VLSI Subject: ECE-A (3-1) Invigilator Sign:

3.Ac- Common Source Stage:-

(a) Common source stage with resistive load-

* The common source stage is finding using a resistive load.
* The circuit diagram of common source stage is shown in the below figure.



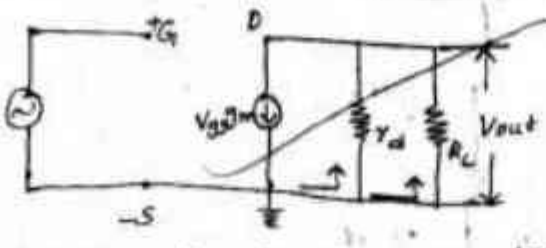

* when $V_{in} = 0$ then $T_1$ will be in OFF stage the output $V_{out} = V_{DD}$.
* when $V_{in} > V_{th}$ then $T_1$ will be in non-saturation condition. Then the output $V_{out} = V_{DD} - I_D R_D$

$$I_D = k\frac{w}{L}\left(V_{gs} - V_{th}\right)V_{ds} - \frac{V_{ds}^2}{2}$$

$$\boxed{V_{out} = V_{DD} - \left[k\frac{w}{L}\left(V_{gs} - V_{th}\right)V_{ds} - \frac{V_{ds}^2}{2}\right]R_D}$$

* when $V_{in}$ still increases, then $T_1$ will be in saturation condition.

then the output $\boxed{V_{out} = V_{DD} - \left[k\frac{w}{L}\frac{(V_{gs} - V_{th})^2}{2}\right]R_D}$




To find $A_V$, $Z_i$, $Z_o$ when take $Z_{in} = \infty$.

Gain($A_V$) = $V_{out}/V_{in}$

$V_{out} = -g_m V_{gs}(r_d \| R_L)$

$V_{gs} = V_{in}$

$V_{out} = -g_m V_{in} (r_d \| R_L)$

$\frac{V_{out}}{V_{in}} = -g_m (r_d \| R_L)$

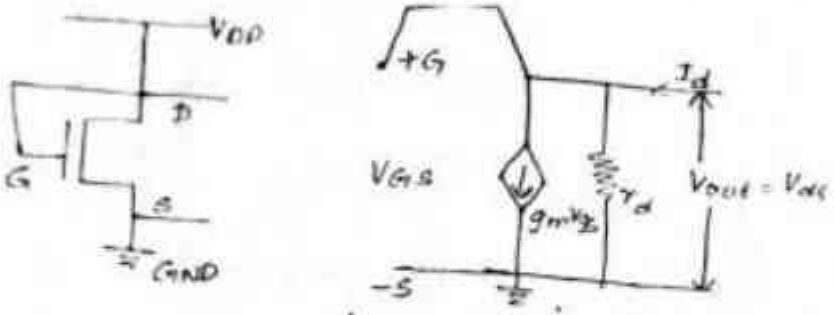
$$\boxed{A_v = -g_m (r_d \| R_L)}$$

$Z_i = \infty$

$$\boxed{Z_o = r_d \| R_L}$$

b) Diode connected load-

- Common source stage with diode connected load- resistive load and diode fabrication (nmos).




$I_d = g_m v_{gs} + \frac{V_{ds}}{r_d}$

Shortage (G-D Terminal)

$V_{ds} = V_{gs}$

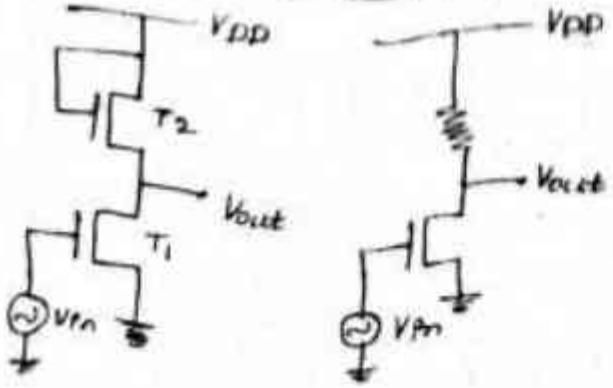
$I_d = g_m V_{ds} + \frac{V_{ds}}{r_d}$

$I_d = V_{ds} \left[ g_m + \frac{1}{r_d} \right]$

$\frac{I_d}{V_{ds}} = g_m + \frac{1}{r_d}$ $(\because V_{ds} = V_{gs})$

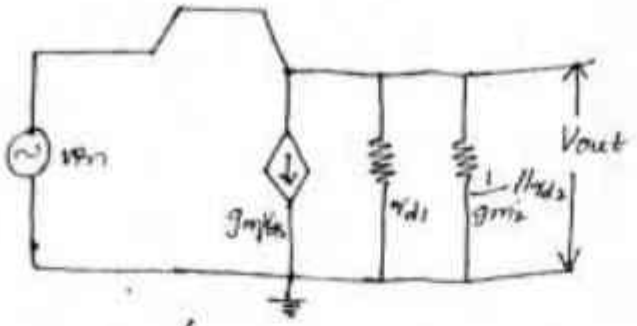
$\frac{I_d}{V_{gs}} = g_m + \frac{1}{r_d}$

$$\boxed{R_L = \frac{1}{g_m} \| r_d}$$



Name: G. L. Anusha  Class / Course: ECE-A (3-2)  Date: 27.08.24
Regd No: 417  Subject: VLSI  Invigilator Sign:

3




$$V_{out} = -g_m V_{gs} \left( r_{d1} \,||\, \frac{1}{g_{m2}} \,||\, r_{d2} \right)$$

$$V_g = V_{in}$$

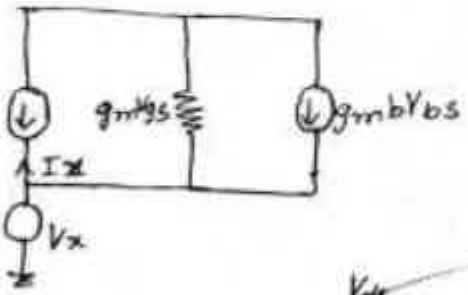
$$V_{out} = -g_m V_{in} \left( r_{d1} \,||\, \frac{1}{g_{m2}} \,||\, r_{d2} \right)$$

$$\frac{V_{out}}{V_{in}} = -g_m \left( r_{d1} \,||\, \frac{1}{g_{m2}} \,||\, r_{d2} \right)$$

$$A_V = -g_m \left( r_{d1} \,||\, \frac{1}{g_{m2}} \,||\, r_{d2} \right)$$

$$Z_i = \infty \Rightarrow \boxed{Z_o = r_{d1} \,||\, \frac{1}{g_{m2}} \,||\, r_{d2}}$$

Common source stage with diode connected load using body effect




$$I_x = g_m V_{gs} + \frac{V_{ds}}{r_d} + g_{mb} V_{bs}$$

$$V_{gs} = V_{ds} = V_{bs} = V_x$$

$$I_x = g_m V_x + \frac{V_x}{r_d} + g_{mb} V_x$$

$$I_x = V_x \left[ g_m + \frac{1}{r_d} + g_{mb} \right]$$

$$\frac{V_x}{I_x} = \frac{1}{g_m + \frac{1}{r_d} + g_{mb}}$$

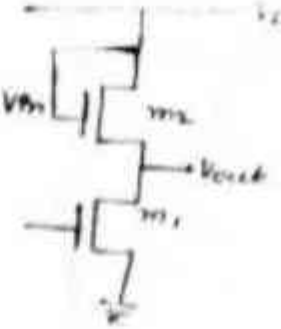
$$R_o = \frac{1}{g_m + g_{mb} + r_d^{-1}}$$

Voltage gain:

$A_v = -g_{m1} R_D$

$= -g_{m1} \left[ \frac{1}{g_{m2} + g_{mb2}} \right] V_{in}$

$\boxed{A_v = \frac{g_{m1}}{g_{m2}} \left[ \frac{1}{1+\eta} \right]}$




Drain current:

$A_v = \frac{-\sqrt{2 \mu_n C_{ox} \left(\frac{W}{L}\right)_1 I_{D1}}}{-\sqrt{2 \mu_n C_{ox} \left(\frac{W}{L}\right)_2 I_{D2}}} \times I_{D2} \left[ \frac{1}{1+\eta} \right]$

$I_{D2}$ [ $\Rightarrow I_{D1} = I_{D2}$

$\boxed{A_v = \sqrt{\left(\frac{W}{L}\right)_1 / \left(\frac{W}{L}\right)_2} \left( \frac{1}{1+\eta} \right)}$

3

| S. No | Regd. No | MP MC R2032041 | | VLSI D R2032042 | | DSP R2032043 | | M W E R2032048 | | C N R2032058 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 1 | 216M1A04B6 | 10 | 13 | 15 | 12 | 15 | 15 | 9 | 13 | 12 | 11 |
| 2 | 21H41A0401 | 6 | 12 | 10 | 13 | 15 | 5 | 9 | 13 | 12 | 11 |
| 3 | 21H41A0402 | 8 | 11 | 13 | 14 | 15 | 15 | 8 | 12 | 13 | 12 |
| 4 | 21H41A0403 | 12 | 11 | 13 | 10 | 10 | 14 | 8 | 15 | 14 | 12 |
| 5 | 21H41A0404 | 12 | 12 | 15 | 13 | 15 | 14 | 12 | 14 | 14 | 9 |
| 6 | 21H41A0405 | 5 | (8)12 | 4 | 12 | 15 | 15 | 8 | 11 | 6 | 8 |
| 7 | 21H41A0406 | 13 | 11 | 15 | 14 | 15 | 15 | 12 | 13 | 15 | 14 |
| 8 | 21H41A0407 | 12 | 12 | 15 | 11 | 15 | 15 | 14 | 15 | 15 | 9 |
| 9 | 21H41A0408 | 12 | 12 | 14 | -1 | 14 | 15 | 12 | -1 | 12 | 8 |
| 10 | 21H41A0409 | 4 | (8)10 | 3 | (-1)10 | 15 | 12 | 10 | -1 | 8 | -1 |
| 11 | 21H41A0410 | 5 | 12 | 11 | 13 | 13 | 13 | 11 | -1 | -1 | 13 |
| 12 | 21H41A0411 | 8 | 11 | 15 | 8 | 15 | 15 | 10 | 12 | 13 | 14 |
| 13 | 21H41A0412 | 4 | (8)10 | 13 | 6 | 15 | 12 | 11 | -1 | 10 | 13 |
| 14 | 21H41A0413 | 4 | 13 | 15 | -1 | 13 | 15 | 11 | -1 | 13 | 7 |
| 15 | 21H41A0414 | 13 | 11 | 13 | 12 | 15 | 15 | 12 | 15 | 13 | 14 |
| 16 | 21H41A0415 | 4 | -1 | 9 | 10 | 13 | 12 | 10 | -1 | 6 | 9 |
| 17 | 21H41A0416 | 9 | 12 | 8 | 6 | 15 | 10 | 8 | 10 | 12 | 11 |
| 18 | 21H41A0417 | 10 | 12 | 15 | 12 | 15 | 13 | 14 | 15 | 15 | 13 |
| 19 | 21H41A0418 | 5 | 10 | 9 | 7 | 14 | 12 | 8 | (-1)10 | 15 | 9 |
| 20 | 21H41A0419 | 9 | 13 | 14 | 10 | 15 | 14 | 11 | 11 | 15 | 14 |
| 21 | 21H41A0420 | 1 | 9 | 12(0) | -1 | 13 | (15)10 | 10 | -1 | 7 | 12 |
| 22 | 21H41A0421 | 7 | 12 | 15 | 11 | 15 | 15 | 12 | -1 | 15 | 14 |
| 23 | 21H41A0422 | 11 | 12 | 14 | 15 | 15 | 15 | -1 | 15 | 14 | 14 |
| 24 | 21H41A0424 | 10(2) | -1 | 12(0) | -1 | 13 | 14 | -1 | (-1)10 | 5 | 8 |
| 25 | 21H41A0425 | 12 | 12 | 10 | 14 | 15 | 15 | 10 | 13 | 13 | 14 |
| 26 | 21H41A0426 | 14 | 11 | 12 | 12 | 15 | 15 | 8 | (-1)10 | 14 | 10 |
| 27 | 21H41A0427 | 5 | 12 | 10 | 11 | 12 | 14 | 10 | 11 | 5 | 10 |
| 28 | 21H41A0428 | 8 | 11 | 5 | 13 | 15 | 13 | 11 | 14 | 5 | 9 |
| 29 | 21H41A0429 | 10 | 11 | 8 | 13 | 15 | 15 | 10 | 14 | 11 | 11 |

(66)

BVC INSTITUTE OF TECHNOLOGY & SCIENCE AMALAPURAM

BVC Institute of Technology & Science
BATLAPALEM - 533 211
(Via) Amalapuram, DR.B.R.A.K.Dist.

| S No | Regd. No | MP MC R2032041 | | VLSI D R2032042 | | DSP R2032043 | | M W E R2032045 | | C N R2032058 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 1 | 21H41A04B9 | 9 | 12 | 15 | 11 | 14 | 15 | 13 | 15 | 13 | 11 |
| 2 | 21H41A04C1 | 9 | 13 | 14 | 12 | 13 | 15 | 9 | 13 | 9 | 11 |
| 3 | 21H41A04C2 | 2 | 6 | 13 | 3 | 12 | 13 | 10 | 12 | -1 | 11 |
| 4 | 21H41A04C3 | 11 | 13 | 14 | 15 | 15 | 10 | 9 | 13 | 14 | 12 |
| 5 | 21H41A04C4 | (-1)10 | -1 | 10(4) | -1 | 13 | (-1)13 | -1 | (-1)11 | (-1)0 | 3 |
| 6 | 21H41A04C5 | 6 | 8 | 13(2) | 6 | 14 | 15 | 10 | 11 | 2 | 12(-1) |
| 7 | 21H41A04C6 | 9 | 12 | 14 | 14 | 15 | 15 | 12 | 12 | 8 | 11 |
| 8 | 21H41A04C8 | 7 | 11 | 10 | 13 | 15 | 15 | 10 | 14 | 2 | 13 |
| 9 | 21H41A04D1 | (-1)10 | 2 | 9(0) | -1 | 11 | (-1)12 | -1 | (-1)11 | (-1)12 | -1 |
| 10 | 21H41A04D2 | 7 | 12 | 12 | 7 | 15 | 15 | 13 | 13 | 9 | 11 |
| 11 | 22H45A0401 | 13 | 8 | 14 | 9 | 15 | 15 | 9 | 11 | 13 | 7 |
| 12 | 22H45A0402 | 11 | 8 | 11 | 5 | 15 | 15 | 7 | 10 | 12 | 5 |
| 13 | 22H45A0403 | 10 | 7 | 7 | 7 | 14 | 15 | 9 | 10 | 10 | 7 |
| 14 | 22H45A0404 | 4 | 6 | 10 | 9 | 12 | 14 | 9 | 10 | 10 | 7 |
| 15 | 22H45A0405 | 6 | 10 | 12 | 10 | 15 | 15 | 7 | 10 | 13 | 10 |
| 16 | 22H45A0406 | 11 | 11 | 15 | 15 | 15 | 15 | 11 | 11 | 13 | 10 |
| 17 | 22H45A0407 | (-1)10 | 5 | 7 | 9 | 15 | 15 | 10 | 8 | 12 | 7 |
| 18 | 22H45A0408 | 12 | 12 | 15 | 14 | 15 | 15 | 11 | 11 | 12 | 12 |
| 19 | 22H45A0409 | 13 | 10 | 14 | 12 | 15 | 15 | 10 | 12 | 14 | 13 |
| 20 | 22H45A0410 | 6 | 12 | 12 | 13 | 15 | 15 | 12 | 11 | 7 | 6 |
| 21 | 22H45A0411 | 12 | 13 | 15 | 13 | 15 | 15 | 13 | 12 | 14 | 13 |
| 22 | 22H45A0412 | 9 | 12 | 14 | 13 | 14 | 15 | 9 | 10 | 13 | 10 |

Signature of the Faculty:

Dept. Exams Incharge HOD Exams Incharge Principal

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 204

BVC INSTITUTE OF TECHNOLOGY & SCIENCE AMALAPURAM

Principal
BVC Institute of Technology & Science
BATLAPALEM - 533 204
(Via) Amalapuram, DR.B.R.A.K.Dist.

# B V C INSTITUTE OF TECHNOLOGY & SCIENCE :: BATLAPALEM

MID EXAM - I | **III B TECH I SEM - CSE** | SUB: DWDM

TIME: 9.30 to 11.00 am | DATE 21.09.2023 | MAX MARKS: **15**

**ANSWER ALL THE QUESTIONS.**

1. Differentiate Operational database systems and data warehousing. **(C313.1-Analyzing)**
2. Given the following data (in increasing order) for the attribute age: **(C313.2-Applying)**

   13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70.

   (i) Use min-max normalization to transform the value 35 for age onto the range [0.0,1.0].
   (ii) Use z-score normalization to transform the value 35 for age, where the standard deviation of age is 12.94 years.
   (iii) Use normalization by decimal scaling to transform the value 35 for age.
3. What is attribute selection measure. Briefly describe the attribute selection measures for decision tree induction. **(C313.3-Applying)**

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE**

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## Scheme of Evaluation With CO and BT Mapping

Course : DATA WAREHOUSING AND DATA MINING(C313)
Class: III B.Tech I Sem Mid Examination-1
AY: 2023-24

**SCHEME OF EVALUATION WITH CO AND BT MAPPING**

| SNO | QUESTION | CO | BT |
|---|---|---|---|
| 1. | Differentiate Operational database systems and data warehousing. | C313.1 | Apply |
| 2 | Given the following data (in increasing order) for the attribute age:<br>13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70.<br>(i) Use min-max normalization to transform the value 35 for age onto the range [0.0,1.0].<br>(ii) Use z-score normalization to transform the value 35 for age, where the standard deviation of age is 12.94 years.<br>(iii) Use normalization by decimal scaling to transform the value 35 for age. | C313.2 | Analyze |
| 3 | What is attribute selection measure. Briefly describe the attribute selection measures for decision tree induction. | C313.3 | Apply |

1. Differentiate Operational database systems and data warehousing.

**Ans:** Define OLAP and OLTP(1M)

Any 8 differences between OLAP and OLTP (4M)

2. Given the following data (in increasing order) for the attribute age:
13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70.
(i) Use min-max normalization to transform the value 35 for age onto the range [0.0,1.0].
(ii) Use z-score normalization to transform the value 35 for age, where the standard

deviation of age is 12.94 years.
(iii) Use normalization by decimal scaling to transform the value 35 for age.

**Ans:**

i) Min-Max Normalization with formula-2M

ii) Z-Score Normalization with formula-2M

iii) Normalization by Decimal scaling-1M

3. What is attribute selection measure. Briefly describe the attribute selection measures for decision tree induction.

**Ans:** Define Attribute selection measure-1M

Information Gain-2M

Gain Ration-1M

Gini Index-1M

D. Sudheera
**Faculty**

# BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

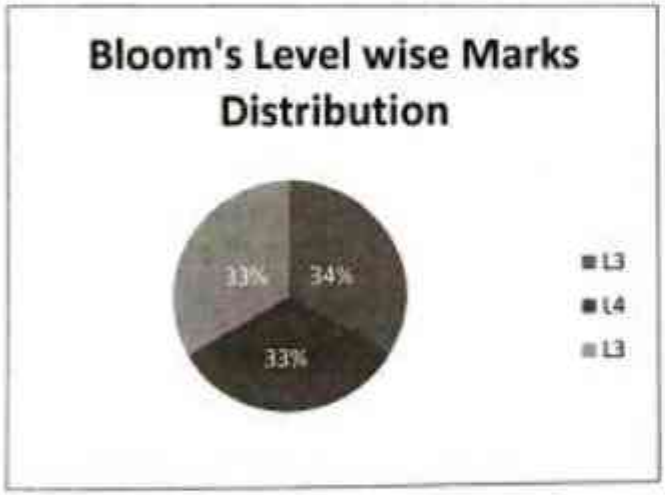
## Department of Computer Science & Engineering

A.Y: 2023-24

Course: Data Warehousing and Data Mining(MID - 1) Max Marks: 15

Branch: CSE Year: III Semester: I Duration: 1 Hr 30 Mins

| Q.No | Questions | Makrs | CO | BL |
|---|---|---|---|---|
| 1 | Differentiate Operational database systems and data warehousing. | 5 | C313.1 | L3 |
| 2 | Given the following data (in increasing order) for the attribute age: 13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70.<br>(i) Use min-max normalization to transform the value 35 for age onto the range [0.0,1.0].<br>(ii) Use z-score normalization to transform the value 35 for age, where the standard deviation of age is 12.94 years.<br>(iii) Use normalization by decimal scaling to transform the value 35 for age. | 5 | C313.2 | L4 |
| 3 | What is attribute selection measure. Briefly describe the attribute selection measures for decision tree induction. | 5 | C313.3 | L3 |





BL – Bloom's Taxonomy Levels (L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analysing, L5 – Evaluating, L6 - Creating)

CO – Course Outcomes

C313.1: Outline the Importance of Data Warehousing and Features of Data Mining(Understand)
C313.2: Demonstrate data Preprocessing Techniques and process raw data to make it suitable for Data mining.(Apply)
C313.3: Apply decision tree classification techniques for data analysis.(Apply)

FACULTY

# BVC INSTITUTE OF TECHNOLOGY & SCIENCE, AMALAPURAM

MAIN ANSWER SCRIPT

4+5+5 Verified by 14 15 A. Gayathri

Name : A. Lalitha Gayathri Regd. : 21N41A0505 Date : 21/9/23 No. of Addl. :

Subject : DMDW Class / Course : III B.Tech ISCM Invigilator Sign :

(1) A) Differences between operational database systems and data warehousing:-

| Feature | OLTP | OLAP |
|---|---|---|
| Full form | Online Transactional Processing | Online analytical processing |
| characterization | processed in a transactional way | processed in a analytical way. |
| Orientation | Transaction | Analysis of information |
| user | clerk, database design, software professions | Knowledgable persons in analytical processing |
| Function | E-R based function will be done | Subject oriented function will be done (star/snowflake) |
| DB design | It will be designed in application oriented | It will be designed in information-oriented. |
| Data | It will be in short and simple forms | It has complex queries. |
| Summarization | Predictive, Summarized | Summarized, consolidated |
| View | Having in simple data bases | Summarized and multidimensional user views |
| Unit of work | current, guaranteed | Historical work |

| Accen | Data in | Information out |
|---|---|---|
| Focus | How data is transferred in transactional procesing | How data that infam out using analytical procesing |
| Operations | It perfoams index and high operations | It perfoamy simple queries only. |
| User | Read/write will perform | Read only mostly perform. |
| Number of records accened | tons | millions |
| Number of users | Thousands | hundreds. |
| DB site | 100 MB to GB | 100 GB to TB |
| Performance | Having high performance due to the simple and shot database | Having low performance due to the complex queries |
| Priority | High performance, high flexibility | high informational, end use autonomy |
| Metric | Transaction throughput, and guaranteed transaction procesing | information throughput and response time |
| information storing | In this information will be stored as database relational tables | In this information will be stored as complex queries. |

(M) Given,

13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30,
33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70.

(i) min-max normalization to transform the value 35 for age onto the range [0.0, 1.0]:-

$v_i = 35$

$min_A = 13$

$max_A = 70$

$new\ max_A = 1.0$

$new\ min_A = 0.0$

$$v_i' = \frac{v_i - min_A}{max_A - min_A}\left[new\ max_A - new\ min_A\right] + new\ min_A$$

$$= \frac{35 - 13}{70 - 13}\left[1.0 - 0.0\right] + 0.0$$

$$= \frac{22}{57}[1]$$

$$= 0.385$$

(ii) Use Z-score normalization to transform the value 35 for age, when the Standard deviation of age is 12.94 years.

$v_i = 35$

$\bar{A} = 12.94$

$$v_i' = \frac{v_i - \bar{A}}{\bar{A}}$$

$$\bar{A} = \frac{13+15+16+16+19+20+20+21+22+22+25+25+25+25+30+33+33+35+35+35+35+36+40+45+46+52+70}{}$$

$= \frac{809}{27} = 29.96$

$= 29.9$

$\approx 30.$

$v_i' = \frac{v_i - \bar{A}}{\sigma_A} = \frac{35 - 29.96}{12.94} = 0.3894$

$= \frac{35 - 30}{12.94} = \frac{5}{12.94} = 0.386$

$\therefore v_i' = 0.389$

(iii) Normalization by decimal scaling to transform the value 35 for age.

$v_i = 35$

$j = 2$ (Here $v_i = 35$ (2) decimals so, $j = 2$).

$v_i' = \frac{v_i}{10^j}$

$= \frac{35}{10^2}$

$= \frac{35}{100}$

$= 0.35$

(3) A) Attribute Selection measure:-

* Attribute selection measure is used to calculate the attribute test conditions of decision tree based on the training set.
* Attribute selection measure contains three kinds of measures. (1) Information Gain
  (2) Gain ratio
  (3) Gini Index

Attribute selection measures for decision tree induction:-

* Decision tree induction means the proces of learning decision tree based from the training set.
* Training set contains attributes and class labels.
* It has 3 selection measures:-
  (1) Information Gain
  (2) Gain ratio
  (3) Gini Index.

(1) Information Gain:-

* The ID3 algorithm makes use of the measure called information Gain.
* As it attribute selection measure decision tree get used to calculate information gain
* The excess of information gain is used to specify the measure of selection on of tuples 'D' will be estimated as:-

$$Info(D) = -\sum_{i=1}^{m} P_i \log_2 P_i$$

Where, $P_i = |C_i, D| / |D|$

m is the no. of distinct values

$P_i$ is the non-zero probability that has arbitory tuple which belongs to class $C_i$.

* Information gain is also called the entropy of 'D'.

* In some cases we need to partition the attribute A in the tuple D having n distinct values is represented as :- $(A_1, A_2, \ldots A_n)$

* The Information Gain of that particular attribute A of tuple 'D' we can be estimated as :-

$$Info_A(D) = \sum_{j=1}^{v} \frac{|D_j|}{|D|} \times Info(D_j)$$

* The information Gain will be defined as difference between Original information of requirements and after partition on A of the information requirements :-

$$\therefore Gain(A) = Info(D) - Info_A(D).$$

(ii) Gain ratio :-

* Gain ratio is the one of the attribute selection measure for decision tree induction.

* Gain ratio is the extension of the information gain.

* Gain ratio will overcome the problem of the information gain which is if the text contains many many text it will be calculated.

* To solve this, it apply some kind of the normalization to overcome that problem.

P.T.O.

* We use the splitting method to normalize the information gain in gain ratio.

* It will estimated as:-

$$SplitInfo_A(D) = -\sum_{i=1}^{v} \frac{|D_j|}{|D|} \times \log_2 \frac{|D_j|}{|D|}$$

* Therefore gain ratio will be defined as:-

$$GainRatio(D) = \frac{Gain(A)}{SplitInfo_A(D)}$$

(iii) Gini Index :-

* Gini index is the one of the attribute selection measures for decision tree induction.

* Gini index is used to calculate the impurity of D which is represented as:-

$$Gini(D) = 1 - \sum_{i=1}^{n} P_i^2$$

where,

$P_i$ is the probability of tuples

n is the no of distinct values

$P_i = |C_i, D| / |D|$

D = tuples

P.T.O.

* Gini index is used to do binary splitting because it supports only binary splitting

Example:-

{low, medium, highy}

Subsets-

(i) {low, medium} and {high}

(ii) {low, high} and {medium}

(iii) {medium, high} and {low}

* Gini index is used to support binary splitting and least attribute is selected as attribute measure.

* In Gini index the attribute are divided into partitions if the attribute measure is 0 (zero) then the D is divided into partitions such as $D_1, D_2, \ldots D_n$

$$Gini_A(D) = \frac{|D_1|}{|D|} Gini(D_1) + \frac{|D_2|}{|D|} Gini(D_2) + \ldots\ldots$$

| Regd. No | CN R2031051 | | DAA R2031052 | | DWDM R2031053 | | FMM R2031041 | | SPM R203105B | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 21H41A0501 | 8 | 12 | -1 | 11 | -1 | 12 | 10 | 15 | 15 | 15 |
| 21H41A0502 | 10 | 12 | 8 | 10 | 12 | 10 | 10 | 13 | 15 | 14 |
| 21H41A0503 | 13 | 14 | 14 | 15 | 14 | 14 | 15 | 15 | 15 | 15 |
| 21H41A0504 | 13 | 13 | 11 | 15 | 14 | 14 | 15 | 14 | 15 | 15 |
| 21H41A0505 | 14 | 15 | 12 | 15 | 14 | 14 | 15 | 15 | 15 | 15 |
| 21H41A0506 | 14 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 |
| 21H41A0507 | 12 | 13 | 10 | 11 | 10 | 12 | 12 | 14 | 15 | 15 |
| 21H41A0508 | 11 | 13 | 13 | 13 | 11 | 14 | 13 | 15 | 15 | 15 |
| 21H41A0509 | 15 | 15 | 14 | 15 | 15 | 14 | 15 | 15 | 15 | 15 |
| 21H41A0510 | 7 | 12 | 10 | 12 | 9 | 12 | 12 | 13 | 15 | 15 |
| 21H41A0511 | 8 | 13 | 8 | 12 | 11 | 14 | 11 | 11 | 15 | 14 |
| 21H41A0512 | 3 | 8 | 6 | 9 | 4 | 8 | 5 | 11 | 13 | 15 |
| 21H41A0513 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| 21H41A0514 | 14 | 12 | 15 | 15 | 8 | 14 | 15 | 14 | 15 | 15 |
| 21H41A0515 | 12 | 11 | 14 | 15 | 15 | 13 | 15 | 14 | 15 | 15 |
| 21H41A0516 | 14 | 13 | 14 | 14 | 14 | 15 | 15 | 14 | 15 | 15 |
| 21H41A0517 | 13 | 13 | 12 | 14 | 12 | 8 | 11 | 15 | 15 | 14 |
| 21H41A0518 | 12 | 12 | 10 | 13 | 9 | 12 | 11 | 15 | 15 | 15 |
| 21H41A0519 | 13 | 13 | 13 | 11 | 12 | 13 | 12 | 15 | 15 | 15 |
| 21H41A0520 | 10 | 9 | 13 | 12 | 12 | 12 | 12 | 9 | 15 | 15 |
| 21H41A0521 | 13 | 12 | 11 | 15 | 14 | 13 | 12 | 9 | 15 | 15 |
| 21H41A0522 | 8 | 12 | 9 | 11 | 7 | 7 | 11 | 12 | 13 | 13 |
| 21H41A0523 | 12 | 12 | 11 | 12 | 13 | 12 | 8 | 15 | 15 | 15 |
| 21H41A0524 | 9 | 13 | 13 | 13 | 13 | 13 | 12 | 12 | 15 | 14 |
| 21H41A0525 | 14 | 15 | 13 | 12 | 9 | 10 | 12 | 15 | 15 | 15 |
| 21H41A0526 | 11 | 11 | 10 | 12 | 14 | 9 | 12 | 13 | 15 | 15 |
| 21H41A0527 | 10 | 12 | 10 | 12 | 11 | 10 | 9 | 11 | 15 | 15 |
| 21H41A0528 | 10 | 9 | 11 | 10 | 12 | 13 | 13 | 9 | 15 | 10 |
| 21H41A0529 | 14 | 14 | 14 | 14 | 13 | 13 | 15 | 15 | 15 | 15 |
| 21H41A0530 | 9 | 15 | 10 | 12 | 13 | 13 | 14 | 15 | 15 | 15 |

(67)

| S.No | Regd. No | CN R2031051 | | DAA R2031052 | | DWDM R2031053 | | FMM R2031041 | | SPM R203105B | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 109 | 21H41A05C1 | 13 | 13 | 11 | 13 | 14 | 14 | 14 | 15 | 15 | 15 |
| 110 | 21H41A05C2 | 15 | 15 | 13 | 15 | 14 | 15 | 15 | 15 | 15 | 15 |
| 111 | 21H41A05C4 | 9 | 7 | 1 | 6 | 8 | 8 | 10 | 10 | 15 | 15 |
| 114 | 21H41A05C5 | 11 | 10 | 8 | 13 | 13 | 11 | 12 | 9 | 15 | 15 |
| 115 | 21H41A05C6 | 7 | 8 | 6 | 6 | 10 | 10 | 8 | 10 | 15 | 13 |
| 116 | 21H41A05C7 | 10 | 12 | 9 | 9 | 14 | 9 | 5 | 14 | 14 | 14 |
| 117 | 21H41A05C8 | 13 | 14 | 10 | 12 | 11 | 10 | 14 | 15 | 15 | 15 |
| 118 | 21H41A05D0 | 13 | 14 | 11 | 10 | 10 | 10 | 12 | 9 | 15 | 15 |
| 120 | 22H45A0501 | 12 | 12 | 11 | 11 | 10 | 12 | 13 | 15 | 15 | 15 |
| 130 | 22H45A0502 | 5 | 8 | 7 | 6 | 12 | 10 | 11 | 9 | 10 | 15 |
| 131 | 22H45A0503 | 3 | 12 | 8 | 11 | 12 | 14 | 11 | 15 | 14 | 15 |
| 132 | 22H45A0504 | 6 | 5 | 0 | 4 | 9 | 8 | 12 | 10 | 9 | 15 |
| 133 | 22H45A0505 | 4 | 7 | 3 | 2 | 9 | 10 | 11 | 12 | 15 | 15 |
| 134 | 22H45A0506 | 4 | 6 | 10 | 9 | 8 | 10 | 12 | 13 | 13 | 15 |
| 135 | 22H45A0507 | 3 | 7 | 3 | 3 | 8 | 9 | 11 | 5 | 13 | 15 |
| 136 | 22H45A0508 | 13 | 15 | 13 | 14 | 13 | 13 | 15 | 15 | 15 | 15 |
| 137 | 22H45A0509 | 12 | 14 | 13 | 12 | 11 | 13 | 15 | 13 | 15 | 15 |
| 138 | 22H45A0510 | 14 | 14 | 13 | 13 | 14 | 13 | 15 | 15 | 15 | 15 |
| 139 | 22H45A0511 | 14 | 15 | 10 | 13 | 13 | 12 | 15 | 15 | 15 | 15 |
| 140 | 22H45A0512 | 12 | 15 | 13 | 11 | 14 | 13 | 14 | 15 | 15 | 15 |
| 141 | 22H45A0513 | 8 | 14 | 12 | 11 | 11 | 15 | 12 | 15 | 15 | 15 |

| S.No | Regd. No | CN R2031051 | | DAA R2031052 | | DWDM R2031053 | | OR R203103H | | SPM R203105B | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 142 | 216M1A0501 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |

Signature of the Faculty:

Dept. Exams Incharge HOD Exams Incharge Principal

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE**

**DEPARTMENT OF CSE-ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**

Course Name: BIG DATA ANALYTICS

Year / Sem: IIIB.Tech/II Sem

AY: 2023-2024

Faculty Name: K Nagendra

Course Code: C322

**SCHEME OF EVALUATION WITH CO AND BT MAPPING**

| SNO | QUESTION | CO | BT |
|---|---|---|---|
| 1. | 1. Explain briefly about BDA and types of Big data with examples | C322.1 | UNDERSTAND |
| 2 | 2 .what is Data Stream and Explain briefly about Flajolet Martin algorithm with an example | C322.2 | APPLY |
| 3 | what is HDFS.Explain the architecture of HDFS? | C322.3 | UNDERSTAND |

1. Explain briefly about BDA and types of Big data with examples
   1.explanation about BDA-2M
   2.Types of Big data with examples-3M

2. what is Data Stream and Explain briefly about Flajolet Martin algorithm with an example
   1.definition about Data stream-1M
   2.Flajolet martin algorithm procedure-2M
   3.Flajolet martin algorithm explanation-2M

3. what is HDFS.Explain the architecture of HDFS?
   1.Usage of Hadoop distributed file system explantion 2M
   2.Architecture and its internal components explanation 3M

Faculty Signature

PRINCIPAL
BVC Institute of Technology & Science
BAILAPUDI, AMALAPURAM-533 201

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

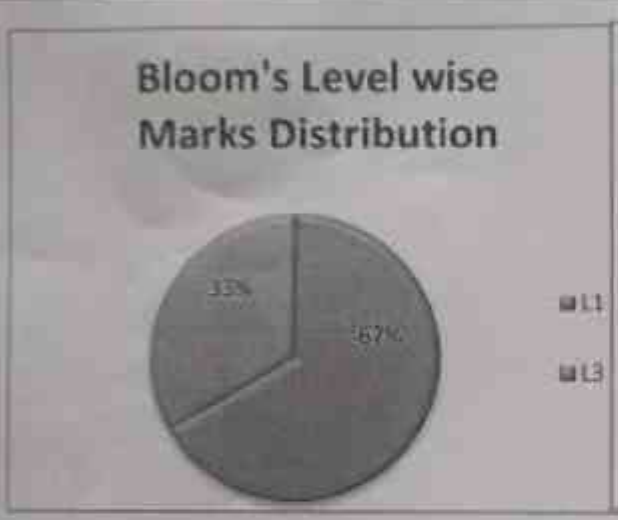
Department of CSE-ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

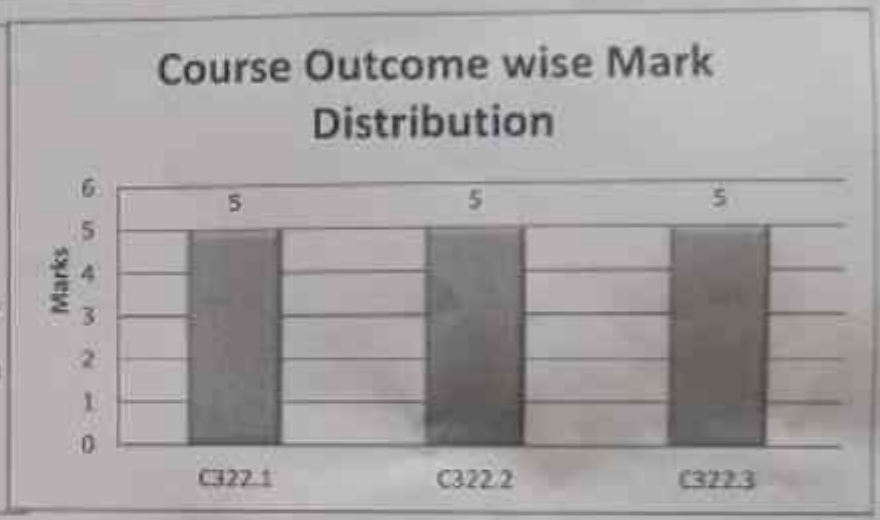
A.Y: 2023-24 MID-1

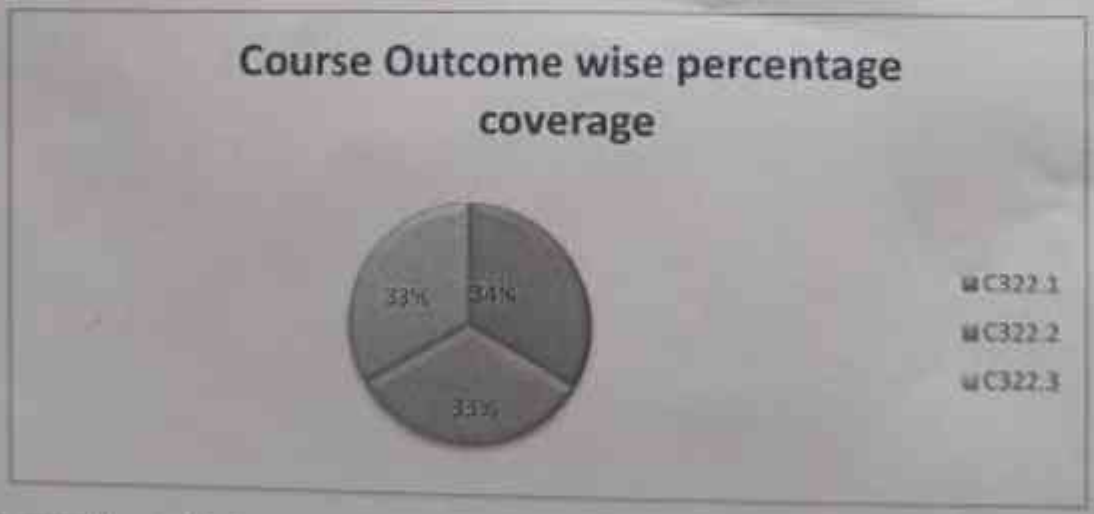
Course: Big Data Analytics Max Marks: 15

Branch: CSE-AI&DS Year: III Semester: II Duration: 1 1/2Hr

| Q.No | Questions | Marks | CO | BL |
|---|---|---|---|---|
| 1 | Explain briefly about BDA and types of Big data with examples | 5 | C322.1 | L1 |
| 2 | what is Data Stream and Explain briefly about Flajolet Martin algorithm with an example | 5 | C322.2 | L3 |
| 3 | what is HDFS.Explain the architecture of HDFS? | 5 | C322.3 | L1 |




BL – Bloom's Taxonomy Levels (L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analysing, L5 – Evaluating, L6 - Creating)

CO – Course Outcomes

Faculty Signature

PRINCIPAL

BVC Institute of Technology & Science

BATLAPALEM, AMALAPURAM - 533 201

| | Reg. No | BT | | BDA | | CSE | | DAA | | DAI | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| 1 | 21H41A4501 | 13 | 14 | 14 | 13 | 10 | 14 | 13 | 12 | 13 | 15 |
| 2 | 21H41A4502 | 14 | 11 | 12 | 13 | 11 | 13 | 8 | 10 | 12 | 12 |
| 3 | 21H41A4503 | 12 | 6 | 13 | 12 | 10 | 11 | 5 | 11 | 12 | 11 |
| 4 | 21H41A4504 | 11 | 7 | 13 | 10 | 9 | 11 | 13 | 14 | 12 | 11 |
| 5 | 21H41A4505 | 12 | 15 | 13 | 15 | 14 | 15 | 14 | 15 | 12 | 15 |
| 6 | 21H41A4506 | 15 | 15 | 14 | 15 | 14 | 15 | 15 | 14 | 14 | 15 |
| 7 | 21H41A4507 | 13 | 7 | 11 | 9 | 9 | 9 | 11 | 9 | 10 | 12 |
| 8 | 21H41A4508 | 11 | 9 | 10 | 13 | 10 | 9 | 10 | 12 | 10 | 12 |
| 9 | 21H41A4509 | 11 | 8 | 9 | 9 | 9 | 5 | 5 | 12 | 8 | (8) 11 |
| 10 | 21H41A4510 | 15 | 15 | 15 | 14 | 15 | 15 | 15 | 12 | 15 | 15 |
| 11 | 21H41A4511 | 13 | 14 | 13 | 14 | 14 | 14 | 12 | 13 | (15) 14 | 15 |
| 12 | 21H41A4512 | 11 | 8 | 12 | 10 | 9 | 9 | 8 | 12 | 8 | (7) 13 |
| 13 | 21H41A4513 | 10 | 12 | 12 | 15 | 10 | 12 | 7 | 12 | 14 | 13 |
| 14 | 21H41A4514 | 8 | 7 | 8 | 10 | 8 | 8 | 6 | 12 | 5 | 10 |
| 15 | 21H41A4515 | 12 | 7 | 10 | 9 | 7 | 10 | 6 | 14 | 10 | 11 |
| 16 | 21H41A4516 | 8 | 10 | 9 | 10 | 9 | 8 | 4 | 12 | 11 | 5 |
| 17 | 21H41A4517 | 15 | 9 | 14 | 14 | 14 | 13 | 14 | 11 | 13 | 13 |
| 18 | 21H41A4518 | 14 | 12 | 14 | 14 | 12 | 12 | 7 | 11 | 13 | 13 |
| 19 | 21H41A4519 | 14 | 9 | 14 | 14 | 13 | 13 | 12 | 10 | 12 | 12 |
| 20 | 21H41A4520 | 14 | 12 | 12 | 14 | 12 | 14 | 12 | 12 | 14 | 11 |
| 21 | 21H41A4521 | 14 | 13 | 14 | 15 | 14 | 14 | 12 | 13 | 14 | 15 |
| 22 | 21H41A4522 | 9 | 5 | 12 | 9 | 7 | 10 | 3 | 11 | 13 | 11 |
| 23 | 21H41A4523 | 13 | 14 | 13 | 14 | 13 | 14 | 13 | 14 | 12 | 14 |
| 24 | 21H41A4524 | 15 | 15 | 14 | 15 | 14 | 14 | 14 | 13 | 14 | 15 |
| 25 | 21H41A4525 | 15 | 15 | 15 | 15 | 13 | 14 | 14 | 15 | 15 | 15 |
| 26 | 21H41A4526 | 14 | 15 | 13 | 14 | 14 | 14 | 11 | 15 | 15 | 14 |
| 27 | 21H41A4527 | 11 | 14 | 10 | 12 | 11 | 13 | 11 | 10 | 14 | 14 |
| 28 | 21H41A4528 | 3 | 12 | 8 | 9 | 3 | 12 | 5 | 10 | 5 | (6) 13 |
| 29 | 21H41A4529 | 13 | 13 | 10 | 13 | 9 | 12 | 9 | 12 | 10 | 11 |

| Sr. No | Regd. No | BE R2032304P | | BDA R-032333 | | CN R2032421 | | DAA R2032421 | | DL R2032416 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid min 15 | 2mid min 15 | 1mid min 15 | 2mid min 15 | 1mid min 15 | 2mid min 15 | 1mid min 15 | 2mid min 15 | 1mid min 15 | 2mid min 15 |
| 41 | 21H41A4561 | 8 | 8 | 8 | 14 | 12 | 6 | 13 | 1 | 10 | 15 |
| 42 | 21H41A4562 | 14 | 10 | 13 | 13 | 9 | 9 | 11 | 11 | 12 | 10 |
| 43 | 21H41A4563 | A | 13 | 9 | 13 | 4 | 7 | 6 | 9 | 10 | 10 |
| 44 | 21H41A4564 | 15 | 14 | 12 | 15 | 14 | 13 | 14 | 11 | 14 | 13 |
| 45 | 21H41A4565 | 15 | 15 | 15 | 15 | 14 | 14 | 15 | 15 | 15 | 14 |
| 46 | 21H41A4566 | 11 | 10 | 13 | 13 | 6 | 8 | 9 | 9 | 10 | 10 |
| 47 | 22H45A4501 | 14 | 9 | 13 | 14 | 13 | 11 | 9 | 10 | 14 | 10 |
| 48 | 22H45A4502 | 12 | 9 | 9 | 10 | 8 | 11 | 9 | 6 | 8 | 10 |
| 49 | 22H45A4503 | 11 | 10 | 11 | 12 | 13 | 8 | 8 | 7 | 10 | 10 |
| 50 | 22H45A4504 | A | 11 | 8 | 9 | 8 | 7 | 6 | 9 | 8 | 12 |
| 51 | 22H45A4505 | 13 | 15 | 13 | 14 | 10 | 12 | 11 | 12 | 14 | 14 |
| 52 | 22H45A4506 | 2 | 6 | 9 | 9 | 9 | 2 | 5 | 6 | 10 | A 13 |

Signature of the Faculty:

Dept. Marks Incharge

HOD

Exams Incharge

Principal

BVC INSTITUTE OF TECHNOLOGY & SCIENCE AMALAPURAM

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 201

BVC INSTITUTE OF TECHNOLOGY & SCIENCE, AMALAPURAM
MAIN ANSWER SCRIPT

Name: A. Shiny Regd.: 21/11506 Date: 27/3/24 No. of Addl.:
Subject: BigData Analysis Class/Course: IV CSD Invigilator Sign:

1) BDA:

→ BDA stands for "BigData Analysis", where it refers to the processing the high volume of data or diverse of dataset to Analyze them.

→ these diverse of datasets are Analyzed with large technical Algorithms and tools

→ The BigData Analysis required large databases where the databases required to process them must be in low latency, whereas the traditional Databases doesn't have.

→ the BigData Analysis can be classified in the types such as Descriptive Analysis, Predictive Analysis, Prescriptive Analysis.

→ the BigData Analysis is reffered to the cost Extensive and more Effective process.

→ BigData can be of the following types

1) Structured
2) Semi Structured
3) Unstructured.

→ In BigData Analysis, the BigData can be taken from different sources and of the different sizes

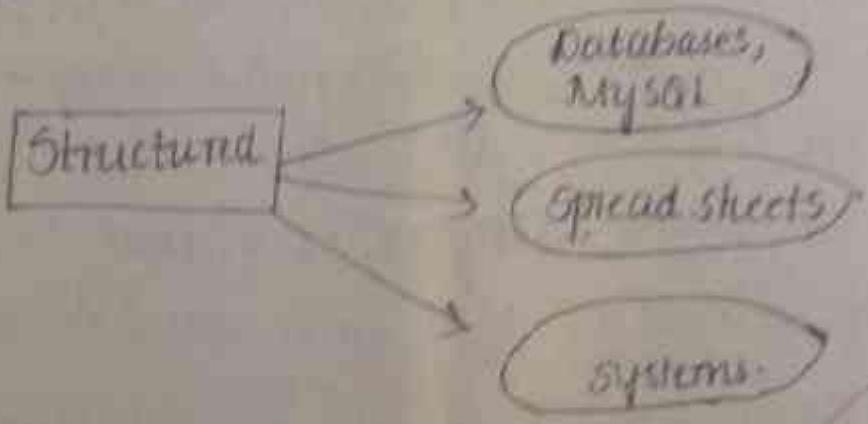
1) Structured Data

→ the Structured Data refers to the well organ-ized and well defined Data.

→ the Structured Data can be very easily understandable to human and also to computer processing.

→ the Structured Data may not require high-larg methodes to process. low latency methods are enough to understand them.

→ the Examples of Structured Data are. Spreadsheets. Database MySQL, Systems.




2) Semi Structured Data

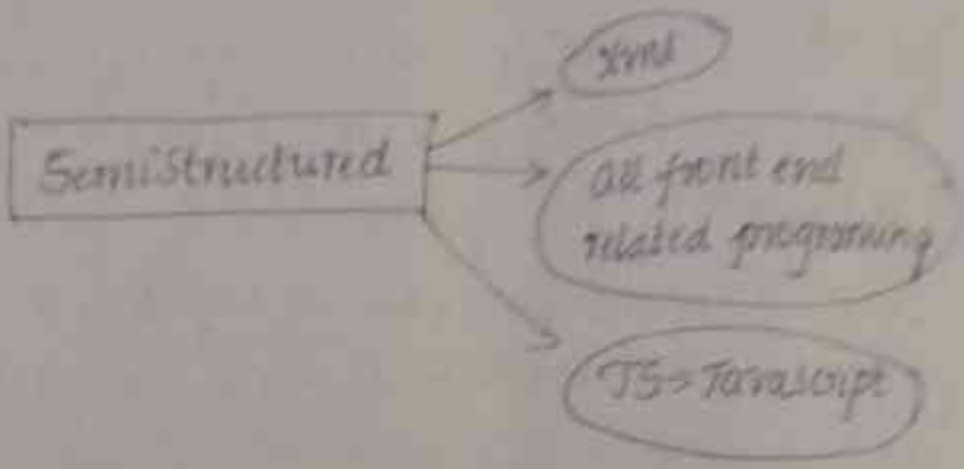
→ the Semi Structured Data refers to the combination of Structured and Unstructured

→ the Semi Structed Data is not well defined but it is in Structured form.

→ Semi Structured Data may be easily under-standable for computers but for human it is bit tough to understand.

→ Semi Structured Data can refers to the Example of Relational Database Management System. when the data is structured but not well defined.

→ Examples of Semi Structured Data are



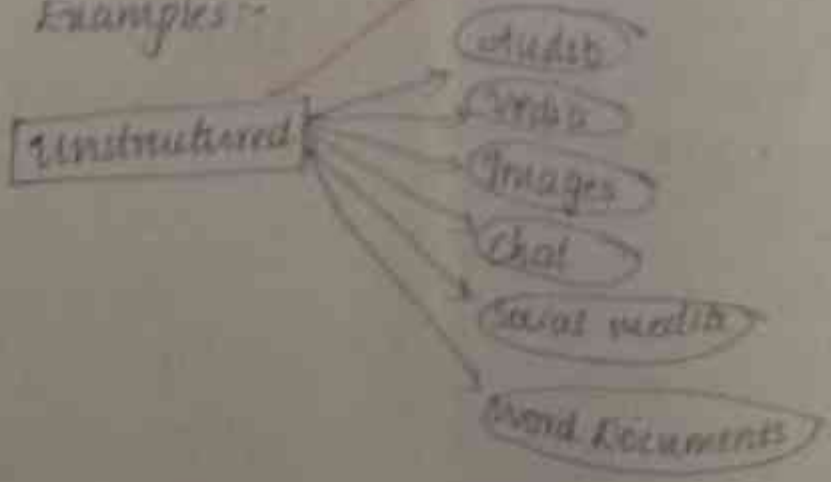

3) Unstructured Data :-

→ Unstructed Data refers to unorganised and not well defined Data.

→ This type of Data is very hard to understand by the Computers and Humans

→ Unstructed Data refers to more complex Data and less Efficiency but now a day more Organisations make use of unstructed Data

→ Examples :-



3) HDFS:-

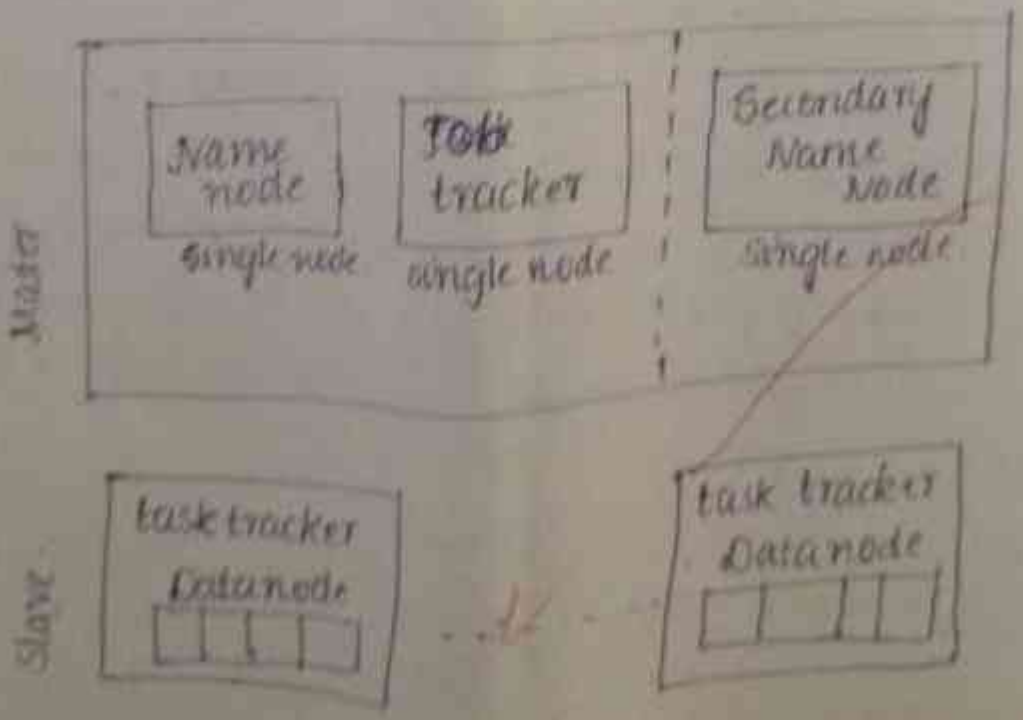
→ HDFS stands for "Hadoop Distributed File System", where, hadoop refers to the frame works, that can be implemented by "Java".

→ Hadoop was introduced by "cutting & Cafferilla"

→ Hadoop combines the Distributed file system, which is the place where large volume of data can be stored, refers to the "Hadoop Distributed file System".

→ In HDFS architecture, the hadoop was found by the google through GFS, so. based upon this hadoop was implement.

→ In HDFS architecture, it consists of Master and slave nodes.




→ the Architecture contains single Master node and one or more Slave nodes.

→ the Master node contains the 1) Name Node
2) Job tracker
3) Secondary Name Node.

1) Name Node:-
→ the name node is used to perform the Execution of operations of file System such as reading, writing, deleting and retriving.
→ the Name node is attached with Job node
→ The job of name node is to set the key value to identify the Data.

2) Job tracker:
→ the Job tracker make processing of the operations of Name node.
→ the Job tracker takes tasks from the Name node.
→ the Name Node containing refers to Meta Data which is data about Data.

3) Secondary Name Node
→ which is used to controle the Name Node tasks & Operations
→ which donot have access of write Operation.

→ the slave node contains 1) Data Node
2) Task tracker.

1) Data Node:-

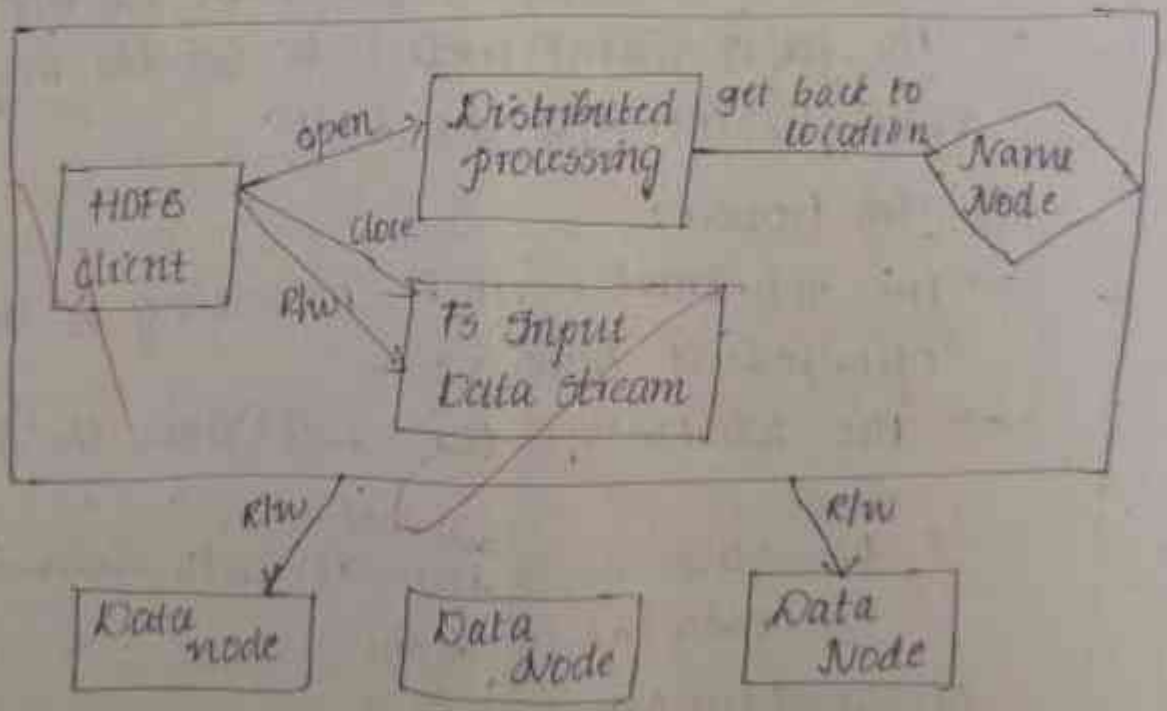
→ which is used to store the data of operations done on hadoop cluster

2) Task tracker:-

→ which is on the basis of job tracker, which sets the path of tasks that have to be performed by the job tracker.

→ then after applies to link to files.

Read & write node of HDFS:




Write Operation

→ the Hadoop file system will make use of job tracker and perform operation based upon it and after it sends to store to link to files.

Read Operation:

→ the read operation, have only access to read the files. It does not make use of job tracker

→ But, it make use of task tracker to read the data from Data nodes.

2) Data Stream:

→ Streaming of Data refers to the Data of larg volume and "diverse of Data sets", while processing these type of Dataset, it requir the methods of large Algorithms and "low-latency" processes.

Example → Data of Ecommerce website, facebook,

Flajolet Martin Algorithm:

→ the Flajolet Martin Algorithm refers to find the distint number of elements in the given Universal-set by using "hash functions" to set. bit-string of Data.

→ Initially, we before finding to no. of distint elements, we find the upper boundary of distint elements.

→ the upper boundary of distint elements must be in less size. Should not exceeds the maximum of universal

→ We need an array of string initially assigned to zero.

→ Now, by using flash functions we need to find the input and Now that input is set to the number link to bit string.

→ the number is set with $K^{th}$ bit of the given set.

→ finally, we count the trailing zeros and find the distinct no of elements.

Steps:-

1) Initially, the array of distinct elements stream Dataset 'S' and max is assigned to '0'.

2) Now, we will find the flash function to each element.

3) Now, convert the hashed function elements to binary values.

4) Nows count the no of trailing 'zeros' and assign to 'n'.

```
if (n > max)
    max = n;
```

5) Now, find the distinct element by using the formula ($2^n$).

Example:

let use consider the stream Data

1, 3, 2, 1, 4, 3, 4, 3, 1, 2, 3, 1.

hash function $h(x) = (6x+1) \bmod 5$.

Now perform hash operations on each element.

$h(0) = (6(0)+1) \bmod 5$
$= 2$ ⟶ binary value = 010 → trailing zeros = 1

$h(3) = (6(3)+1) \bmod 5$
$= 4$ ⟶ 100 = 2

$h(2) = (6(2)+1) \bmod 5$
$= 3$ ⟶ 011 = 0

$h(2) = (6(1)+1) \bmod 5$
$= 2$ ⟶ 010 = 1

$h(2) = (6(2)+1) \bmod 5$
$= 3$ ⟶ 011 = 0

$h(3) = (6(3)+1) \bmod 5$
$= 4$ ⟶ 100 = 2

$h(4) = (6(4)+1) \bmod 5$
$= 0$ ⟶ 000 = 0

$h(3) = (6(3)+1) \bmod 5$
$= 4$ ⟶ 100 = 2

$h(1) = (6(1)+1) \bmod 5$
$= 2$ ⟶ 010 = 1

$h(2) = (6(2)+1) \bmod 5$
$= 3$ ⟶ 011 = 0

$h(3) = (6(3)+1) \bmod 5$
$= 4$ ⟶ 100 = 2

$h(1) = (6(1)+1) \bmod 5$
$= 2$ ⟶ 010 = 1

Therefore, the max trailing zeros is 2

$n = 2$, where max = 0.

$\therefore n > max$
then (max = 2)

Now, to find distinct no of elements we use $2^n$

$\Rightarrow 2^{(2)}$

$\Rightarrow 4$.

Hence, we have '4' distinct no of elements in the given Data Stream.

# BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

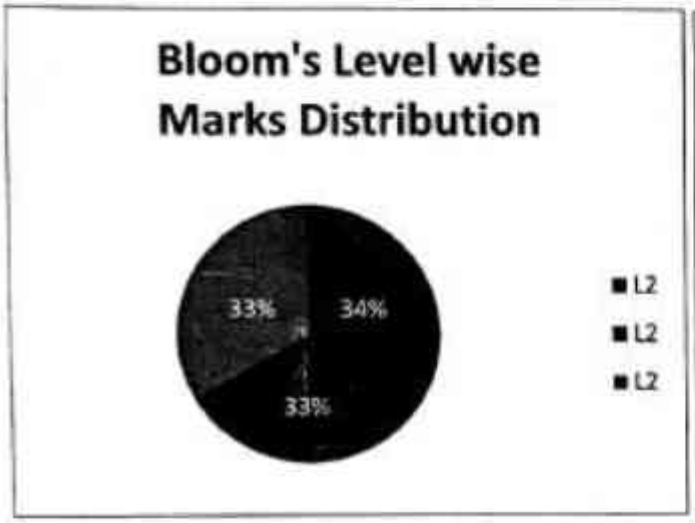
## DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

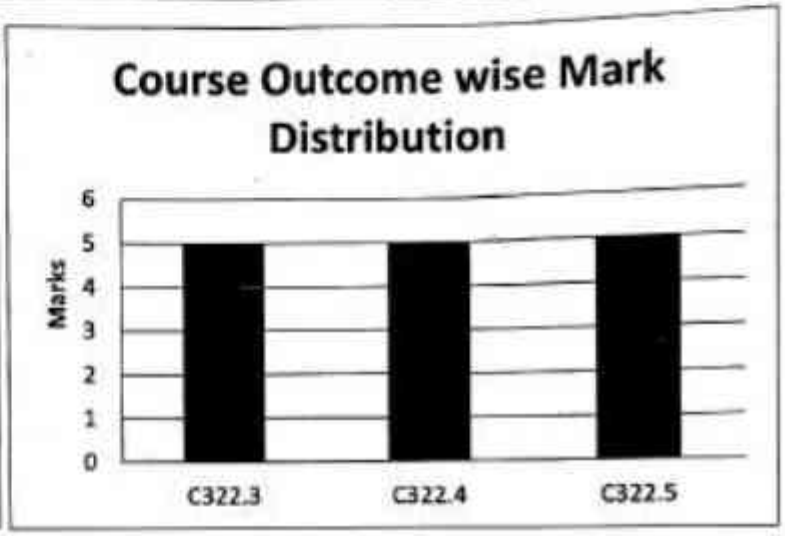
A.Y: 2023-24

Course: DL MID-2 Max Marks: 15

Branch: AI&ML Year: III Semester: II Duration: 1.5Hr

| Q.No | Questions | Makrs | CO | BL |
|---|---|---|---|---|
| 1 | Explain the relationship between the network, layers, loss function, and optimize | 5 | C322.3 | L2 |
| 2 | Illustrate the process of building a deep neural network in PyTorch | 5 | C322.4 | L2 |
| 3 | Discuss about Restricted Boltzmann Machines. | 5 | C322.5 | L2 |




BL – Bloom's Taxonomy Levels (L1- Remembering, L2- Understanding, L3 – Applying, L4 – Analysing, L5 – Evaluating, L6 - Creating)

CO – Course Outcomes

**Bonam Venkata Chalamayya Institute of Technology & Science**
**DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING**
**Scheme of Evaluation With CO and BT Mapping**

Course: DL (C322) Class: III B.Tech II Sem

AY: 2023-24

**SCHEME OF EVALUATION WITH CO AND BT MAPPING**

| SNO | QUESTION | CO | BT |
|---|---|---|---|
| 1. | Explain the relationship between the network, layers, loss function, and optimizer | C322.3 | Understanding |
| 2 | Illustrate the process of building a deep neural network in PyTorch | C322.4 | Understanding |
| 3 | Discuss about Restricted Boltzmann Machines. | C322.5 | Evaluating |

1. Explain the relationship between the network, layers, loss function, and optimizer

    1. Diagram -----2m
    2. Explanation----3m

2. Illustrate the process of building a deep neural network in PyTorch
    1. list of 5steps ---1m
    2. Explanation----4m
3. Discuss about Restricted Boltzmann Machines
    1. Definition ---2m
    2. Explanation----3m

Faculty

14 marks 13

3. Ans Restricted Boltzmann Machines: 4+5+5=14

Boltzmann Machines:

→ Usually all the models in deepLearning or in Machine Learning are the Supervised Models & Unsupervised Models.

Supervised Models are:

Artificial Neural Networks (ANN)

Convolutional Neural Networks (CNN)

Recurrent Neural Networks (RNN)

Unsupervised Models are:

Boltzmann Machines.

Auto encoders

→ Boltzmann Machines are again classified into two types

1. Restricted Boltzmann Machines (RBM)
2. Deep Belief Network (DBN).

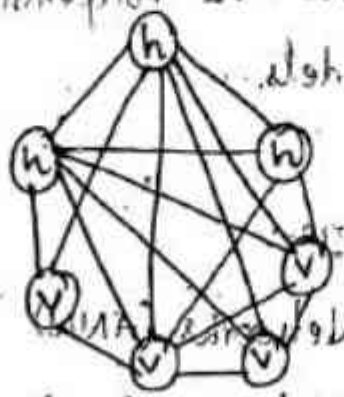
1. Restricted Boltzmann Machines (RBM):

Restricted Boltzmann Machines is a Unsupervised

Models.

→ Restricted Boltzmann Machines, every node it connected each other every node.

→ In Restricted Boltzmann Machines are hidden nodes and visible node




→ The above diagram represents Restricted Boltzmann Machines.

here h represents hidden nodes

v represents visible nodes

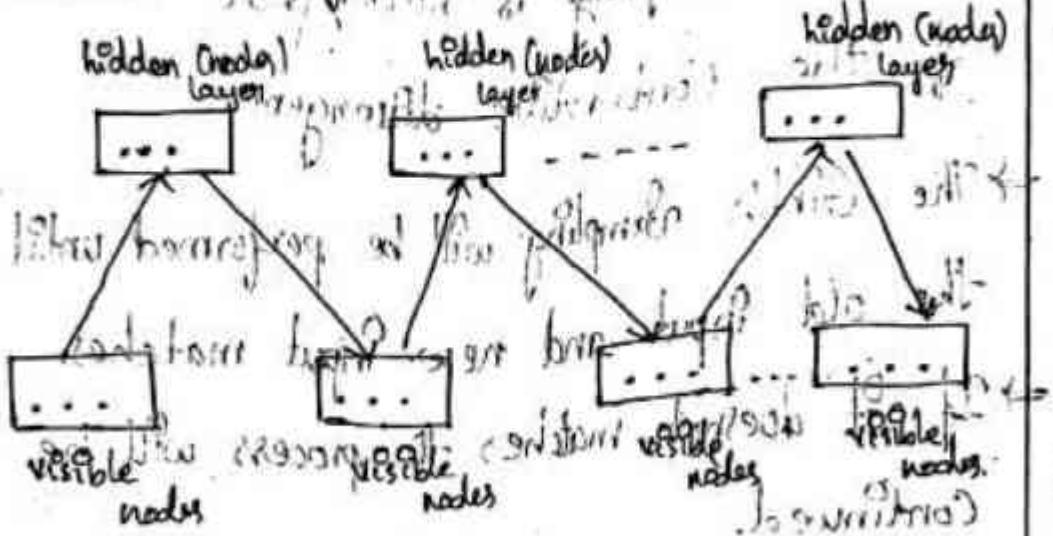
→ hidden nodes are bidirection (It is not a directed).

→ hidden nodes are connected to visible nodes

→ Visible nodes are connected to hidden nodes.

## RBM Training:

1. Contrastive divergence
2. Gibbs Sampling




→ Here Hidden nodes are not connected hidden nodes and visible nodes are not connected to visible nodes (They connect eachother).

## ① Contrastive Divergence:

→ In Contrastive Divergence the weights are measure.

→ Here, the input layer will be updated.

→ Here, the hidden layer forms with the help of visible layers.

→ The first input layer is not matches with

with the updated Input.

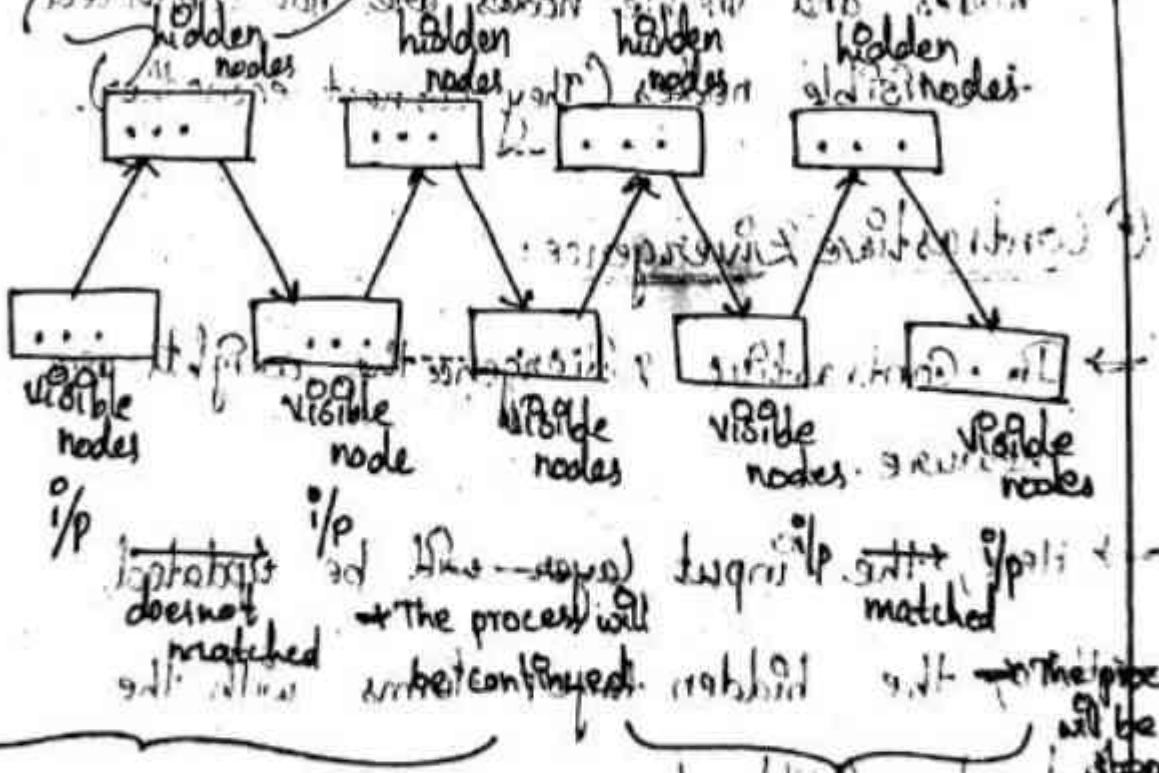
② Gibb's Sampling:

→ Gibbs Sampling is nothing but Continuation of the Contrastive divergence.

→ The Gibbs Sampling will be performed until the old input and new input matches.

→ If it doesn't matches the process will be Continued.

→ If it matches the process will be stopped.




Contrastive divergence

Gibbs Sampling

A

Name : K Ammani
Regd. No. : 21H41A6130
Class / Course :
Subject :
Date :
Invigilator Sign :

2 Ans Building a deep neural network in PyTorch:

→ Deep Neural Network is a deep Learning Technique.

→ It is used to Solve complex problems.

→ PyTorch is a Deep Learning Framework.

→ PyTorch Framework is mainly used for Solving problems and It is speed

→ There are five steps to build a deep neural network in pytorch.

① Import necessary modules

② Design a network Architecture

③ Initialize parameters

④ Create the Dataloader.

⑤ Train the Network

① Import necessary Modules:

→ It is first step for building the deep neural network using PyTorch

→ Import necessary Modules is nothing but importing the modules which are used for the building of deep neural network.

② Design a Network Architecture:

→ It is the second step for building the deep neural networks using PyTorch

→ To design a Network Architecture we uses layer like activation layer (like relu), network layer, Pooling

③ Initialize Parameters:

→ It is the third step for building the deep neural network using pytorch

→ Here, we initialize the parameters that we need for the further steps

A

Name : B Ammani
Regd. No. : 21H41A6180
Class / Course :
Subject :
Date :
Invigilator Sign. :

④ Create the Dataloader:

→ It is the fourth step to build the deep neural network using pytorch

→ Here we load the dataset and that dataset → dataloader

→ After loading the dataset we train the network.

⑤ Train the Network:

→ It is the fifth step to build a deep neural network using pytorch.

→ Here, we train the network as we want (as requirements).

→ After that we perform testing to that

→ And then we perform validation.

Input
Convolutional
Max pooling
Convolutional
Max pooling
Full Connected
Full Connected
Soft Max

Name: K Ammani Class / Course: Date:
Regd. No.: 21H41A6180 Subject: Invigilator Sign:

Ans: Relationship between Network, Layers, loss function and optimizers

Network:

→ Network is used for deep learning Algorithms as well as Machine learning Algorithms.

Layers:

→ The are so many network layers like CNN (Convolutional Neural Network), ANN (Artifical Neural Network), RNN (Recurrent Neural Network).

Layers:

→ Layers are used for processing the data (Input layer).

→ There are somany layers → activation layers (like relu), Network layers ---

## Loss function:

→ If the accuracy is low the loss function is high

→ loss function is difference b/w the actual value and the predicted value

→ If the predicted value and actual value is not same then the loss function will be high.

→ If the actual value and predicted value is then the loss function is low.

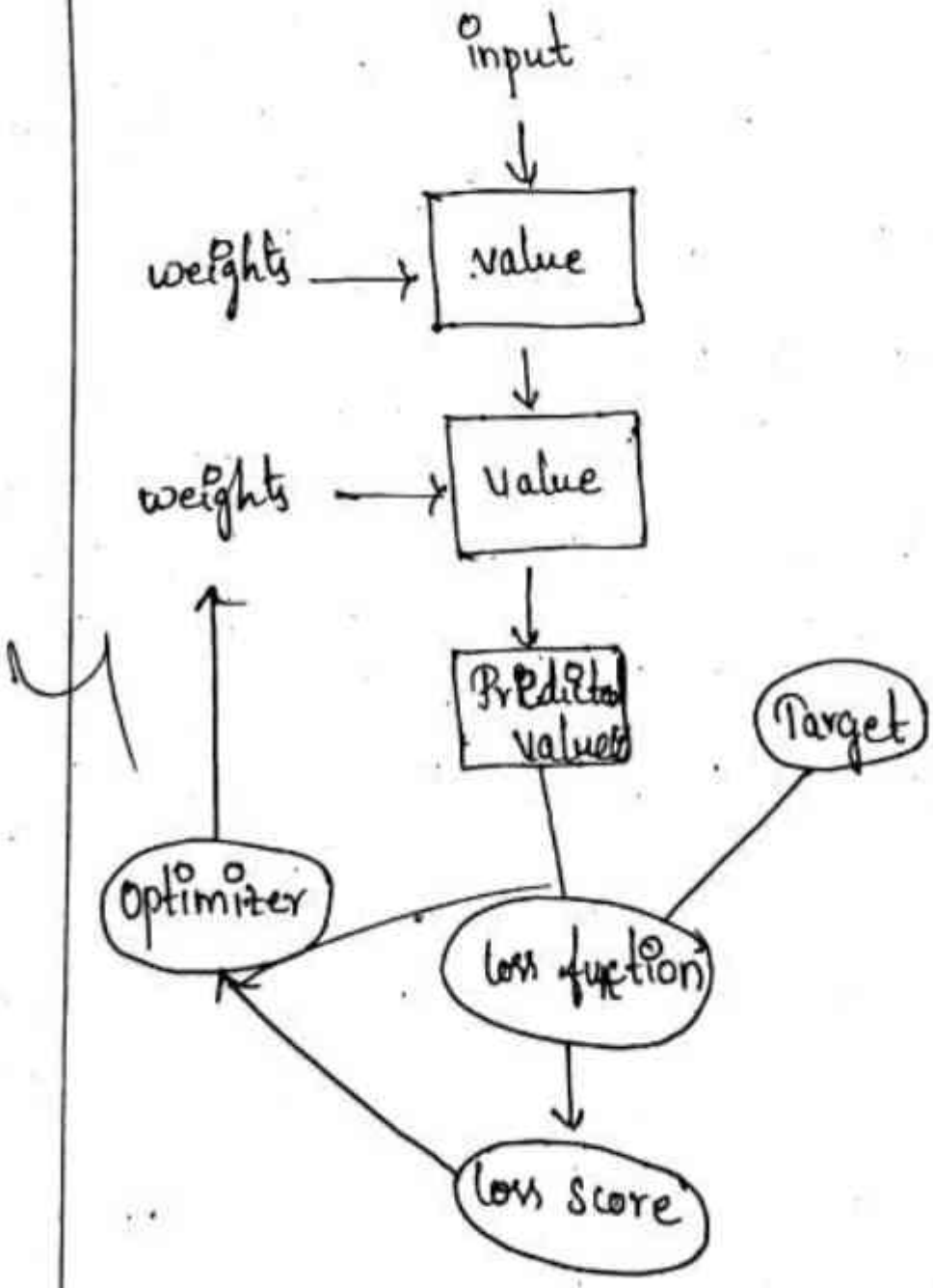
## Optimizer:

→ Optimizer is used for optimizes.

→ optimizer gives weights and as shown in the below diagram

Name: K.Ammani Class / Course: Date:
Regd. No.: Subject: Invigilator Sign.:

# Relationship loss function and optimizer:



| S No | Regd. No | BE R203204P | | IOT R203242C | | CN R2032421 | | DL R2032422 | | DAA R2032423 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 1 | 21H41A6101 | 12 | 7 | 13 | 9 | 10 | 8 | 12 | 10 | 10 | 9 |
| 2 | 21H41A6102 | 14 | 10 | 15 | 11 | 12 | 13 | 12 | 10 | 13 | 14 |
| 3 | 21H41A6103 | 11 | 7 | 13 | 7 | 9 | 8 | 10 | 9 | 7 | 12 |
| 4 | 21H41A6104 | 15 | 12 | 15 | 14 | 13 | 12 | 11 | 13 | 13 | 15 |
| 5 | 21H41A6105 | 14 | 12 | 15 | 14 | 9 | 12 | 13 | 13 | 11 | 15 |
| 6 | 21H41A6106 | 14 | 14 | 15 | 15 | 14 | 13 | 15 | 14 | 14 | 15 |
| 7 | 21H41A6107 | 13 | 10 | 11 | 10 | 8 | 8 | 9 | 9 | 11 | 10 |
| 8 | 21H41A6108 | 14 | 12 | 15 | 15 | 14 | 12 | 15 | 14 | 14 | 14 |
| 9 | 21H41A6109 | 12 | 12 | 14 | 15 | 14 | 12 | 12 | 14 | 13 | 15 |
| 10 | 21H41A6110 | 11 | 7 | 5 | 9 | 11 | 7 | 9 | 12 | 4 | 12 |
| 11 | 21H41A6111 | 10 | 9 | 10 | 10 | 8 | 11 | 9 | 12 | 2 | 12 |
| 12 | 21H41A6112 | 12 | 10 | 7 | 10 | 8 | 9 | 10 | 12 | 12 | 13 |
| 13 | 21H41A6113 | 10 | 12 | 14 | 14 | 14 | 14 | 13 | 13 | 8 | 14 |
| 14 | 21H41A6114 | 8 | 10 | 14 | 14 | 9 | 13 | 11 | 9 | 10 | 14 |
| 15 | 21H41A6115 | 11 | 9 | 12 | 13 | 10 | 11 | 10 | 13 | 12 | 8 |
| 16 | 21H41A6116 | 6 | A | 9 | 10 | 8 | 6 | 12 | 9 | 5 | Ab |
| 17 | 21H41A6117 | 14 | 11 | 14 | 12 | 14 | 12 | 13 | 13 | 13 | 10 |
| 18 | 21H41A6118 | 5 | 10 | 5 | 10 | 8 | 12 | 10 | 9 | 9 | 14 |
| 19 | 21H41A6119 | 11 | 15 | 15 | 14 | 14 | 15 | 15 | 14 | 14 | 14 |
| 20 | 21H41A6120 | 11 | 12 | 15 | 13 | 11 | 13 | 11 | 12 | 12 | 13 |
| 21 | 21H41A6121 | 11 | 9 | 12 | 4 | 9 | 5 | 8 | 12 | 4 | 13 |
| 22 | 21H41A6122 | 11 | 8 | 14 | 11 | 10 | 14 | 13 | 9 | 7 | 14 |
| 23 | 21H41A6123 | 8 | 10 | 15 | 11 | 9 | 13 | 9 | 12 | 10 | 15 |
| 24 | 21H41A6124 | 13 | 15 | 15 | 14 | 11 | 13 | 10 | 14 | 11 | 15 |
| 25 | 21H41A6125 | 14 | 15 | 15 | 15 | 14 | 15 | 15 | 15 | 13 | 15 |
| 26 | 21H41A6126 | 14 | 15 | 15 | 15 | 13 | 14 | 11 | 12 | 13 | 15 |
| 27 | 21H41A6127 | 3 | 14 | A | 9 | 8 | 10 | 9 | 9 | 6 | 7 |
| 28 | 21H41A6128 | 9 | 12 | 14 | A | 9 | 14 | 12 | 14 | 13 | 9 |

| S No | Regd. No | BE R203204P | | IOT R203242C | | CN R2032421 | | DL R2032422 | | DAA R2032423 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 30 | 21H41A6130 | 11 | 12 | 15 | 14 | 13 | 14 | 11 | 14 | 12 | 10 |
| 31 | 21H41A6131 | 11 | 14 | 15 | 13 | 13 | 12 | 12 | 14 | 12 | 14 |
| 32 | 21H41A6132 | 12 | 12 | 14 | 15 | 9 | 14 | 11 | 13 | 10 | 14 |
| 33 | 21H41A6133 | 15 | 11 | 13 | 10 | 7 | 12 | 13 | 10 | 11 | 11 |
| 34 | 21H41A6134 | 12 | 11 | 15 | 11 | 13 | 13 | 11 | 13 | 12 | 12 |
| 35 | 21H41A6136 | 10 | 15 | 14 | 10 | 9 | 14 | 13 | 9 | 13 | 12 |
| 36 | 21H41A6137 | 13 | 12 | 15 | 15 | 12 | 12 | 15 | 13 | 12 | 15 |
| 37 | 21H41A6138 | 9 | 10 | 6 | 12 | 11 | 8 | 10 | 12 | 10 | 12 |
| 38 | 21H41A6139 | 9 | 15 | 10 | 12 | 13 | 13 | 12 | 12 | 12 | 13 |
| 39 | 21H41A6140 | 13 | 14 | 15 | 15 | 15 | 14 | 15 | 13 | 14 | 15 |
| 40 | 21H41A6141 | 15 | 10 | 10 | 10 | 8 | 13 | 13 | 11 | 14 | 8 |
| 41 | 21H41A6142 | 13 | 12 | 15 | 14 | 14 | 15 | 15 | 14 | 14 | 14 |
| 42 | 21H41A6143 | 11 | 14 | 15 | 12 | 10 | 12 | 8 | 13 | 6 | 11 |
| 43 | 21H41A6144 | 15 | 11 | 15 | 14 | 11 | 14 | 14 | 14 | 14 | 13 |
| 44 | 21H41A6145 | 6 | 10 | 4 | A | 6 | 12 | 9 | 9 | 6 | 12 |
| 45 | 21H41A6146 | 9 | 14 | 10 | 12 | 12 | 12 | 14 | 14 | 8 | 13 |
| 46 | 21H41A6147 | 14 | 13 | 15 | 14 | 12 | 14 | 15 | 15 | 13 | 15 |
| 47 | 21H41A6148 | 14 | 13 | 15 | 15 | 14 | 15 | 15 | 15 | 13 | 15 |
| 48 | 21H41A6149 | 13 | 13 | 15 | 15 | 12 | 14 | 15 | 15 | 13 | 15 |
| 49 | 21H41A6150 | 10 | 9 | 9 | 11 | 8 | 11 | 12 | 11 | 11 | 10 |
| 50 | 21H41A6151 | 9 | 8 | 8 | 11 | 9 | 9 | 9 | 9 | 7 | 2 |
| 51 | 21H41A6152 | 13 | 10 | 15 | 14 | 13 | 14 | 13 | 14 | 11 | 12 |
| 52 | 21H41A6153 | 4 | 9 | 3 | 7 | 9 | 7 | 9 | 9 | 6 | 6 |
| 53 | 21H41A6154 | 10 | 12 | 15 | 12 | 9 | 12 | 9 | 14 | 12 | 10 |
| 54 | 21H41A6155 | 8 | 10 | 11 | 12 | 8 | 7 | 12 | 10 | 7 | 5 |
| 55 | 21H41A6156 | 11 | 11 | 10 | 13 | 11 | 12 | 15 | 9 | 14 | 12 |
| 56 | 21H41A6157 | 8 | 11 | 8 | 10 | 9 | 10 | 10 | 12 | 11 | 10 |
| 57 | 21H41A6158 | 12 | 9 | 15 | 12 | 11 | 14 | 15 | 13 | 12 | 12 |
| 58 | 21H41A6159 | A | 10 | 9 | 9 | 8 | 3 | 9 | 10 | 9 | 8 |

| S No | Regd. No | BE R203204P | | IOT R203242C | | CN R2032421 | | DL R2032422 | | DAA R2032423 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 | 1mid mm 15 | 2mid mm 15 |
| 59 | 21H41A6160 | 7 | 8 | 10 | 7 | 8 | 9 | 9 | 9 | 11 | 1 |
| 60 | 21H41A6161 | 14 | 12 | 13 | 11 | 12 | 14 | 15 | 14 | 11 | 5 |
| 61 | 21H41A6162 | 12 | 14 | 14 | 12 | 14 | 14 | 9 | 15 | 13 | 12 |
| 62 | 21H41A6163 | 9 | 15 | 10 | 13 | 11 | 14 | 12 | 14 | 13 | 13 |
| 63 | 21H41A6164 | 9 | 13 | 10 | 10 | 12 | 10 | 10 | 9 | 12 | 11 |
| 64 | 21H41A6165 | 14 | 14 | 13 | 11 | 13 | 14 | 13 | 13 | 13 | 15 |
| 65 | 21H41A6166 | 13 | 14 | 13 | 15 | 13 | 15 | 12 | 14 | 11 | 10 |
| 66 | 22H45A6101 | 12 | 13 | 15 | 14 | 9 | 14 | 10 | 13 | 12 | 12 |
| 67 | 22H45A6102 | 7 | 11 | 11 | 12 | 9 | 11 | 9 | 12 | 9 | 3 |
| 68 | 22H45A6103 | 13 | 15 | 15 | 14 | 14 | 14 | 15 | 15 | 13 | 15 |
| 69 | 22H45A6104 | 4 | 4 | 7 | 9 | 7 | 8 | 9 | 9 | 10 | 8 |
| 70 | 22H45A6105 | 12 | 10 | 15 | 10 | 9 | 13 | 13 | 12 | 11 | 8 |
| 71 | 22H45A6106 | 13 | 15 | 15 | 11 | 11 | 12 | 11 | 14 | 14 | 12 |

Signature of the Faculty:

Dept. Exams Incharge HOD Exams Incharge Principal

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM

BVC INSTITUTE OF TECHNOLOGY & SCIENCE AMALAPURAM

B V C INSTITUTE OF TECHNOLOGY & SCIENCE:: BATLAPALEM

MID EXAM - I | II-MBA (IV SEM) | SUB: **I E**

TIME: 10.00A.M to 11.30 A.M | DATE: 27-02-2024 | MAX MARKS: **15**

ANSWER ALL THE QUESTIONS. 3X5=15M

1 Explain about Entrepreneurial motivation and barriers? **( C222.1- Understanding )**

**2.** What is meant by feasibility study ? Explain its types and techniques?**(C222.2 - Remembering)**

3. Outline institutional support for new ventures?(C222.3- Understanding)

INSTITUTE OF TECHNOLOGY & SCIENCE * BVC * AMALAPURAM

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

**Bonam Venkata Chalamayya Institute of Technology & Science**
**Department of Management studies(MBA)**

Course: INNOVATION AND ENTREPRENEURSHIP
AY: 2023-24 ; 4th semester

Class: II MBA
Faculty name: V.Padmasri

Course code:C222

**SCHEME OF EVALUATION WITH CO AND BT MAPPING**

| QNO | QUESTION | MARKS | CO | BT LEVEL |
|---|---|---|---|---|
| 1 | Explain about Entrepreneurial motivation and barriers? | 5 | C222.1 | TL 2 |
| 2 | What is meant by feasibility study ? Explain its types and techniques? | 5 | C222.2 | TL 1 |
| 3 | Outline institutional support for new ventures? | 5 | C222.3 | TL 2 |

1. Explain about Entrepreneurial motivation and barriers?

   Entrepreneurial motivation -2m

   Entrepreneurial motivation and barriers-3m

2. What is meant by feasibility study ? Explain its types and techniques?

   Feasibility study -1m

   Types 2m

   Techniques 2m

3.Outline institutional support for new ventures?

   New venture meaning -1 m

   Institutional support for new ventures 4M

Faculty signature

INSTITUTE OF TECHNOLOGY & SCIENCE * BVC * AMALAPURAM

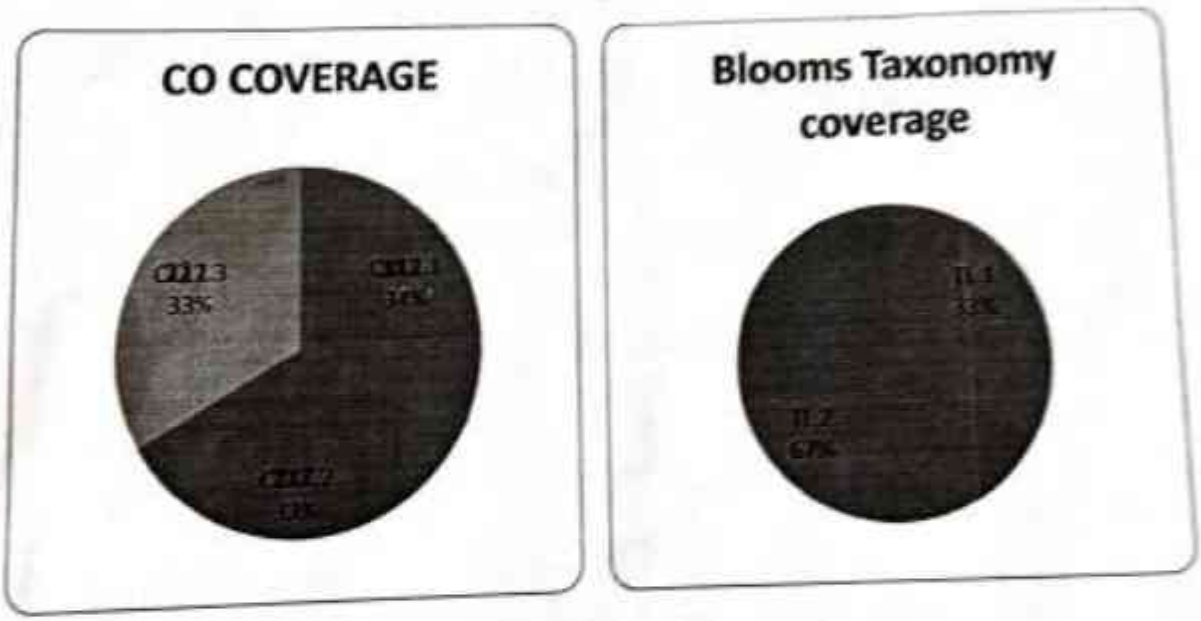
PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 201

**Bonam Venkata Chalamayya Institute of Technology & Science**
**Department of Management studies(MBA)**

Course: INNOVATION AND ENTREPRENEURSHIP (C222) Class: II MBA
AY: 2023-24 ; 4th semester

INTERNAL EXAMINATION - I

| QNO | QUESTION | MARKS | CO | BT LEVEL |
|---|---|---|---|---|
| 1 | Explain about Entrepreneurial motivation and barriers? | 5 | C222.1 | TL2 |
| 2 | What is meant by feasibility study ? Explain its types and techniques? | 5 | C222.2 | TL3 |
| 3 | Outline institutional support for new ventures? | 5 | C222.3 | TL2 |




BL – Bloom's Taxonomy Levels (TL1- Remembering, TL2- Understanding, TL3 – Applying, TL4 – Analysing, TL5 – Evaluating, TL6 -Creating)

Faculty signature

BVC INSTITUTE OF TECHNOLOGY & SCIENCE * AMALAPURAM

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 201

1. Entrepreneur :-

Entrepreneur means the person who start a business in a innovative way and creativity & new thinking that person called entrepreneur.

Entrepreneurship :-

Entrepreneurship means the process of enterpreneur doing business in innovative way and taking initiation & steach & succes of those goals.

Entrepreneurial Motivation :-

The person who inspired & taken intion by the giving of motivation & steaching to the behaviour of Entrepreneurial goal.

Entrepreneur is a business man a person who takes the business intiation in the innovative way that creation of skills called Entrepreneurship.

Barriers of Entrepreneurial Motivation

The Entrepreneurial Motivation must occur of different barriers so that divided into three types as follows.

→ need of lack of motivation and, lack of patience and, lack depending other activities.

(c) Social Barriers :-

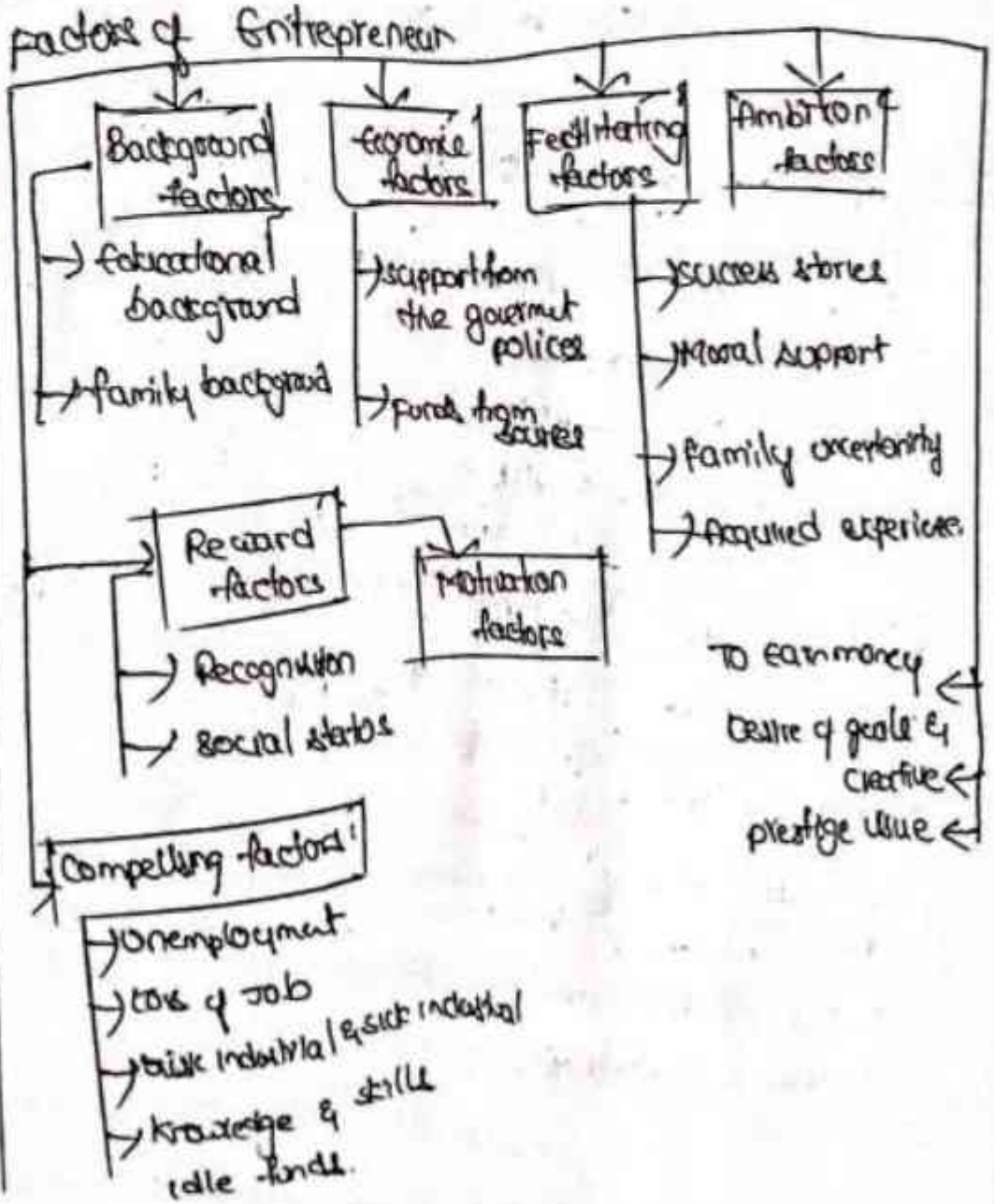
Entrepreneurial motivation point of may view of social barriers that are related act of entrepreurship

(a) pressure from community :-

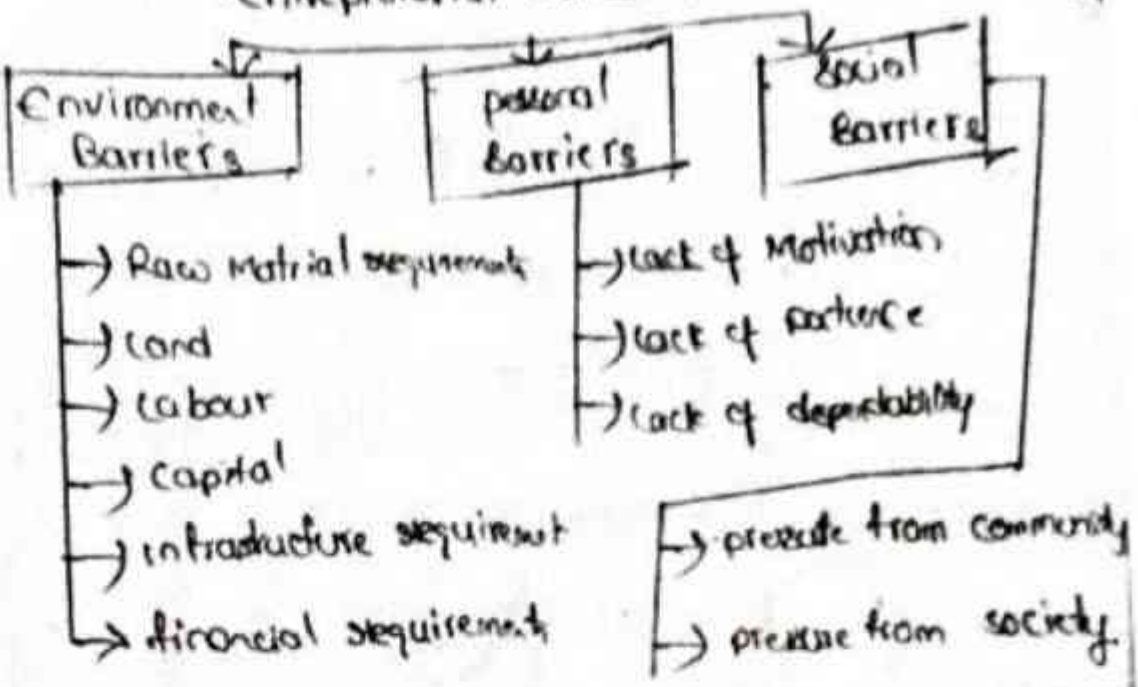
The barrier may come in the community of person they see there points that cause to problem to entrepreneur.

(b) pressure from society :-

The barrier may arise in the society point they feel that are not suppose to do business.



## Entrepreneurial Motivation Barriers




(1) Environmental Barriers :-

Environmental barriers nothing but the Environmental problems which comes from out of business as labour

(a) Raw Material

- In entrepreneurship availability raw material some of barrier.

(b) Land, Labour, Capital :-

Land, Labour, Capital most wanted things to business. Most required for own business.

(c) Infrastural requirements :-

Infrastural means the structure for production.

(d) Financial requirements :-

Most important thing of force related

(2) personal Barriers :-

While starting of business the personal problems may arise that as follows

B V C INSTITUTE OF TECHNOLOGY AND SCIENCE :: AMALAPURAM

M B A IV SEM FINANCE I MID & MINI PROJECT MARKS (22 BATCH)

THEORY & MINI PROJECT

| S No | Regd No | SCMA MB1941 | | IAE MB1942 | | FD MB194B1 | | GFM MB194B2 | | FRM MB194B3 | | SFM MB194B4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MID I | M P I | MID I | M P I | MID I | M P I | MID I | M P I | MID I | M P I | MID I | M P I |
| | | M M: 15 | M M: 10 | M M: 15 | M M: 10 | M M: 15 | M M: 10 | M M: 15 | M M: 10 | M M: 15 | M M: 10 | M M: 15 | M M: 10 |
| 1 | 22H41E0001 | 14 | 10 | 14 | 10 | 12 | 10 | 14 | 10 | 12 | 10 | 14 | 9 |
| 2 | 22H41E0003 | 8 | 10 | 7 | 9 | 10 | 8 | 12 | 9 | 9 | 8 | 11 | 7 |
| 3 | 22H41E0004 | 13 | 10 | 14 | 10 | 9 | 8 | 13 | 10 | 9 | 8 | 14 | 9 |
| 4 | 22H41E0005 | 14 | 10 | 13 | 9 | 12 | 10 | 14 | 10 | 12 | 10 | 13 | 10 |
| 5 | 22H41E0006 | 14 | 10 | 12 | 8 | 12 | 8 | 14 | 10 | 13 | 8 | 12 | 9 |
| 6 | 22H41E0007 | 13 | 10 | 14 | 10 | 13 | 10 | 14 | 10 | 13 | 10 | 14 | 10 |
| 7 | 22H41E0008 | 8 | 10 | 12 | 8 | 12 | 8 | 14 | 9 | 11 | 8 | 13 | 7 |
| 8 | 22H41E0010 | 14 | 10 | 14 | 9 | 14 | 10 | 14 | 10 | 13 | 10 | 15 | 9 |
| 9 | 22H41E0012 | 14 | 10 | 13 | 8 | 13 | 10 | 14 | 10 | 13 | 10 | 14 | 9 |
| 10 | 22H41E0015 | 13 | 10 | 12 | 8 | 12 | 10 | 14 | 10 | 12 | 10 | 14 | 9 |
| 11 | 22H41E0017 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| 12 | 22H41E0018 | 14 | 10 | 12 | 9 | 13 | 10 | 15 | 10 | 14 | 10 | 13 | 10 |
| 13 | 22H41E0019 | 12 | 10 | 12 | 8 | 13 | 10 | 14 | 10 | 13 | 10 | 14 | 9 |
| 14 | 22H41E0020 | 13 | 10 | 10 | 9 | 12 | 10 | 13 | 10 | 12 | 10 | 13 | 9 |
| 15 | 22H41E0021 | 14 | 10 | 12 | 8 | 12 | 10 | 14 | 10 | 12 | 10 | 14 | 9 |
| 16 | 22H41E0022 | 14 | 10 | 12 | 8 | 13 | 10 | 14 | 10 | 12 | 10 | 14 | 9 |
| 17 | 22H41E0029 | 14 | 10 | 12 | 9 | 13 | 10 | 15 | 10 | 12 | 10 | 14 | 9 |
| 18 | 22H41E0030 | 12 | 10 | 12 | 8 | 13 | 10 | 14 | 10 | 12 | 10 | 13 | 9 |

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 201

# BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
## AMALAPURAM -533221
## (AUTONOMOUS)

Mid Exam: II | A.Y. 2023-24 | Branch: MCA
Subject:HCI | Max. Marks: 40 | Times: 2Hr

**Answer all questions**

**4 x 10 = 40**

| Q.No. | Question | Marks | CO | BL |
|---|---|---|---|---|
| 1 | Explain about Key aspects of Screen Navigation and flow in Screen Designing? | 10 | CO3 | BL5 |
| 2 | a) Explain a detailed note on selection of devices based and Screen-Based controls.<br>b) What are the benefits of Icons and Indicators in Windows? | 10 | CO4 | BL5 |
| 3 | Discuss about HCI in the Software Specification Methods. | 10 | CO5 | BL2 |
| 4 | a) Explain about Types of Pointing Devices.<br>b) Summarize the Image and Video Displays. | 10 | CO6 | BL4 |

FACULTY SIGNATURE.

B. Sudha

BVC INSTITUTE OF TECHNOLOGY & SCIENCE AMALAPURAM

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

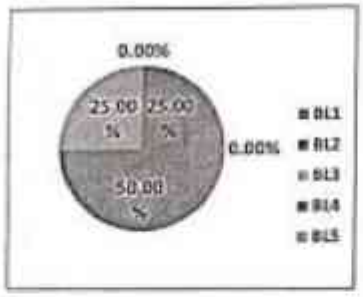
## BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE(AUTONOMOUS):: AMALAPURAM

### MID EXAMINATIONS QUESTION PAPER

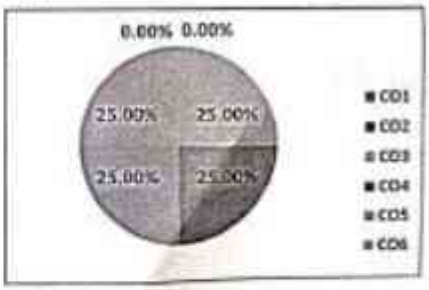
**Branch: MCA** **Class:: I YEAR II SEM**
**SUB: HCI**

| Q.No | Question | MARKS | CO | BL |
|---|---|---|---|---|
| 1 | Explain about Key aspects of Screen Navigation and flow in Screen Designing? | 10 | CO3 | BL4 |
| 2 | a) Explain a detailed note on selection of devices based and Screen-Based controls.<br>b) What are the benefits of Icons and Indicators in Windows? | 10 | CO4 | BL5 |
| 3 | Discuss about HCI in the Software Specification Methods. | 10 | CO5 | BL2 |
| 4 | a) Explain about Types of Pointing Devices.<br>b) Summarize the Image and Video Displays. | 10 | CO6 | BL4 |

BL-OK Accepted...




CO-OK Accepted...



| BL1 | BL2 | BL3 | BL4 | BL5 |
|---|---|---|---|---|
| 0 | 0 | 0 | 10 | 0 |
| 0 | 0 | 0 | 0 | 10 |
| 0 | 10 | 0 | 0 | 0 |
| 0 | 0 | 0 | 10 | 0 |
| 0 | 10 | 0 | 20 | 10 |
| 0.00% | 25.00% | 0.00% | 50.00% | 25.00% |

25.00%

| CO1 | CO2 | CO3 | CO4 | CO5 | CO6 |
|---|---|---|---|---|---|
| 0 | 0 | 10 | 0 | 0 | 0 |
| 0 | 0 | 0 | 10 | 0 | 0 |
| 0 | 0 | 0 | 0 | 10 | 0 |
| 0 | 0 | 0 | 0 | 0 | 10 |
| 0 | 0 | 10 | 10 | 10 | 10 |
| 0.00% | 0.00% | 25.00% | 25.00% | 25.00% | 25.00% |

100.00%

INSTITUTE OF TECHNOLOGY & SCIENCE
SRIKAKULAM

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 201

KONERU VENKATA [illegible] INSTITUTE OF [illegible] TECHNOLOGY & SCIENCE

## INTERNAL THEORY EXAMS MAIN ANSWER BOOK

Year 1st B.Tech/M.Tech/MCA/MBA 2nd Semester Mid Exam No 05 Date 03-05-2024

Branch MCA Subject Name HCI Branch Code CO

Name of the Student Sk. Nasheema Beebi Regd No 23H41F0040

| Sk. Nasheema 03/05/24 Signature of the Student with date | No. of Additional Sheets attached In figure: 06 In Words: Six | Signature of the Invigilator with date |
|---|---|---|

Short Answer Questions : *(For Evaluator's award only)*

| Q.No. | 1-a | 1-b | 1-c | 1-d | 1-e | Total |
|---|---|---|---|---|---|---|
| Marks | | | | | | |

Subjective Questions : *(For Evaluator's award only)*

| Q.No. | 1 | | | | 2 | | | | 3 | | | | 4 | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | a | b | c | d | a | b | c | d | a | b | c | d | |
| Marks | 10 | | | | 9 | | | | 5 | 5 | | | 5 | 5 | | | 39 |

| Short Answer Questions Marks | Subjective Test Marks (Scaled) | Grand Total | Signature of the Evaluator with date |
|---|---|---|---|
| | | 29 | |

**Instructions to the Candidate :**

1. These Marks will be considered for Internal Marks
2. Write Answer legibly on both side of paper indicating the question number and its sub number
3. Attach Additional Sheets, Graph sheets etc to the main answer book securely
4. This Answer Book should be handed over the Invigilators before leaving the Examination Hall

1.A) • Importance of the User Interface :-

• The importance of the user interface lies in a Critical Role in shaping the overall user experience with the digital system.

• User satisfaction :-

• Usability and efficiency

• productivity and Task Completion

• Reducing Training and Support

• Brand perception and loyalty

• Accessibility and inclusive

• Competitive Advantages

- User engagement and retention
- User-friendly and intuitive interfaces
- Adoption and Acceptance

- User Satisfaction :-
- A user-friendly UI prioritizes user satisfaction.
- When a user find the easy way to navigate, interacts with the system.

- Usability and Efficiency :-
- An effective UI helps users to do things in a efficient and easily.

- Productivity and Task Completion :-
- A well-structure UI helps users to get things done faster and with fewer errors

- Reducing Training and Support :-
- A user-friendly UI helps the positive marking less need for training and keep users coming back, and Customer support.

- Brand perception and Loyalty :-
- A user-friendly UI helps the positive image of the Brand and keep users coming back.

- Accessibility and Inclusive :-
- An Accessible UI Ensures all users regardless of their Capability

- Competitive Advantage :-
  - A Superior UI provides a product an edge over the Competitors.
- User engagement and retention :-
  - An Engaged UI keeps the user interested and coming back for more.
- User feedback and Iterative improvements :-
  - A good UI Allows users to provide feedback and make improvements
- Adoption and Acceptance :-
  - An user-friendly UI Encourages users to accept and use other technologies.
- Good designs :-
  - Enhance User Satisfaction and Experience
  - Improved Usability and Efficiency
  - positive Brand perception and image
  - Competitive advantages in the market.
  - Increase User engagement and retention.
  - Accessibility for the broader user base.
  - Fosters innovation and Creativity
  - Cost effect in the long Run.

- Competitive Advantage :-
  - A Superior UI provides a powerful edge over the Competitors.
- User engagement and retention :-
  - An Engaging UI keeps the user interested and coming back for more.
- User feedback and Iterative improvements :-
  - A good UI Allows users to provide feedback and make improvements.
- Adoption and Acceptance :-
  - An user-friendly UI Encourages users to accept and use other technologies.
- Good designs :-
  - Enhance User Satisfaction and Experience
  - Improved Usability and Efficiency
  - positive Brand perception and image
  - Competitive advantages in the market.
  - Increase User engagement and retention.
  - Accessibility for the broader user base.
  - Fosters Innovation and Creativity
  - Cost effect in the long Run.

2. Ans • Graphical System :-

~ Graphical System refers to a Computer based System that utilizes the graphical elements like icons, images, charts, visual representation. present and interactive with the information and data.

~ Graphical System is represented as a Graphical User Interface (GUI) which provides the visual interface and way to navigate the Operating System.

• characteristics of a Graphical System :-

- Visual Representation
- Graphical User Interface
- Interactive Elements
- Immediate feedback
- Continuously Representation
- User-friendly design
- Data visualization
- multimedia Controls
- Contextual menus
- What you see is what you get.

- Visual Representation :-
  - Information and data present using graphical elements like icons, charts, images, multimedia.
- Graphical User Interface :-
  ~ Graphical user interface provides user interface and allows to interact with the graphical elements through links, gestures and other input methods.
- Interactive elements :-
  - Users can directly manipulate of the elements, such as dragging, rotating and resizing them.
- Immediate feedback :-
  - Users receive visual instant feedback while interacting with the graphical elements.
- Continuous Representation :-
  - Users on the screen correspond directly underlying the content or data, changing in the object and reflects changes in the data.
- A user-friendly design :-
  - Graphical System aims intuitive the easy to use, navigation Reduced learning curve for users.

- Visual Representation :-
- Information and data present using graphical elements like icons, charts, images, multimedia.
- Graphical User Interface :-
~ Graphical user interface provides user interface and allows to interact with the graphical elements through links, gestures and other input methods.
- Interactive elements :-
- Users can directly manipulate of the elements, such as dragging, rotating and resizing them.
- Immediate feedback :-
- Users receive visual instant feedback while interacting with the graphical elements.
- Continuous Representation :-
- Users on the screen correspond directly underlying the content or data, changing in the object and reflects changes in the data.
- A user-friendly design :-
- Graphical System aims intuitive the easy to use, navigation Reduces learning curve for users.

- Data Visualization :-
  - The System provides the Complex data using icons, images (or) visual representation formats for better understanding.
- Multimedia Supports :-
  - The system handles the multimedia Controls like images, audios and videos.
- Contextual menus :-
  - The graphical System provides the Contextual menus with relevant options based on the user's interaction.
- What you see is what you get :-
  - Users sees a real-time representations of their work during the editing and design process.

Ans: (a)

- **Human Interaction with Computers :-**
  - Human interaction with Computers is also known as Human Computer Interaction (HCI).
  - It is Reference to the process of how anything with a digital System and, -technology -through the various Input and Output methods.

- **Input methods :-**
  - Users interact with the Computers through various Input devices such as keyboard, mouse, Visual Organization, Voice Recognition and gestures, motion Sensors.

- **Output methods :-**
  - Computer provides the information and data in a -feedback -to users through the Output devices. Such as Screens, Speaking, haptic -feedback and Visual Indicators.

- **Graphical User Interface :-**
  - It has user visual interfaces icons, images, buttons allows users to interact with the Computer application and digital Systems.

(b)

- Natural language processing (NLP) :-
  - Natural language processing allows users to interact with the Computer using Natural language Commands and Response.
  - As Seen in a voice Assistants Siri and Alexa.
- Touch - Based Interaction :-
  - TouchScreen's enable directly manipulation of a elements, make interactions more intuitive and intuitive.
- Gesture - Based Interaction :-
  - Motion and gesture, it provides users pinching, swipping, rotating them and allows a user to interacting with the System as Natural - hand interaction.
- VR and AR :-
  - In a VR and AR interface Creates a immersive experience, allows users to interactive with the Computer in a digital Content and Spatial Content.
- Multimodal Interaction :-
  - Combining multiple input and Output methods such as Screen and Touch allows users to interact with the Human Computer Interaction.

(b) • Human Interaction Speeds :-

• Human Interaction speeds is significantly depending on the content, individuals interests, using complexity of time.

- Typing speeds
- Reaction Time
- Speech Speed/Rate
- Reading speed
- Gesture Recognization
- Hand-eye Co-ordination
- Decision making
- multitasking

• Type speeds :-

• The average type speed for the individual person is about 40 and 60 words per minute.

• On computer keyboard skilled typists speed is about 80 words per minute.

• Reaction Time :-

• Human Reaction Time is about 200 to 300 milliseconds in the simple task, they are Responses in the visual stimuls.

- These are Based on the age, gender and other factors.

- Speech Rate :-
  - The avg speaking Rate and Conversational Speech speed is about 150 to 160 per minute.
  - These are based on the Speech pace and language Complexity.
- Reading Speed :-
  - Reading Speed is very, but the average Reading Speed is about 200 to 300 words per minutes for the adults.
  - With Comprehension Speed trade- off.
- Gesture Recognition :-
  - Human Gesture Recognition is swift with the people Recognition and therefore Common gestures almost instant.
- Hand- eye Co-ordination :-
  - Human Hand- eye Coordination allows users for rapid responses, such as Catch a ball and performing tasks like drawings.
- Decision making :-
  - The Speed of decision making Various based on the Complexity of the decision.

- Multi-tasking :-
  - Human multitasking is a way, but its generally acknowledgement and shifting btw the tasks.

4. (a) • Goals of Screen Designing :-
  - Designing of the process special objectives that aims and guid the process is Created by a product, System and Interface.

- User-Centralized Design
- Functionality
- usability
- Efficiency
- Feedback Communication
- Visual Appealing
- Efficency
- Innovation and Creativity
- Emotional Connection
- Consistency

- Interaction :-
  - Computers are likely interaction with the users. and that manner is said to be in a user-device.
- Visual Hierarchy :-
  - A users can visual anything in a Hierarchy way.


PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

(An Autonomous Institution)
(Approved by AICTE, New Delhi, Accredited by NAAC 'A' Grade, Permanently Affiliated to JNTUK, Kakinada)
AMALAPURAM-533 201, Dr. B.R. AMBEDKAR KONASEEMA DIST., ANDHRA PRADESH
Ph: 08856-235116, 235189, e-mail: bvcetchairman@gmail.com, visit us: www.bvcetcollege.ac.in

DATE : MON JUL 29 08:49:29 IST 2024

## MCA

| HTNO | SUBJECT | refCode | SM | MID I | SM | MID II | FF | SST | I | TOTAL | SUB TYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 23H41F0001 | 23MC2T07 | 23MC2T07 | 29 | 29 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0002 | 23MC2T07 | 23MC2T07 | 29 | 29 | 29 | 29 | - | - | - | 29.0 | T |
| 23H41F0003 | 23MC2T07 | 23MC2T07 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | T |
| 23H41F0004 | 23MC2T07 | 23MC2T07 | 27 | 27 | 21 | 21 | - | - | - | 26.0 | T |
| 23H41F0005 | 23MC2T07 | 23MC2T07 | 25 | 25 | 22 | 22 | - | - | - | 25.0 | T |
| 23H41F0006 | 23MC2T07 | 23MC2T07 | 28 | 28 | 24 | 24 | - | - | - | 28.0 | T |
| 23H41F0007 | 23MC2T07 | 23MC2T07 | 23 | 23 | 23 | 23 | - | - | - | 23.0 | T |
| 23H41F0008 | 23MC2T07 | 23MC2T07 | 29 | 29 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0009 | 23MC2T07 | 23MC2T07 | 19 | 19 | 27 | 27 | - | - | - | 26.0 | T |
| 23H41F0010 | 23MC2T07 | 23MC2T07 | 18 | 18 | 30 | 30 | - | - | - | 28.0 | T |
| 23H41F0011 | 23MC2T07 | 23MC2T07 | 27 | 27 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0012 | 23MC2T07 | 23MC2T07 | 25 | 25 | 30 | 30 | - | - | - | 29.0 | T |
| 23H41F0013 | 23MC2T07 | 23MC2T07 | 11 | 11 | 27 | 27 | - | - | - | 24.0 | T |
| 23H41F0014 | 23MC2T07 | 23MC2T07 | 29 | 29 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0015 | 23MC2T07 | 23MC2T07 | 29 | 29 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0016 | 23MC2T07 | 23MC2T07 | 24 | 24 | 27 | 27 | - | - | - | 27.0 | T |
| 23H41F0017 | 23MC2T07 | 23MC2T07 | 27 | 27 | 29 | 29 | - | - | - | 29.0 | T |
| 23H41F0018 | 23MC2T07 | 23MC2T07 | 23 | 23 | 30 | 30 | - | - | - | 29.0 | T |
| 23H41F0019 | 23MC2T07 | 23MC2T07 | 23 | 23 | 24 | 24 | - | - | - | 24.0 | T |
| 23H41F0020 | 23MC2T07 | 23MC2T07 | 29 | 29 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0021 | 23MC2T07 | 23MC2T07 | 29 | 29 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0022 | 23MC2T07 | 23MC2T07 | 26 | 26 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0023 | 23MC2T07 | 23MC2T07 | 26 | 26 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0024 | 23MC2T07 | 23MC2T07 | 30 | 30 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0025 | 23MC2T07 | 23MC2T07 | 29 | 29 | 29 | 29 | - | - | - | 29.0 | T |
| 23H41F0026 | 23MC2T07 | 23MC2T07 | 27 | 27 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0027 | 23MC2T07 | 23MC2T07 | 29 | 29 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0028 | 23MC2T07 | 23MC2T07 | 18 | 18 | 24 | 24 | - | - | - | 23.0 | T |
| 23H41F0029 | 23MC2T07 | 23MC2T07 | 27 | 27 | 29 | 29 | - | - | - | 29.0 | T |
| 23H41F0030 | 23MC2T07 | 23MC2T07 | 29 | 29 | 29 | 29 | - | - | - | 29.0 | T |
| 23H41F0031 | 23MC2T07 | 23MC2T07 | 21 | 21 | 29 | 29 | - | - | - | 28.0 | T |
| 23H41F0032 | 23MC2T07 | 23MC2T07 | 23 | 23 | 24 | 24 | - | - | - | 24.0 | T |
| 23H41F0033 | 23MC2T07 | 23MC2T07 | 21 | 21 | 26 | 26 | - | - | - | 25.0 | T |
| 23H41F0034 | 23MC2T07 | 23MC2T07 | 21 | 21 | 29 | 29 | - | - | - | 28.0 | T |
| 23H41F0035 | 23MC2T07 | 23MC2T07 | 19 | 19 | 29 | 29 | - | - | - | 27.0 | T |
| 23H41F0036 | 23MC2T07 | 23MC2T07 | 17 | 17 | 24 | 24 | - | - | - | 23.0 | T |
| 23H41F0037 | 23MC2T07 | 23MC2T07 | 26 | 26 | 24 | 24 | - | - | - | 26.0 | T |
| 23H41F0038 | 23MC2T07 | 23MC2T07 | 29 | 29 | 23 | 23 | - | - | - | 28.0 | T |
| 23H41F0039 | 23MC2T07 | 23MC2T07 | 29 | 29 | 27 | 27 | - | - | - | 29.0 | T |
| 23H41F0040 | 23MC2T07 | 23MC2T07 | 21 | 21 | 25 | 25 | - | - | - | 25.0 | T |
| 23H41F0041 | 23MC2T07 | 23MC2T07 | 20 | 20 | 29 | 29 | - | - | - | 28.0 | T |
| 23H41F0042 | 23MC2T07 | 23MC2T07 | 29 | 29 | 30 | 30 | - | - | - | 30.0 | T |
| 23H41F0043 | 23MC2T07 | 23MC2T07 | 27 | 27 | 24 | 24 | - | - | - | 27.0 | T |
| 23H41F0044 | 23MC2T07 | 23MC2T07 | 29 | 29 | 26 | 26 | - | - | - | 29.0 | T |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23H411 0001 | 23MC 2108 | 23MC 2108 | 30 | 30 | 30 | 30 | - | - | - | 30.0 | 1 |
| 23H411 0002 | 23MC 2108 | 23MC 2108 | 29 | 29 | 28 | 28 | - | - | - | 29.0 | 1 |
| 23H411 0003 | 23MC 2108 | 23MC 2108 | 30 | 30 | 29 | 29 | - | - | - | 30.0 | 1 |
| 23H411 0004 | 23MC 2108 | 23MC 2108 | 30 | 30 | 30 | 30 | - | - | - | 30.0 | 1 |
| 23H411 0005 | 23MC 2108 | 23MC 2108 | 30 | 30 | 30 | 30 | - | - | - | 30.0 | 1 |
| 23H411 0006 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0007 | 23MC 2108 | 23MC 2108 | 29 | 29 | 29 | 29 | - | - | - | 29.0 | 1 |
| 23H411 0008 | 23MC 2108 | 23MC 2108 | 29 | 29 | 25 | 25 | - | - | - | 25.0 | 1 |
| 23H411 0009 | 23MC 2108 | 23MC 2108 | | | | | - | - | - | 0.0 | 1 |
| 23H411 0010 | 23MC 2108 | 23MC 2108 | 28 | 28 | 27 | 27 | - | - | - | 28.0 | 1 |
| 23H411 0011 | 23MC 2108 | 23MC 2108 | 29 | 29 | 28 | 28 | - | - | - | 29.0 | 1 |
| 23H411 0012 | 23MC 2108 | 23MC 2108 | 30 | 30 | 30 | 30 | - | - | - | 30.0 | 1 |
| 23H411 0013 | 23MC 2108 | 23MC 2108 | 29 | 29 | 28 | 28 | - | - | - | 29.0 | 1 |
| 23H411 0014 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0015 | 23MC 2108 | 23MC 2108 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | 1 |
| 23H411 0016 | 23MC 2108 | 23MC 2108 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | 1 |
| 23H411 0017 | 23MC 2108 | 23MC 2108 | 24 | 24 | 24 | 24 | - | - | - | 24.0 | 1 |
| 23H411 0018 | 23MC 2108 | 23MC 2108 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | 1 |
| 23H411 0019 | 23MC 2108 | 23MC 2108 | 28 | 28 | 27 | 27 | - | - | - | 28.0 | 1 |
| 23H411 0020 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0021 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0022 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0023 | 23MC 2108 | 23MC 2108 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | 1 |
| 23H411 0024 | 23MC 2108 | 23MC 2108 | 29 | 29 | 29 | 29 | - | - | - | 29.0 | 1 |
| 23H411 0025 | 23MC 2108 | 23MC 2108 | 29 | 29 | 29 | 29 | - | - | - | 29.0 | 1 |
| 23H411 0026 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0027 | 23MC 2108 | 23MC 2108 | 29 | 29 | 29 | 29 | - | - | - | 29.0 | 1 |
| 23H411 0028 | 23MC 2108 | 23MC 2108 | 29 | 29 | 29 | 29 | - | - | - | 29.0 | 1 |
| 23H411 0029 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0030 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0031 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0032 | 23MC 2108 | 23MC 2108 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | 1 |
| 23H411 0033 | 23MC 2108 | 23MC 2108 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | 1 |
| 23H411 0034 | 23MC 2108 | 23MC 2108 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | 1 |
| 23H411 0035 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0036 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0037 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0038 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0039 | 23MC 2108 | 23MC 2108 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | 1 |
| 23H411 0040 | 23MC 2108 | 23MC 2108 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | 1 |
| 23H411 0041 | 23MC 2108 | 23MC 2108 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | 1 |
| 23H411 0042 | 23MC 2108 | 23MC 2108 | 27 | 27 | 27 | 27 | - | - | - | 27.0 | 1 |
| 23H411 0043 | 23MC 2108 | 23MC 2108 | 28 | 28 | 28 | 28 | - | - | - | 28.0 | 1 |
| 23H411 0044 | 23MC 2108 | 23MC 2108 | 30 | 30 | 30 | 30 | - | - | - | 30.0 | 1 |

| | | | |
|---|---|---|---|
| 5 | 23MC2T03 | DESIGN AND ANALYSIS OF ALGORITHMS | |
| 6 | 23MC2S01 | EMPLOYABILITY SKILLS | |
| 7 | 23MC2L01 | HUMAN COMPUTER INTERACTION | |
| 8 | 23MC2L06 | PYTHON PROGRAMMING LAB | |
| 9 | 23MC2L08 | SOFTWARE ENGINEERING AND DESIGN PATTERNS | |
| 10 | 23MC2L05 | SOFTWARE ENGINEERING AND DESIGN PATTERNS LAB | |

**DATE :** **HOD** **Controller of Examinations** **Principal**

18/1/24

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221