Golden Valley Educational Trust

Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belgaum)

OORGAUM, K.G.F. - 563 120.

Department of Computer Science & Engg.
No.....
Date.....
Dr. T.T.I.T., K.G.F.

BLUE BOOK

Certificate

This is to certify that Mr. / Ms. S. YASHWANTH

bearing **USN.** *No.* 1GV19CS092 *has satisfactorily completed the course of Tests and assignments as prescribed by Visvesvaraya Technological University for* 4th *Semester B.E./ M.Tech, Degree in* CSE 'B' *Branch / Specialization for the academic year* 20-21

for the Subject Micro Controller & Embedded Systems *and Code* 18CS44

For Departmental Use Only :

IA Date	IA	Max Marks	Marks obtained					Signature of Faculty	Signature of Student
			IA (30)	Assign (10)	Quiz (10)	C-Test (10)	Total Marks		
27/5/21	I	40					26		
1/7/21	II						38		
10/8/21	III		18	10			28		
Final Average Marks Obtained							31		

14/1/22

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F. 563120

Signature of HOD

PART - A

1) operational quality attribute :-

operational quality attribute represent relavent quality attribut to the embedded system for operational mode and online mode.

→ There are 6 operational attributes :-

1) Response
2) Throughup
3) Reliablity
4) maintainablity
5) Security
6) Safty.

1) Response :-

* The response of the system depend upon fastness of the computer system.

* It is also an idea of measuring the fastness of the input given to the system.

* How quick it get response by compiling the input and aquirate output.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

2) Through up :-

* It depends up on efficiency of system
* when input is given to the system at what through up at what appropriate output should be needed

3) Reliablity :-

* The process of how much percentage is needed for functioning.
* At what effort of percentage that your code should be functioning.
* Time and Compactablity depends on this process of functioning.

4) maintainablity :-

* The process of maintaing the system with appropirate software.
* maintanence is don where the system should not be hanged during Compilation zone
* It is measured through breakpoint
* If comes under maintaining the entire systems and the running software and not to get distracted at any point of view.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

5) Security:

* The main purpose of security is scalability, compatibility wall protection for the system
* where no other users can interact with the our system by absence of our knowledge
* It is provided for our safetyness, for system safetyness where not to misuse the system.
* Security depends upon fire walls that how much is depended on the system.

6) Safety:

* The system should be safe not to interact or misused the illegal this.
* No threads can be entered when you where safe browsed the system
* The unsafe browsing leads to system failure and other threads will be occure to the system.

2) non operational quality: The qualities is a basic needs which is not a operational quality based on their addresse modes.

⇒ there are 5 nonoperational quality attributes

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F - 563120

1) Testablity or debugablity.

2) Evaluatablity.

3) portablity.

4) Time for prototype and marketing.

5) Cost per unit.

1) Testablity or debugablity.

* The proceu of testing the System how accurate the out put has been given by the System.

* It is don for various field of programs execution with appropriate output.

* To check whether not only the program. to the System also how it is working with Software parts

* main point is to backup code is don while testing each System.

2) Evaluatablity :

* It depend how much efficiency that the System get go through

* the life span of the System depends on the bases of evaluatablity Concepts.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

3) portability:-

* Each system should be portable with each soft - ware designer.
* System should be portable at any cost such that the linking of each Embedded System must be portable at any point of view.
* The system should have the portable of handli - ng all functionaly concepts.

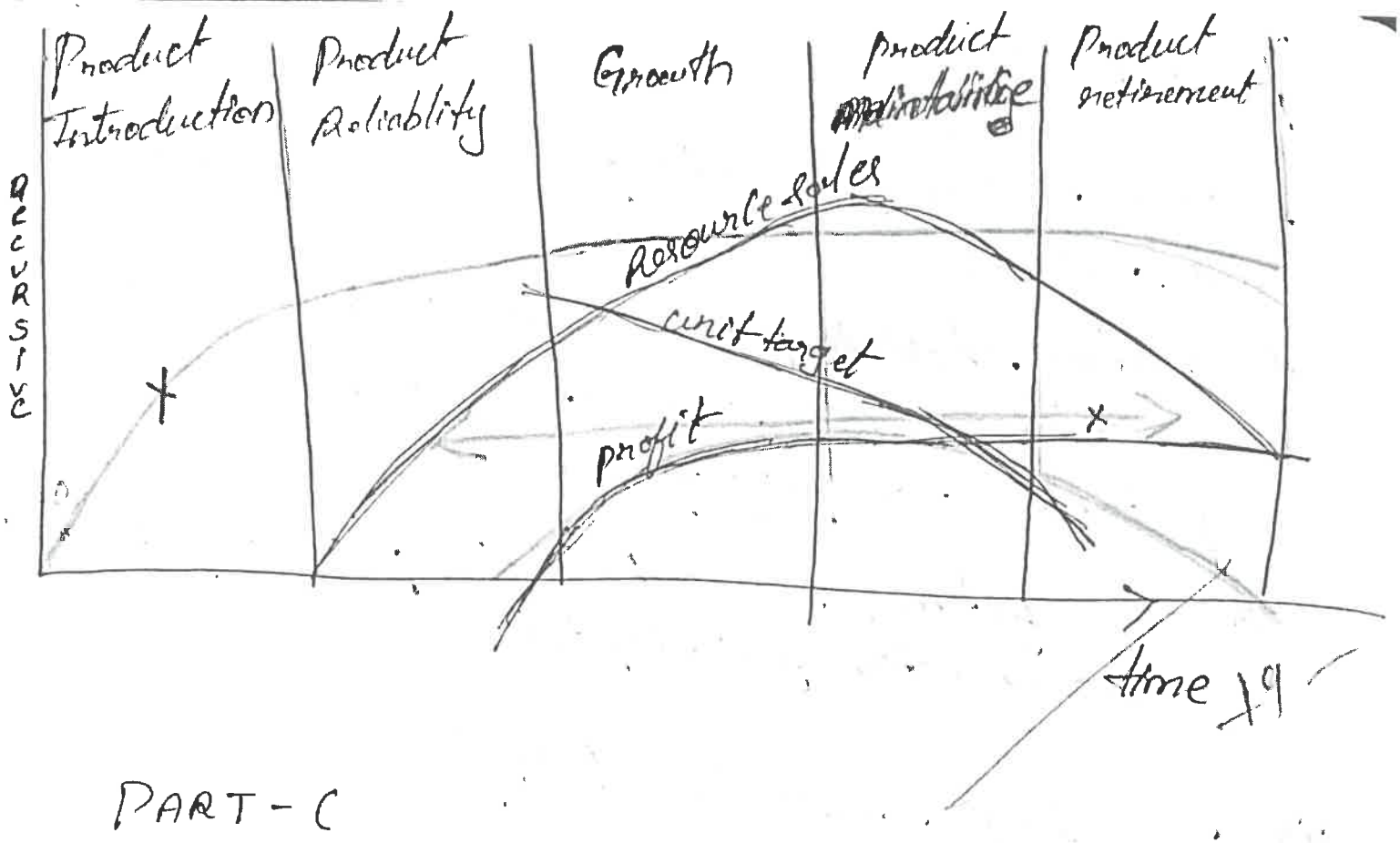
4) Time for prototype & marketing:-

* The taken for the system to be prototyped such that the user can be well wished
* There is a procedure of prototyping for all the system. Time taken is more for each prototype
* After this process the marketing sales has to advatized the system for the sales.

5) Cost per unit:-

* mainly depends upon Cost of each and every system on their improvement
* fixed cost for high system module and normal cost per each system module it depen - ds.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120



PART - C

6) i) Assembly language - Assembler.

* An Assembly language used to Convert Assembly language into machine code.
* The Convertion plan average Assembler
* There are sum software to Convert ASm like keil, funeral etc.
* The Assembler Codes / resources made available
* It Consist of Source file opening in Convertedby assembler object file

* for the file Converted into assembly language.

* These Assemble Code take the user information to the machine understandable Codes and gives the output to the user.

-5-

* Some keys of Assemblers :-

ADD, MULT, SUBS

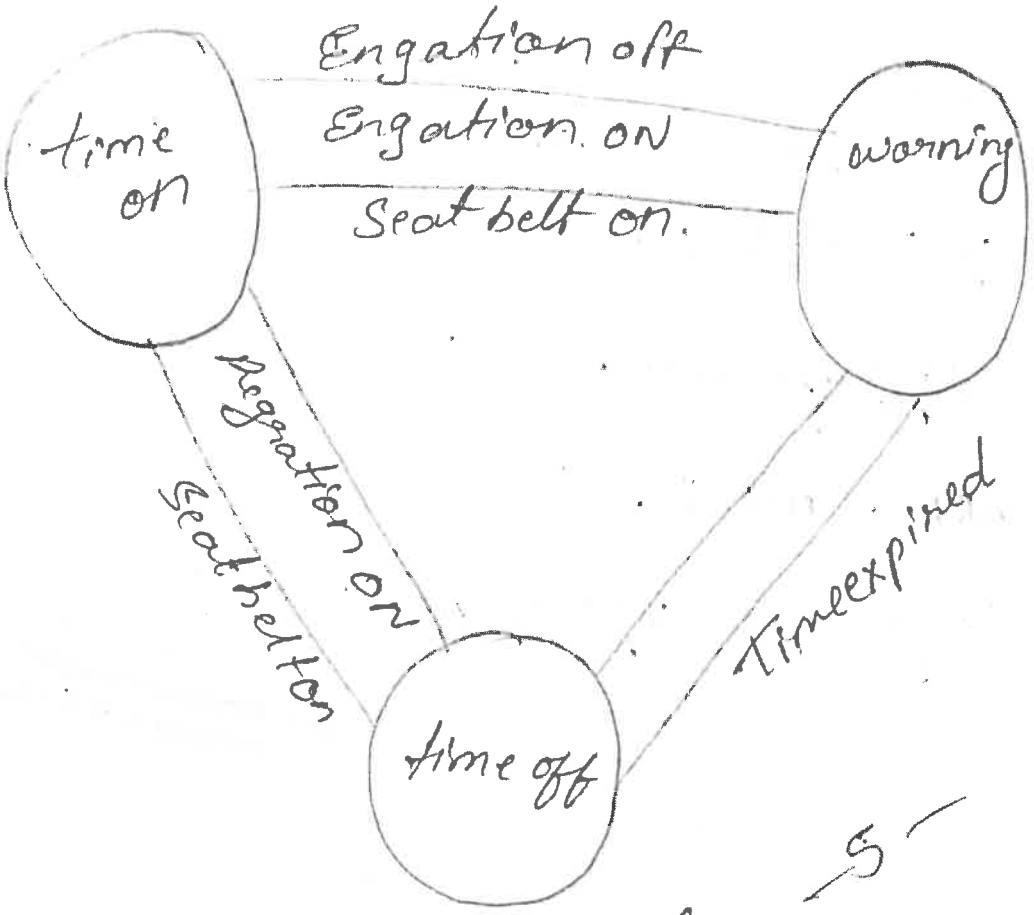
ii) C language v/s Embedded C

*

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum. K. G. F- 563120

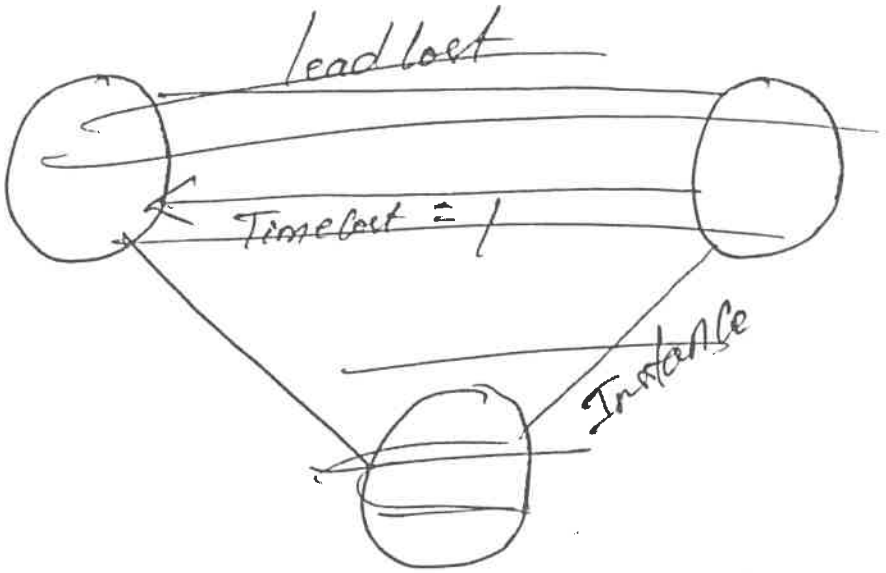
Part-B

4)



static machine model :-

- when seat belts on are engaged off the indication warning doesn't occurs.
- when seat belts off the engaged is on and indication warning occurs.
- there is a limited time to be for interation warning appears.
- when seat belt is ON
- for the certain period of time the indication stops and no warning appear.



PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

49/50

Golden Valley Educational Trust

Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belgaum)

OORGAUM, K.G.F. - 563 120.

Department of Computer Science & Engg.
No.
Date.
Dr. T.T.I.T., K.G.F.

BLUE BOOK

Certificate

This is to certify that Mr. / Ms. Adiba banu

bearing **USN.** *No.* 1GV19CS002 *has satisfactorily completed the course of Tests and assignments as prescribed by Visvesvaraya Technological University for* 3rd *Semester B.E./ M.Tech, Degree in* CSE *Branch / Specialization for the academic year* 2020-21 *for the Subject* Discrete mathematical structure *and Code* 18CS36

For Departmental Use Only :

IA	IA	Max Marks	Marks obtained					Signature of Faculty	Signature of Student
			IA (30)	Assign (10)	Quiz ( )	C-Test ( )	Total Marks		
21/10/20	I	↑	30	10			40		Adiba banu
23/11/20	II		30	10			40		Adiba banu
7/1/21	III	40	13	10			23		Adiba banu
Final Average Marks Obtained		↓					35		Adiba banu

14/1/22

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F-563120

Signature of HOD

Discrete mathematical Structures

Part-C

5. The number of arrangements with

S = 1
O = 3
C = 2
I = 2
L = 2
G = 1
A = 1

$$= \frac{12!}{1!\,3!\,2!\,2!\,2!\,1!\,1!}$$

$= 9979,200$ ways

i. The arrangement in which A & G are adjacent. since A & G are adjacent so take this into a single letter say x.

No of arrangement in which A & G are adjacent $= \frac{11!}{1!\,3!\,2!\,2!\,2!\,1!}$

$= 831,600$ ways

The arrangement of A & G in 2 ways

$= 831,600 \times 2$

$= 1663,200$ ways //

ii. The arrangement in which all the vowels are adjacent.

We have the vowels 6 (ie, O, I, A) with the arrangement,

O = 3
I = 2
A = 1

Discrete mathematical structures

Part-C

5. The number of arrangements with

S = 1
O = 3
C = 2
I = 2
L = 2
G = 1
A = 1

$$= \frac{12!}{1!\,3!\,2!\,2!\,2!\,1!\,1!}$$

= 9979,200 ways

i. The arrangement in which A & G are adjacent. Since A & G are adjacent so take this into a single letter say x.

No of arrangement in which A & G are adjacent $= \frac{11!}{1!\,3!\,2!\,2!\,2!\,1!}$

= 831,600 ways

The arrangement of A & G in 2 ways

= 831,600 × 2

= 16,63,200 ways //

ii. The arrangement in which all the vowels are adjacent.

We have the vowels 6 (A, O, I, A)

with the arrangement,

O = 3
I = 2
A = 1

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Takes this entire vowels into 1

The words others than vowels are S, C, L, G

with the arrangements

S = 1
C = 2
L = 2
G = 1

The arrangement of this is given by 6+1 = 7

So, $\frac{7!}{1!1!2!2!}$

The arrangement of the vowels is,

$\frac{6!}{3!2!1!}$

The number of arrangement

$= \frac{7!}{1!1!2!2!} \times \frac{6!}{3!2!1!}$

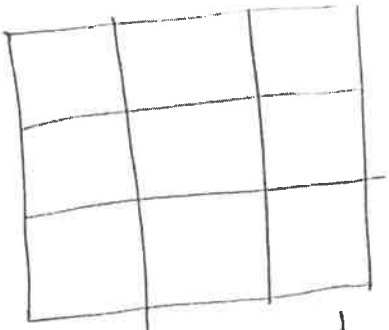
$= 1260 \times 60$

$= 75,600$ ways //

Part-B

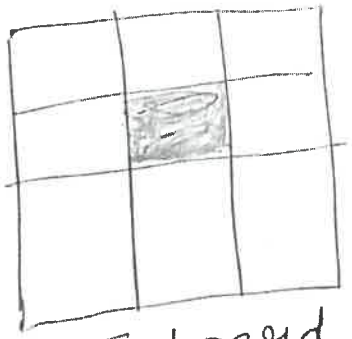
4C Rook polynomial for 3x3 board using the expansion formula,

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120



3×3 board

D board



E-board

In D board, $r_1 = 4, r_2 = 2, r_3 = r_4 = 0$

$\therefore r(D,x) = 1 + 4x + 2x^2$

In E board,

$\therefore r(E,x) = 1 + 8x + 14x^2 + 4x^3$

Expansion formula is given by

$r(C_{3\times3}, x) = x\, r(D,x) + r(E,x)$

$= x(1+4x+2x^2) + 1+8x+14x^2+4x^3$

$= x + 4x^2 + 2x^3 + 1 + 8x + 14x^2 + 4x^3$

$= 9x + 18x^2 + 6x^3 + 1$ //

- is the required expansion formula

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Part-A

1 a.

Let $S(n): 1^2+3^2+---+(2n-1)^2 = (n(2n+1)(2n-1))/3$

Basic step: let $S(1)$ be the statement

$1 = 1((2(1)+1)(2(1)-1))/3$

$1 = 1(3\times1)/3$

$1 = 1$

which is true for $n=1$

Induction step: Let us assume for $n=K$ is true when $K \geq 1$ & let $S(K)$ be the statement

$1^2+3^2+----+(2K-1)^2 = K((2K+1)(2K-1))/3$

Add $(2K+1)^2$ on both the sides

$1^2+3^2+----+(2K-1)^2+(2K+1)^2$

$= K((2K+1)(2K-1))/3 + (2K+1)^2$

$= \frac{1}{3}(2K+1)^2[K$

$= \frac{1}{3}(2K+1)[K(2K-1)+3(2K+1)]$

$= \frac{1}{3}(2K+1)[2K^2-K+2K+1]$

$= \frac{1}{3}(2K+1)[2K^2+K+1]$

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

$= \frac{1}{3}(2K+1)(K+1)(2K+1)$

$= \frac{1}{3}(2K+1)[2K^2 - K + 6K + 3]$

$= \frac{1}{3}(2K+1)[2K^2 + 5K + 3]$

$= \frac{1}{3}(2K+1)(K+1)(2K+3)$

This is the statement S(K+1) is true for whenever S(K) is true for S(K+1) is true

$K \geq 1$

Hence by mathematical Induction S(n) is true //

5-10
HC-5
1a-6

21/30

13/30

PRINCIPAL
Dr. T. Thimmaiah Institute of Technol...
Oorgaum, K. G. F- 563120

Golden Valley Educational Trust

Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belgaum)

OORGAUM, K.G.F. - 563 120.

BLUE BOOK

Certificate

This is to certify that Mr. / Ms. AJAY KUMAR K

bearing **USN.** *No.* 1GV19ME001 *has satisfactorily completed the course of Tests and assignments as prescribed by Visvesvaraya Technological University for* 4th *Semester B.E. / M.Tech, Degree in* MECHANICAL *Branch / Specialization for the academic year* 2020-21 *for the Subject* MEASUREMENTS & METROLOGY *and Code* 18ME46B

For Departmental Use Only :

IA Date	IA	Max Marks	Marks obtained					Signature of Faculty	Signature of Student
			IA (30)	Assign (10)	Quiz (10)	C-Test (10)	Total Marks		
	I	40	28		09		37		
	II	40	30	10	00		40		
11/08/21	III	40	29	10			39		
Final Average Marks Obtained			40				39		

10/1/22

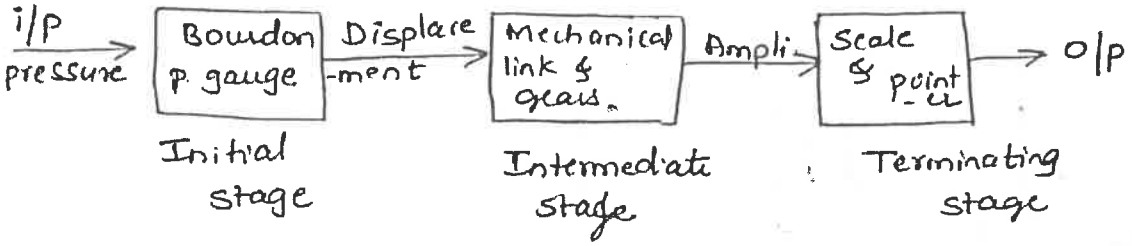
Signature of Head

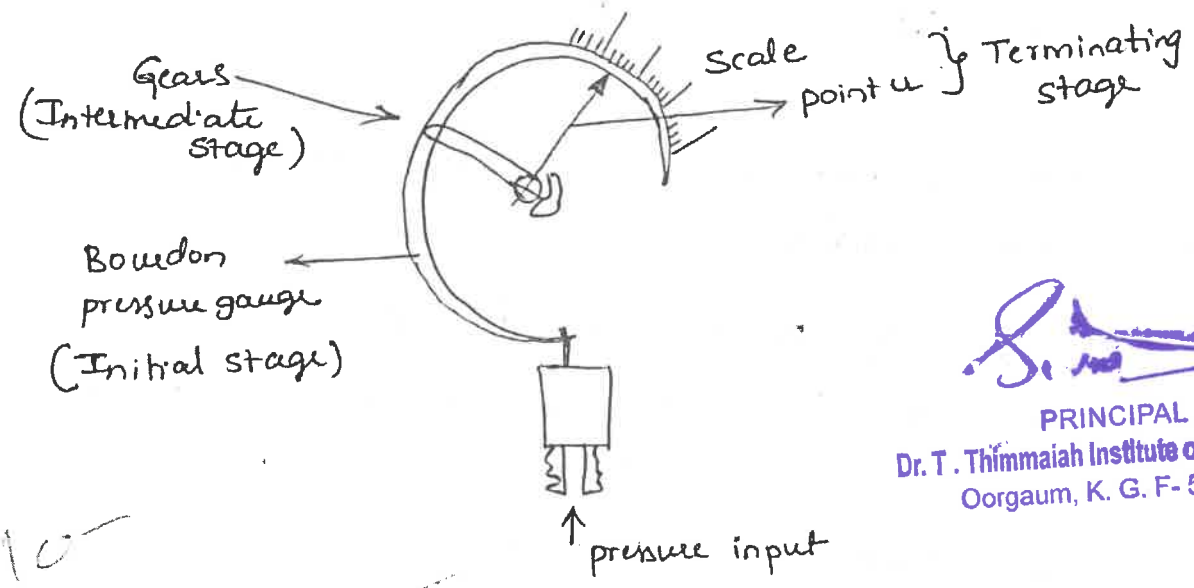
PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

3rd INTERNAL ASSESSMENT TEST

PART-A

1. a. Bourdon pressure gauge





PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

10

(i) The Bourdon pressure gauge consists of Bourdon pressure gauge, Gears and scale & pointer.

(ii) The pressure is given as input to the Block 1 pressure gauge Bourdon (or) at the initial stage where, the pressure displacement occur.

(iii) Further Displacement, next the output of the initial Stage is given as input to the Intermediate stage. It consists of Mechanical links and also gears.

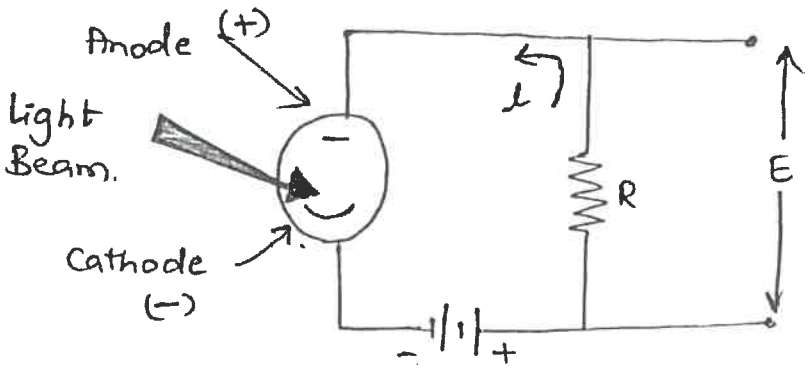
(iv) Lastly the signal (or) pressure signal gets amplifies

and given two the Terminating stage

(v) The terminating stage consists of the scale and pointer of the pressure gauge

(vi) Lastly, the output of the required measurement is obtained

1 b. Photoelectric transducer.



$I = S\phi$

(i) photoelectric transducer converts the light Beam into the usable electric signals.

(ii) It consists of Anode, cathode, Resistor, Battery,

(iii) When the light Beam falls on the cathode, it starts emitting the -ve charges (or) electrons.

(iv) The emitted electrons are attracted towards anode and the electric potential is formed.

(v) The Anode and cathode are enclosed in an envelop (or) a cover of glass (or) silica.

(vi) The envelop consists of the inert gases like Argon (or) neon

(vii) The photoelectric field obtained can be measured by

$I = S\phi$ where, I = photoelectric field
S = sensitivity
ϕ = Illusion of cathod rays

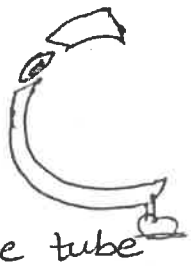
PART-B

4a. There are 3 kinds of pressure sensitive elements used as mechanical transducers

1. Burdon tubes
2. Diaphragms
3. Bellow tubes

(1) Burdon tubes:

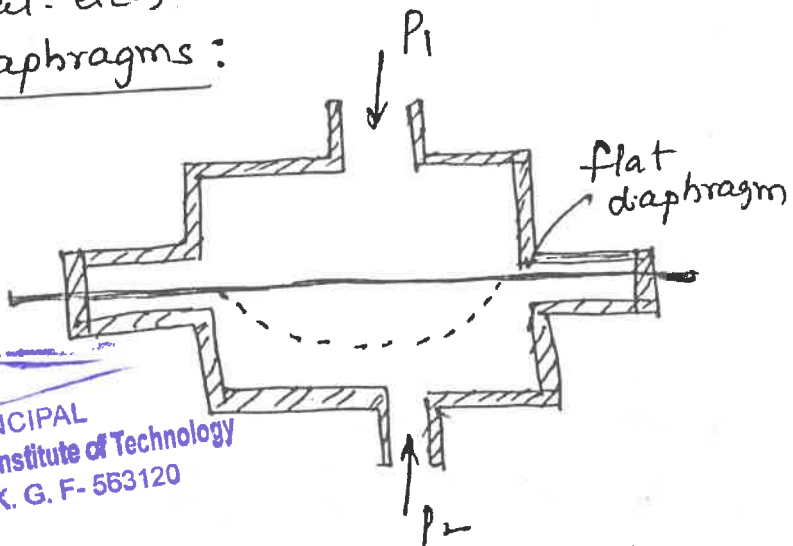
Spherical tube

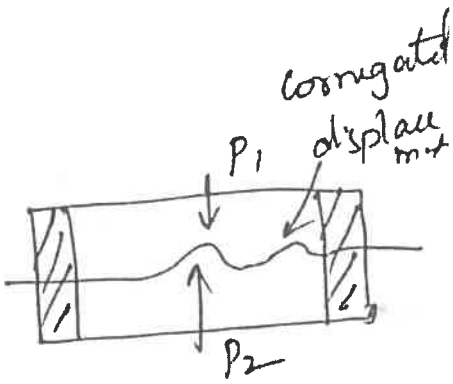


C-type tube

These are the thin metallaic circular shaped strips, whose one end is sealed and physically held, while the other end is let freely to enter the fluid whose pressure is to be measured. Due to the fluid pressure, the tube becomes straight and the pressure can be measured & The commonly used materials are brass, bronze Steel. etc.,

(2) Diaphragms:





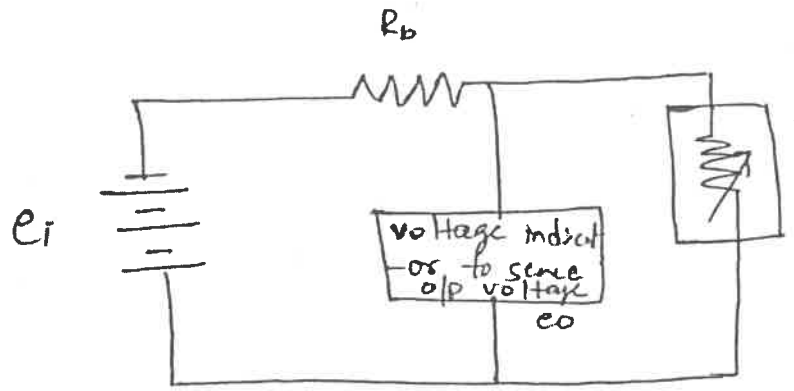
Diaphragm, it is a thin circular shaped plate which is fixed at its circumferences, on the both sides when the pressure difference $P_1 - P_2$ is applied, It

gets affected. and the displacement of the diaphragm is measured by the strain gauges. For the larger deflections corrugated diaphrams are used

(3) **Bellows:** Metallic bellows are thin walled tubes formed by hydraulic press into a corrugated shape. It can be produced in larger diameters upto 300 mm & they are made up of 80% Cu & 20% Zinc.

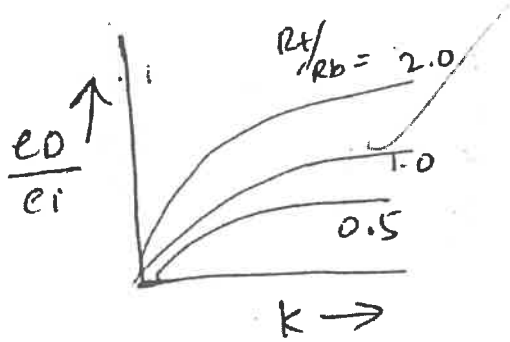
A differential pressure causes a displacement of the bellows, which may be converted into an electrical signals

4 b) **Ballast circuit:**



Resistance type transducer

R_b → Ballast Resistance



I/p & o/p relation for Ballast circuit.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

It is a simple variation of current sensitive ckt & voltage sensitive device is connected across the transducer. It is also called as voltage sensitive circuit.

R_b is the ballast Resistance which should be maintained minimum value for the performance of the circuit. else, the (R_b) ckt records full sensetive voltage

From the ohms law, output current is.

$$i_o = \frac{e_i}{R_b + R_t \cdot k}$$

If e_o is the voltage across the circuit which is indicated by the voltage, indicator, then the O/P voltage indicated is $e_o = i_o (kR_t)$

$$e_o = \frac{e_i}{R_b + k \cdot R_t} \cdot kR_t$$

$$\frac{e_o}{e_i} = \frac{kR_t}{R_b + kR_t}$$

PART C

5 a) Primary transducer

① In pressure measurement burdon tube are primary transducers

② The force is detected by the column in Lit so it is called primary transducer

③ It is a mechanical device.

④ Ex: load cells

Secondary transducer

① LVDT is secondary Transducer

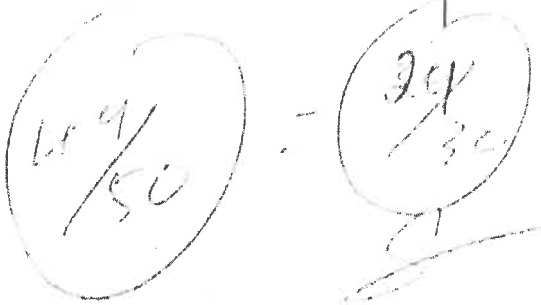
② Output of primary transducer converts into useful output signal is known as secondary transducer

③ It is a electrical device

④ Ex: Strain gauge

5 b)

Active transducer	Passive transducer
① simple in design.	① Complicated in design.
② low Resolution	② High Resolution
③ The transducer which generates the output in the form of voltage or current, without any external energy source is known as active transducer	③ The transducer whose internal parameters like capacitance, resistance, inductance changes because of the input signal.
④ Working principle is: Draw energy from the measurand source	④ Working principle is: Take power from the external source which changes the physical properties of transducers.
⑤ Ex: Photovoltaic cell, Thermocouple	⑤ Ex: Thermistor, Differential transformer, etc.



14/1/22

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Golden Valley Educational Trust

Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belgaum)

OORGAUM, K.G.F. - 563 120.

BLUE BOOK

Certificate

This is to certify that Mr. / Ms. Kanisha.R

bearing **USN.** *No.* 1GV19EC017 *has satisfactorily completed the course of Tests and assignments as prescribed by Visvesvaraya Technological University for* 3rd *Semester B.E./ ~~M.Tech~~, Degree in* ECE *Branch / Specialization for the academic year* 2020-20

for the Subject Digital System design *and Code* 18EC34

For Departmental Use Only :

IA Date	IA	Max Marks	Marks obtained					Signature of Faculty	Signature of Student
			IA (30)	Assign (10)	Quiz (10)	C-Test (10)	Total Marks		
	I	40	22.8	9.9	—	—	32		Kanisha.R
	II	40	14.4	—	9	—	23.		Kanisha.R
	III	40	8.4	8.6	—	—	17		Kanisha.R
Final Average Marks Obtained							24		Kanisha.R

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Signature of the Department
Head of the Department
Dept. of Electronics and Communication Engg.
Dr. T.Thimmaiah Institute of Technology
Oorgaum, K.G.F.- 563 120.

06/01/21

Part-A

1.a)

i) SISO [Serial in Serial out]

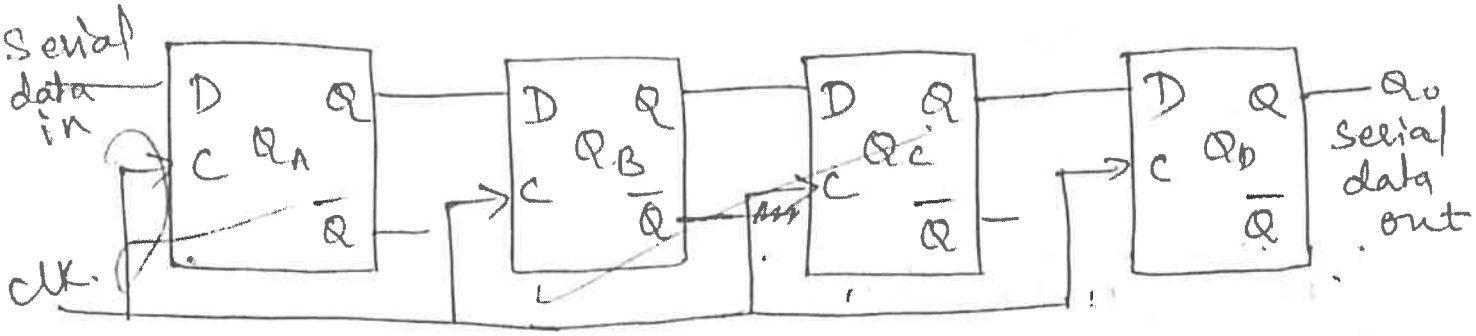


fig: Serial in Serial out Shift register

* fig illustrates the Serial in serial out unidirectional shift register constructed using D-flipflop.
* The Serial in data is 1110.
* when ~~data~~ Serial input is given i.e. Din=0, on application of clock pulse. the ~~data~~ bit stored in 1st flipflip. is shifted to the 2nd flipflop.

$Q_A Q_B Q_C Q_D = 0XXX..$

* when ~~data~~ Serial input is given i.e Din=1, on application of clock pulse. the previous bit stored in 1st flipflop is shifted to 2nd flipflip and the previous bit stored in 2nd flipflop is shifted to 3rd and so on.

$Q_A Q_B Q_C Q_D = 10XX.$

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

* when Serial input is given i.e Din=1, on application of clock pulses. the previous bit stored in 1st flipflop is shifted to 2nd flipflop and so on

$Q_A Q_B Q_C Q_D = 110X.$

* when SI is given. i.e $D_{in} = 1$, on application of clock pulse. then previous bit stored in 1st flipflop is shifted to 2nd flipflop and so on.

$Q_A Q_B Q_C Q_D = 1110.$

* After application of 7 clocks, the serial out data appears at Q_D, one bit at a time.

CLK	Q_A	Q_B	Q_C	Q_D
X	X	X	X	X
1	0 → 0	X	X	X
2	1 → 1	0	X	
3	1 → 1	1	0	
4	1 → 1	1	1	1
5	X → X	1	1	
6	X → X	X	X	1
7	X → X	X	X	X

Serial data out.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

ii) SIPO [Serial in parallel out]

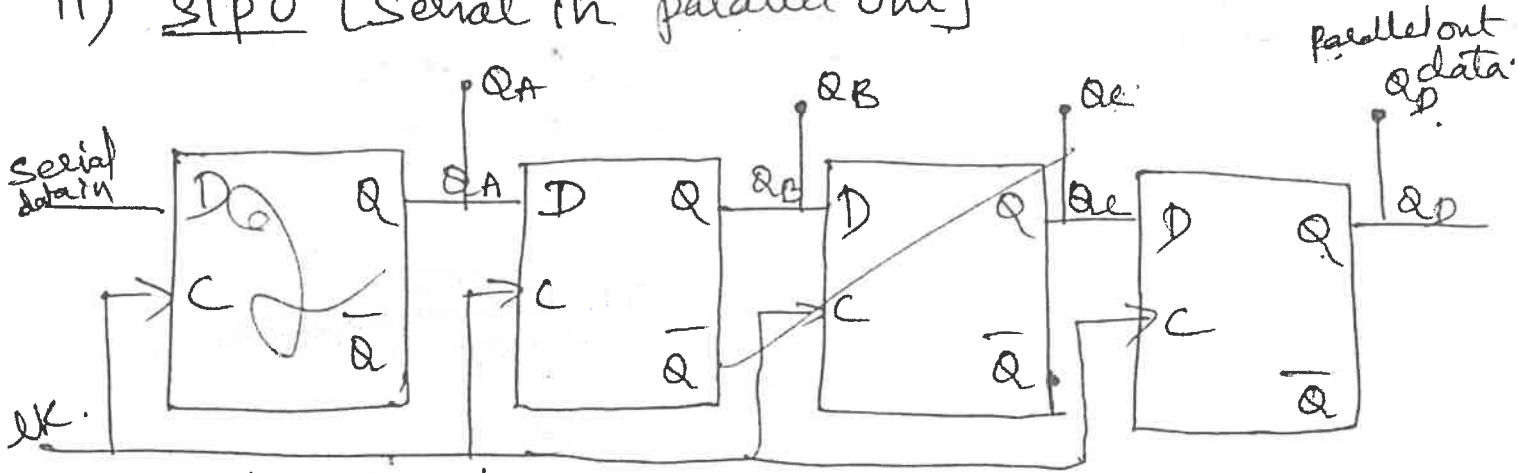


fig: Serial in parallel out.

* fig illustrates Serial in parallel out shift register constructed using D flip flop.
* Serial in data is 1110.
* when SI is given i.e $D_{in}=0$, on application of clk the bit stored in 1st flipflop. is shifted to 2nd flipflop.

$Q_A Q_B Q_C Q_D = 0XXX.$

* when SI is given. i.e $D_{in}=1$, on application of clk the previous bit stored in 1st flipflop is shifted to 2nd flipflop & so on. $Q_A Q_B Q_C Q_D = 10XX.$
* when SI is given. i.e $D_{in}=1$, on application of clk pulse. the previous bit stored in 1st flipflop is shifted to 2nd flipflop and so on.

$Q_A Q_B Q_C Q_D = 110X.$

* when SI is given. i.e $D_{in}=1$, on application of clk pulse. the previous bit stored in 1st flipflop is shifted to 2nd flipflop and so on.

$Q_A Q_B Q_C Q_D = 1110.$

* After application of 4 clocks the output appears at $Q_A Q_B Q_C Q_D$ as 1110, parallely.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

CLK	Q_A	Q_B	Q_C	Q_D
X	X	X	X	X
1	0	0	X	X
2	1	1	0	X
3	1	1	1	0
4	1	1	1	1

clk	Q_A	Q_B	Q_C	Q_D
X	X	X	X	X
1	0	X	X	X
2	1	0	X	X
3	1	1	0	X
4	1	1	1	0

~~patter~~ parallel data out.

part-B

4.a) i) Three unique Sequence i.e 0, 1, 2 hence we use mod 3 counter

No of flipflops = 2.

functional table

J	K	Q+
0	0	Q+
0	1	0
1	0	1
1	1	$\overline{Q+}$

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Next state table

J	K	Q	Q+
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0

Application table

present state	Next state	flipflop inputs	
Q	Q+	J	K
0	0	0	X
0	1	1	X
1	0	X	1
1	1	X	0

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

excitation table

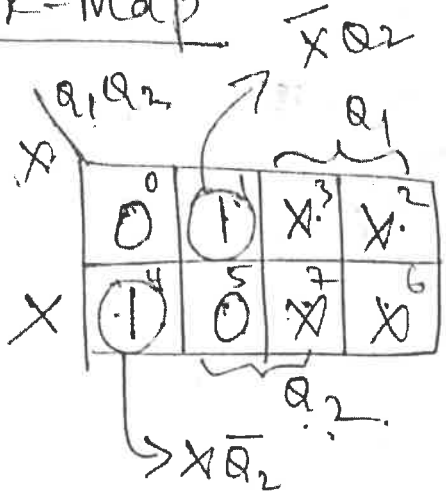
present state			Next state			flip-flop inputs					
Q_2	Q_1	Q_0	Q_2^+	Q_1^+	Q_0^+	J_0	K_0	J_1	K_1	J_2	K_2

Excitation table

input	present state		Next state		flipflop inputs				output
X	Q_1	Q_2	Q_1^+	Q_2^+	J_1	K_1	J_2	K_2	Y
0	0	0	0	1	0	X	1	X	0
0	0	1	1	0	1	X	X	1	1
0	1	0	0	0	X	1	0	X	1
0	1	1	X	X	X	X	X	X	X
1	0	0	1	0	1	X	0	X	0
1	0	1	0	0	0	X	X	1	0
1	1	0	0	1	X	1	1	X	0
1	1	1	X	X	X	X	X	X	X

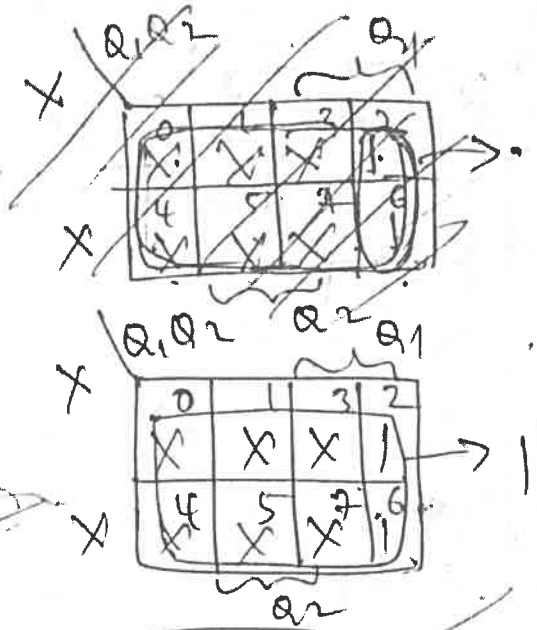
PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

K-Map

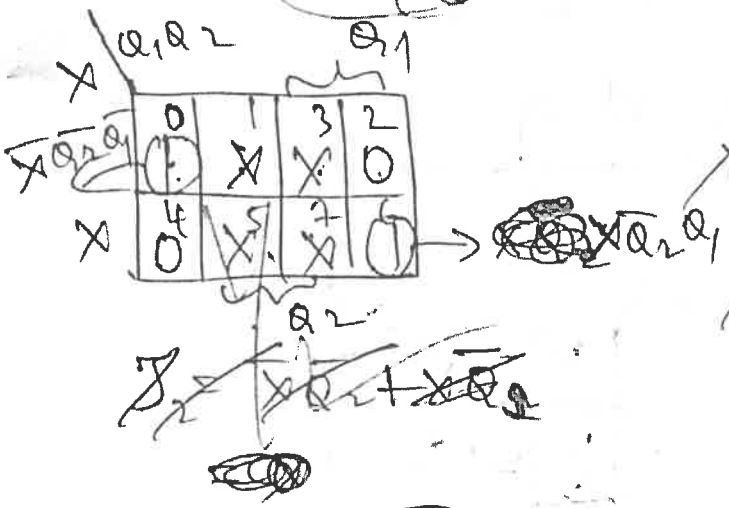


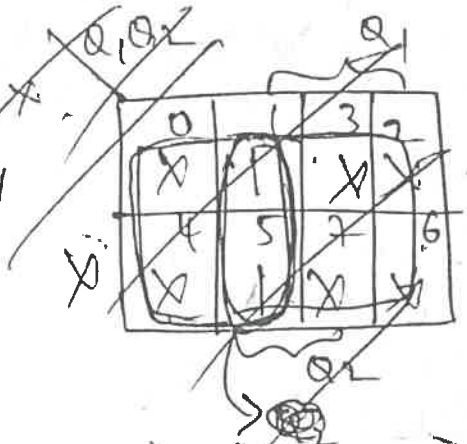
$$J_1 = \bar{X}Q_2 + X\bar{Q}_2$$

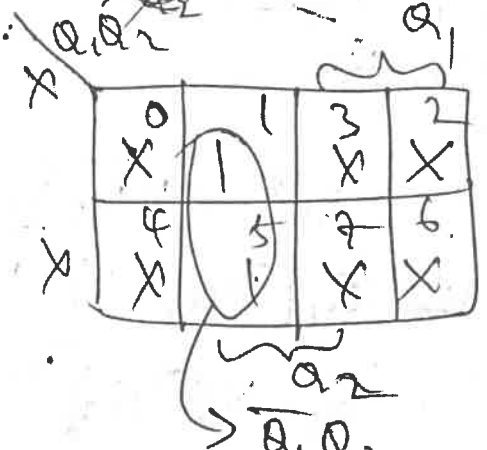
$$J_1 = \bar{Q}_1(X \oplus Q_2)$$



$K_1 = 1$







$$J_2 = \bar{X}\bar{Q}_2\bar{Q}_1 + X\bar{Q}_2Q_1$$

$$= \bar{Q}_2(\bar{X}\bar{Q}_1 + XQ_1)$$

$$= \bar{Q}_2(X \oplus Q_1)$$

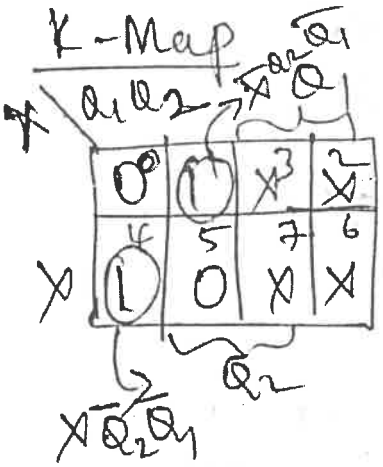
$$K_2 = \bar{Q}_1Q_2$$

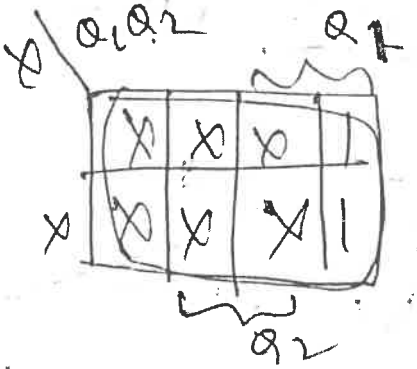
PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

ii) Excitation table.

Input	present state		Next state		flipflop inputs				output
X	Q_1	Q_2	Q_1^+	Q_2^+	J_1	K_1	J_2	K_2	Y
0	0	0	0	1	0	X	1	X	0
0	0	1	1	0	1	X	X	1	1
0	1	0	0	0	X	1	0	X	1
0	1	1	X	X	X	X	X	X	X
1	0	0	0	1	1	X	0	X	0
1	0	1	1	0	0	X	X	1	1
1	1	0	0	0	X	1	1	X	1
1	1	1	X	X	X	X	X	X	X

K-Map





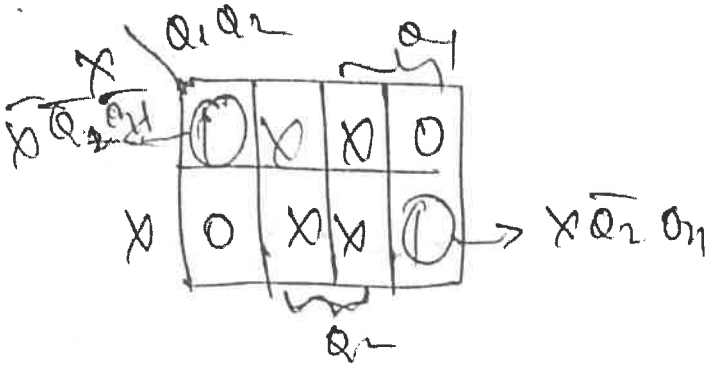
$K_1 = 1$

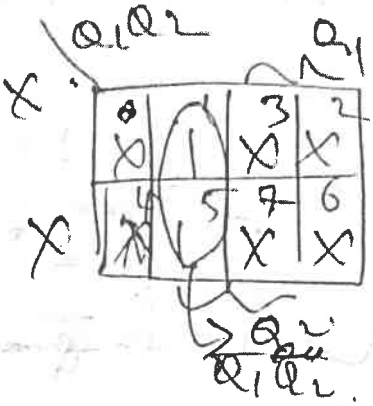
$J_1 = \bar{X}Q_2\bar{Q}_1 + X\bar{Q}_2\bar{Q}_1$

$= \bar{Q}_1(\bar{X}Q_2 + X\bar{Q}_2)$

$= \bar{Q}_1(X \oplus Q_2)$

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120



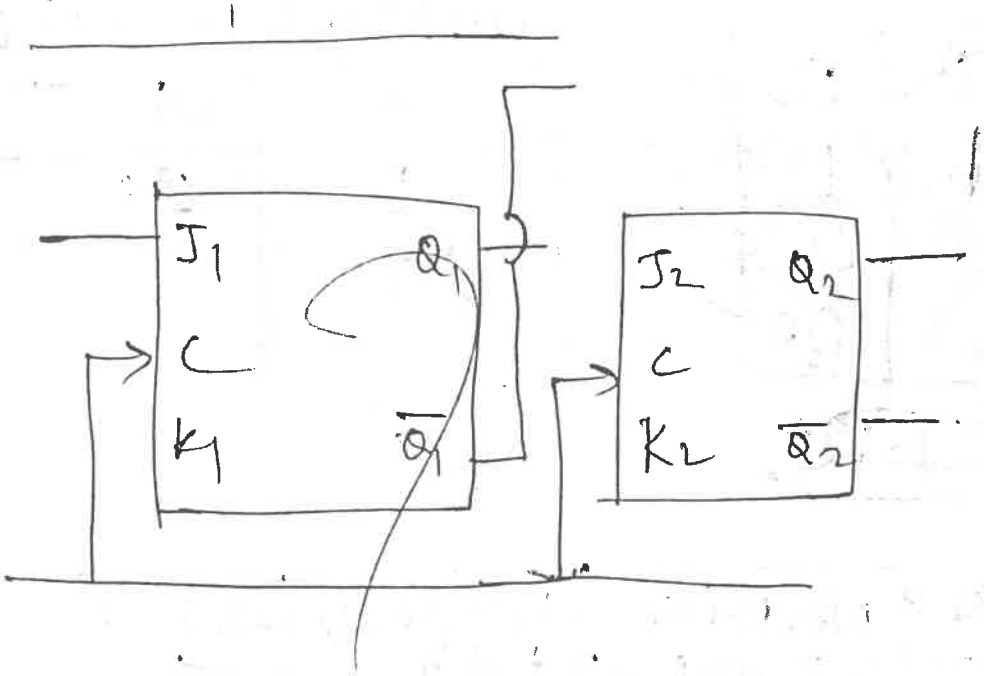


$$J_2 = \bar{X}\,\bar{Q}_2\bar{Q}_1 + X\bar{Q}_2Q_1$$

$$= \bar{Q}_2(\bar{X}\bar{Q}_1 + XQ_1)$$

$$J_2 = \bar{Q}_2(X \oplus Q_1).$$

$$\boxed{k_2 = \bar{Q}_1Q_2}$$



PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

4b). function table.

T	Q+
0	Q+
1	$\overline{Q}$+

Next state table

T	Q	Q+
0	0	0
0	1	1
1	0	1
1	1	0

Application table

present state	Next state		
Q	Q+	J	K
0	0 → 1		

Application table

present state			Next state			flip flop inputs					
Q_2	Q_1	Q_0	Q_2^+	Q_1^+	Q_0^+	J_0	K_0	J_1	K_1	J_2	K_2
0	0	0									
0	0										

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Application table

P.S	N.S	T
0	1	1
1	0	1

P.S	N.S	T
0	1	0
1	0	1

Application table

P.S	N.S	T
0	0	0
0	1	1
1	0	1
1	1	0

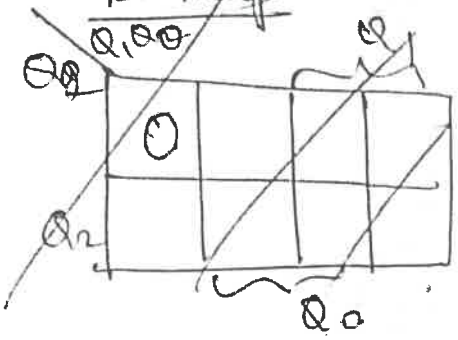
Excitation table

Present state			Next state			flipflop Inputs		
Q_2	Q_1	Q_0	Q_2^+	Q_1^+	Q_0^+	T_0	T_1	T_2
0	0	0	0	1	0	0	1	0
0	0	1	0	0	0	1	0	0
0	1	0	0	1	1	1	0	0
0	1	1	1	1	0	1	0	1
1	0	0	X	X	X	X	X	X
1	0	1	0	0	1	0	0	1
1	1	0	1	0	1	1	1	0
1	1	1	X	X	X	X	X	X

14/1/22
PRINCIPAL
Dr. T. Thimmaiah Institute of Techn
Oorgaum, K. G. F- 563120

K-Map

Q.00



Part A	Part A	Part C
1a. 9.5	4a 3.5	X.
	4b 1	
9.5	4.5	

@ 12/1/21

14/50

8.4/30

No of pages used - (11)

Golden Valley Educational Trust

Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belgaum)

OORGAUM, K.G.F. - 563 120.

Department of Civil Engineering
No.
Date
Dr. T.T.I.T., K.G.F.

BLUE BOOK

Certificate

This is to certify that Mr. / Ms. Chandana. J

bearing **USN.** *No.* 1GV18CV001 *has satisfactorily completed the course of Tests and assignments as prescribed by Visvesvaraya Technological University for* 6th *Semester B.E./ M.Tech, Degree in* Civil *Branch / Specialization for the academic year* 2021 *for the Subject* Solid waste Management *and Code* 18CV642

For Departmental Use Only :

IA Date	IA	Max Marks	Marks obtained					Signature of Faculty	Signature of Student
			IA (30)	Assign (10)	Quiz (10)	C-Test (10)	Total Marks		
	I	40	28	10	–	–	38		
	II		25	–	10	–	35		
18/8/21	III		28	–	–	8	34		
Final Average Marks Obtained							36/40		

10/1/22
PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Signature of HOD
Head of the Department
Dept. of Civil Engineering
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K.G.F. - 563 120

SOLID WASTE MANAGEMENT

III Internals (18CV64)

Part - A

1.(a) **Hazardous waste :-** Waste that pose a substantial danger immediately or over a period of time to human, plants are classified as hazardous waste.

A waste is classified as hazardous if it exhibits any of the following characteristics.

* Ignitibility
* Corrosivity
* Reactivity
* Toxicity.

In the past, hazardous waste often grouped into four categories

* Radioactive substances
* Chemical
* Biological waste
* Flammable waste
* Explosives.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

The principal sources of hazardous bio waste are hospital and biological research institutes. Hazardous waste are generated in limited amounts throughout most of the industrial activities.

collection and disposal of hazardous waste

Most wastes generated in the laboratories and shops located on campus are prohibited from disposal in the regular trash or down the drain. Many of these wastes are regulated under the federal Resource conservation and Recovery Act (RCRA).

The term hazardous waste is defined under RCRA as solids, liquids, and gases that exhibit certain characteristics or are specifically listed in the rules. Hazardous waste is regulated under a "cradle to grave", concept, meaning that the waste is tracked via written records from the time it becomes a waste, and that ownership remains with the generator forever. therefore, The best method to reduce risk of future remediation cost is to reduce the amount of hazardous waste under RCRA as solids, liquids, and gases that exhibit certain characteristics or are specifically listed in the rules. Hazardous waste is regulated under a

It is essential to consider the amounts and types of wastes that will be generated when a project is in the proposal stage in order to ensure that a disposal method exists that is both legal and affordable, and to minimize the amount of waste generated. Every person responsible for the generation of waste at

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Michigan Technological University must understand the proper disposal procedures and the requirements of the Michigan hazardous waste rules under RCRA

1.(b) Biomedical waste :-

is any kind of waste containing infectious materials. It may also include waste associated with the generation of biomedical waste that visually appears to be of medical or laboratory origin (eg. packaging, unused bandage, infusion kit) as well research laboratory waste containing biomolecules or organisms that are restricted from environmental release

Biomedical waste may be solid or liquid. Examples of infectious waste include discarded blood, sharps, unwanted microbiological cultures and stocks, identifiable body parts, other human or animal tissue, used bandage and dressings discarded gloves, other medical supplies that may have been in contact with blood and body fluids. Waste sharps include potentially contaminated used (and unused discarded) needles, scalpels, lancets and other devices capable of penetrating skin

Biomedical waste is generated from biological, medical sources and activities, such as diagonosis, prevention or treatment of disease. Common generators (or producers) of biomedical waste include hospitals, health, clinics, nursing homes, emergency medical services medical.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Medical waste Disposal :-

Stage 1: collecting & segregating

The biomedical waste has to be collected in containers that are resilient and strong from breakage during the handling process. Do not place sharps, used needle, syringe, or other contaminated tool in common waste disposal or recycle bin because the entire waste will be infectious by doing so. The segregation also needs to be performed between the liquid and solid biomedical waste products. categorizing the medical waste with correct segregation to isolate and manage each waste in the proper way. For this purpose, the segregation come in colored waste containers. label coding and plastic bags.

storage & water :-

storage refers to keeping the waste until it is located on-site or transported off-site for treatment or disposal. There are many options and containers for storage. Regulatory agencies may limit the time waste can remain in storage. Handling is the act of moving biomedical waste b/w the point of generation, accumulation area, storage, location and on-site treatment facilities, workers who handle biomedical waste and must observe standard precautions.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K.G.F-563120

Part-B

3(a) (i) Energy Recovery operation :-

Processes like incineration and anaerobic digestion not only provide sources of energy, but they also reduce waste volume

The term "Energy recovery" often is applied only to a narrow number of methods for converting waste into energy. when in fact it, applies to a broad range of technologies used to create heat, electricity or fuel

Energy Recovery gives government and business another way to reduce their waste streams. After recyclable materials have been removed, the remaining waste can be treated to release energy.

According to a 2014 columbia university study, if all of the unrecycled waste diverted from landfills in the united states were recovered for energy generation, it could power more than 66 million American homes, a total of 162 MWh of electricity. This could reduce coal consumption for power generation by 108 million tons.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

(ii) significance of Reuse in solid waste :-

Reuse is the second preferred waste management option after waste reduction. Reuse is the practice of using a material over and over again in its current form. The essence of reuse is that it preserves some or all of the energy and materials that went into making an item. society has long embraced the practice of reuse by finding alternate uses for an item rather than disposing or recycling it. some common Examples, clothing, kitchen wares etc, it may also include using empty food containers to store leftovers or reusing plastic grocery sacks to line trash containers or pick up after pets.

/ 10 /

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

3(b) An incinerator can destroy and remove at least 99.99 percent of each harmful chemical in the waste it processes when some extremely harmful chemicals are present. EPA requires that an incinerator show it can destroy and remove at least 99.9999 percent of contaminants in the waste. Ash remaining at the bottom of the combustion chamber likely will require disposal as a hazardous waste landfill. However, the amount of material that requires disposal after incineration is much less than the initial amount of waste that was burned. The following are types of incinerators

- Rotary kiln
- Fluidized BED
- Liquid injection
- Multiple Hearth
- Catalytic combustion
- waste - Gas flare
- Direct - Flame

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Often, rotary kiln, fluidized bed, and liquid injection are the most prevalent — in Industry because of their applicability to large scale use and their versatility. One other characteristic that all three type of incinerator (rotary kiln, fluidized bed, and liquid injection) share is that they can all be operated in a pyrolysis or oxygen

stained mode. Wastes with high calorie value that are capable of releasing great heat content are most appropriate for this kind of operation. Direct-flame incineration, all the current incinerators range are known as combustion incinerators the optimal temperature for combustion of mixed solid waste is in the range from 1400 – 1600 degrees.

- Waste volume Reduction
- Destruction of combustible toxin
- Destruction of pathogenically contaminated material
- Energy Recovery.

q1/2 Part - C

5. Incineration :-

Incineration is a waste treatment process that involves the combustion of substance contained in waste materials. Industrial plants for waste incineration are commonly referred to as waste-to-Energy facilities. Incineration and other high-temperature waste treatment systems are described as "thermal treatment".

The air pollution control incinerators

The process called incineration or combustion – chemically, rapid oxidation – can be used to convert VOCs and other gaseous hydrocarbon pollutants to carbon dioxide

and water. Incineration of VOCs and hydrocarbon fumes usually is accomplished in a special incinerator called an afterburner. To achieve complete ~~Con~~. in Environmental Engineering, any variety of means employed to limit damage done to the Environmental by the discharge of harmful substances of Energies, specific means of pollution control might include refuse disposal system such as sanitary landfill, Emission control system for automobile, sedimentation tanks in sewerage systems Etc Electrostatic precipitators of impurities from industrial gas, or the practice of recycling for full treatment. of major areas of pollution control., see air pollution control, waste water treatment, solid - waste management, and hazardous waste management -

A - 14 - 5½ - 9½

B - 5 - 10 3½ - 9½

C - 5 - 9½

37/50 : 28/50

21/8/21

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Golden Valley Educational Trust

Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belgaum)

OORGAUM, K.G.F. - 563 120.

BLUE BOOK

Certificate

This is to certify that Mr. / Ms. DEEPIKA·M

bearing USN. No. 1GV17CS016 *has satisfactorily completed the course of Tests and assignments as prescribed by Visvesvaraya Technological University for* VII th *Semester B.E./ M.Tech, Degree in* COMPUTER SCIENCE *Branch / Specialization for the academic year* 2020-21 *for the Subject* ADVANCED COMPUTER ARCHITECTURE *and Code* 17CS72

For Departmental Use Only :

IA Date	IA	Max Marks	Marks obtained					Signature of Faculty	Signature of Student
			IA (30)	Assign (10)	Quiz (10)	C-Test (10)	Total Marks		
26/10/20	I	40	34	7	—	—	34		Deepika.M
09/11/20	II	40	20	10			30		Deepika.M
25/12/20	III	60	15	10	—	—	25		Deepika.M
Final Average Marks Obtained		40	34 + [illegible] 25 =				29.6 ≈ 30		Deepika.M

14/1/22

PRINCIPAL

Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Signature of HOD

28/12/20.

THIRD INTERNALS.

PART A

Vector Access Memory.

The vector operands move from the main memory to the vector registers. These paths are usually pipelined by various instructions.

The three different vector Access Memory are:

i) C - Access memory.

ii) S - Access memory.

iii) C/S - Access memory.

i) C - Access Memory.

- It is a m-way low-order memory structure.
- It allows m words to be accessed concurrently and to be overlapped.
- Each access structure in the module is staggered.
- The low bit 'a' selects the module, and the high order bit 'b' selects the words in the module, where $m = 2^a$ and $a+b = n$, is the address length.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

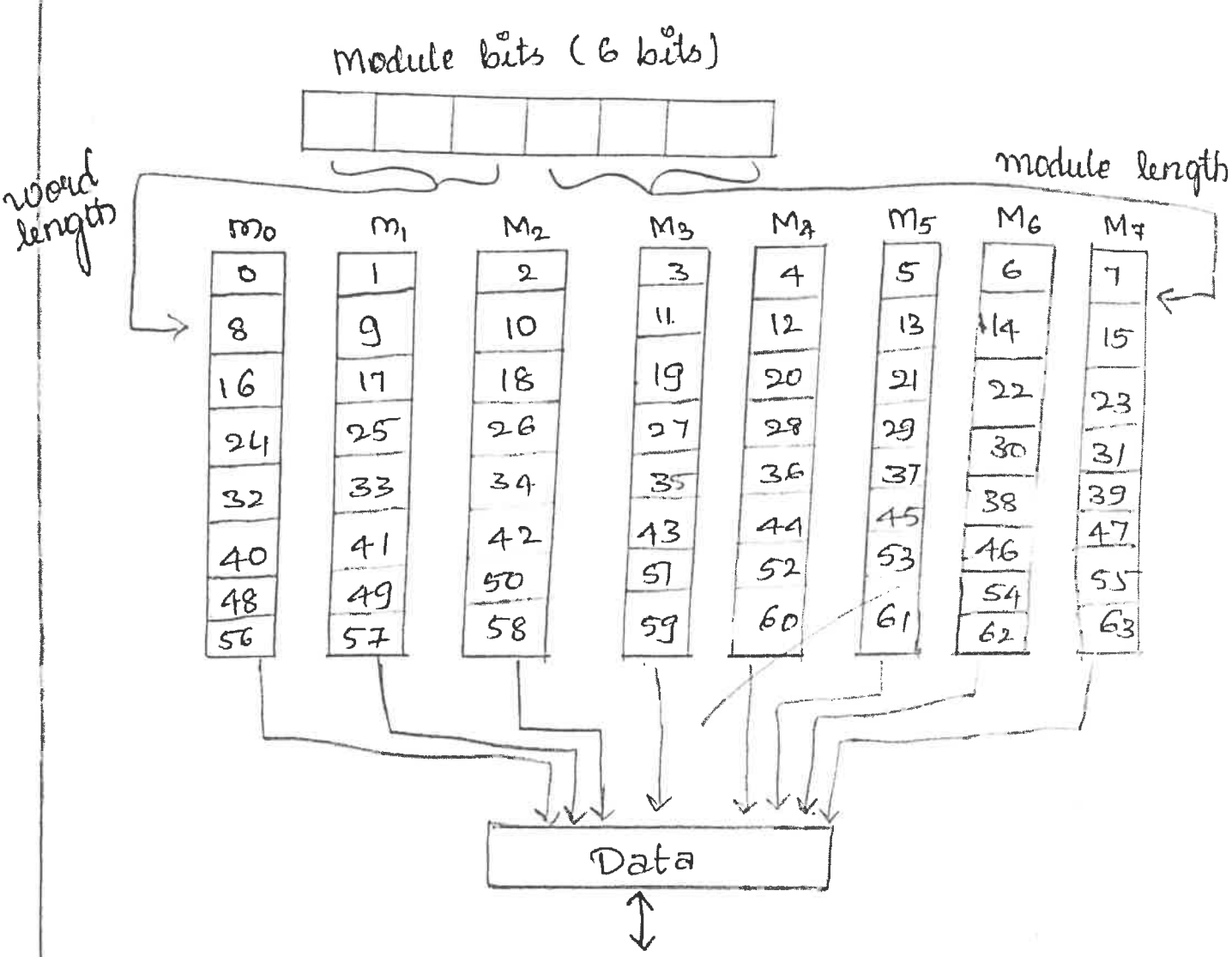


Fig: (a)

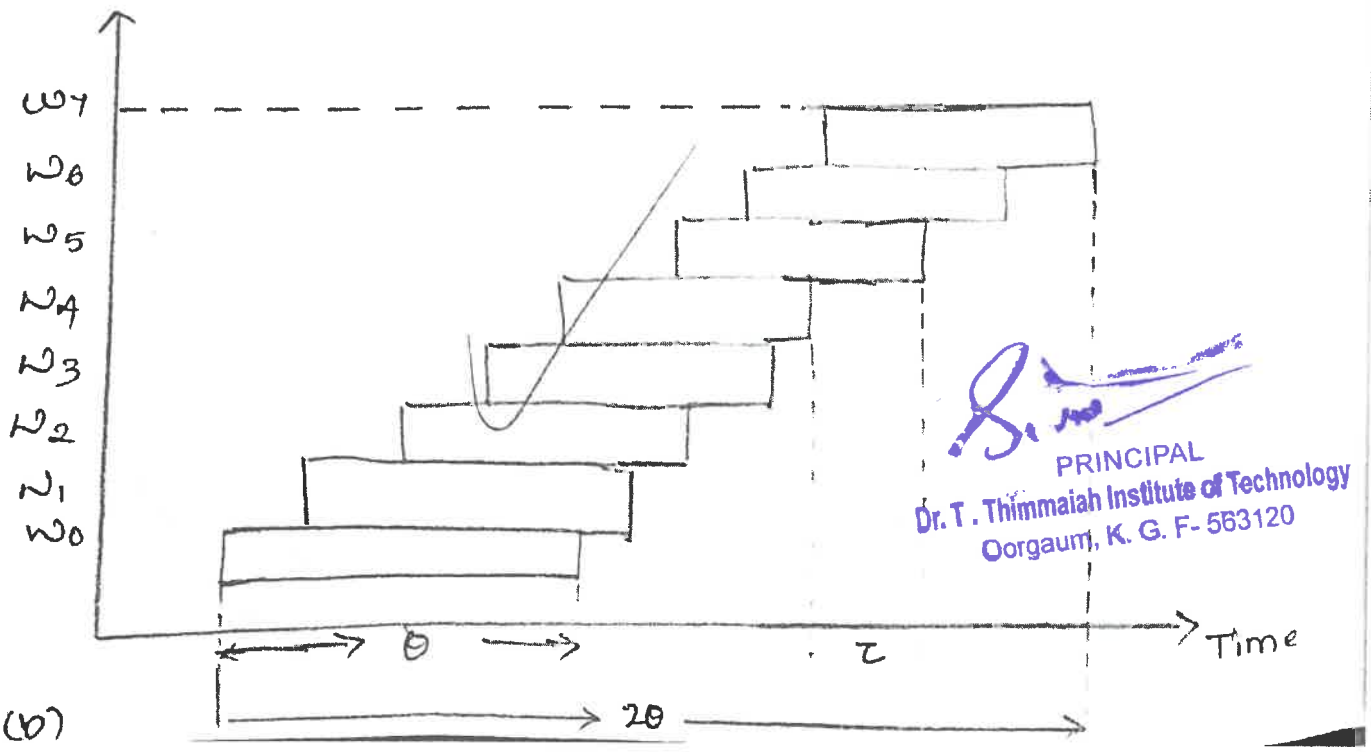
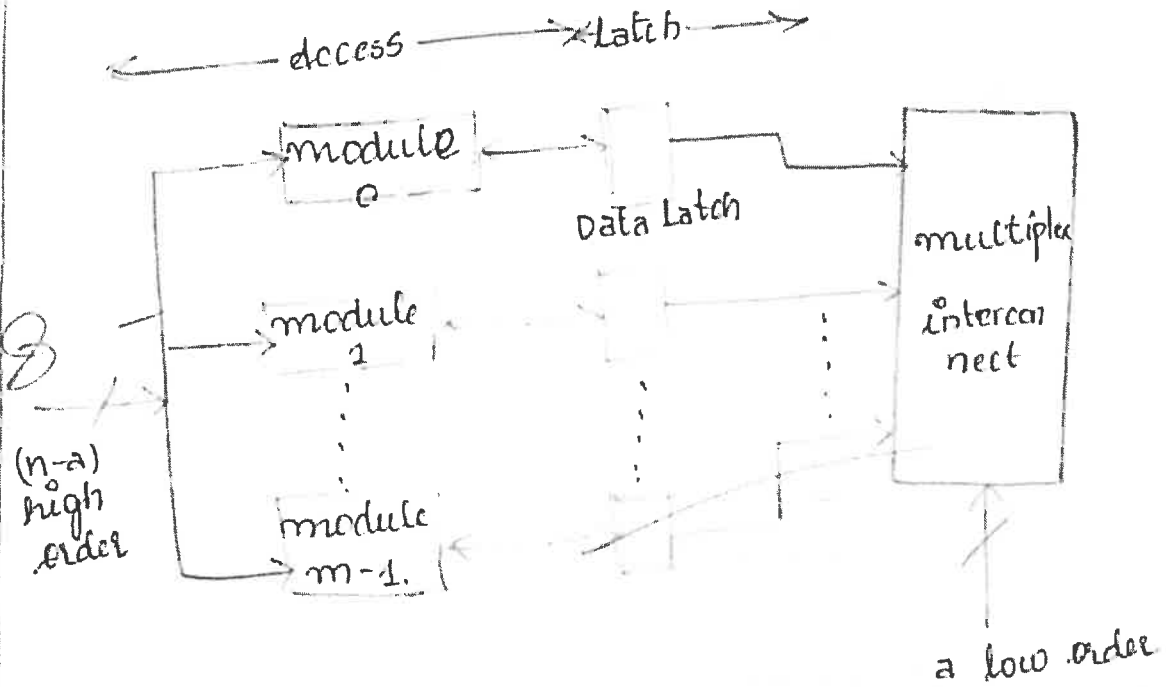


Fig (b)

ii) S - Access memory.

- It access the data simultaneously in synchronized manner.
- The high order bit is (n-a).



iii) c/s memory access.

- It is the combination of both S access memory and C- access memory.
- 'm' is allowed for words of simultaneously from (n-a).

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

PART - B.

3. Different Parallel programming models.

- It is transperent and simple view of computer hardware / software system.
- It is designed for multiprocessors, multicomputers, vectors / SIMD.

There are 5 different types namely:-

1) Variable - sharing model
2) Data - Parallel model
3) Message passing model
4) Functional and Logic model
5) Object Oriented model.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

~~i/p Data - parallel model~~

~~• Fortran~~

i/p Object Oriented model.

→ Concurrent OOP.

- parallel COOP.

ii/p Data - parallel model

- Fortran - 9 is used.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F - 563120

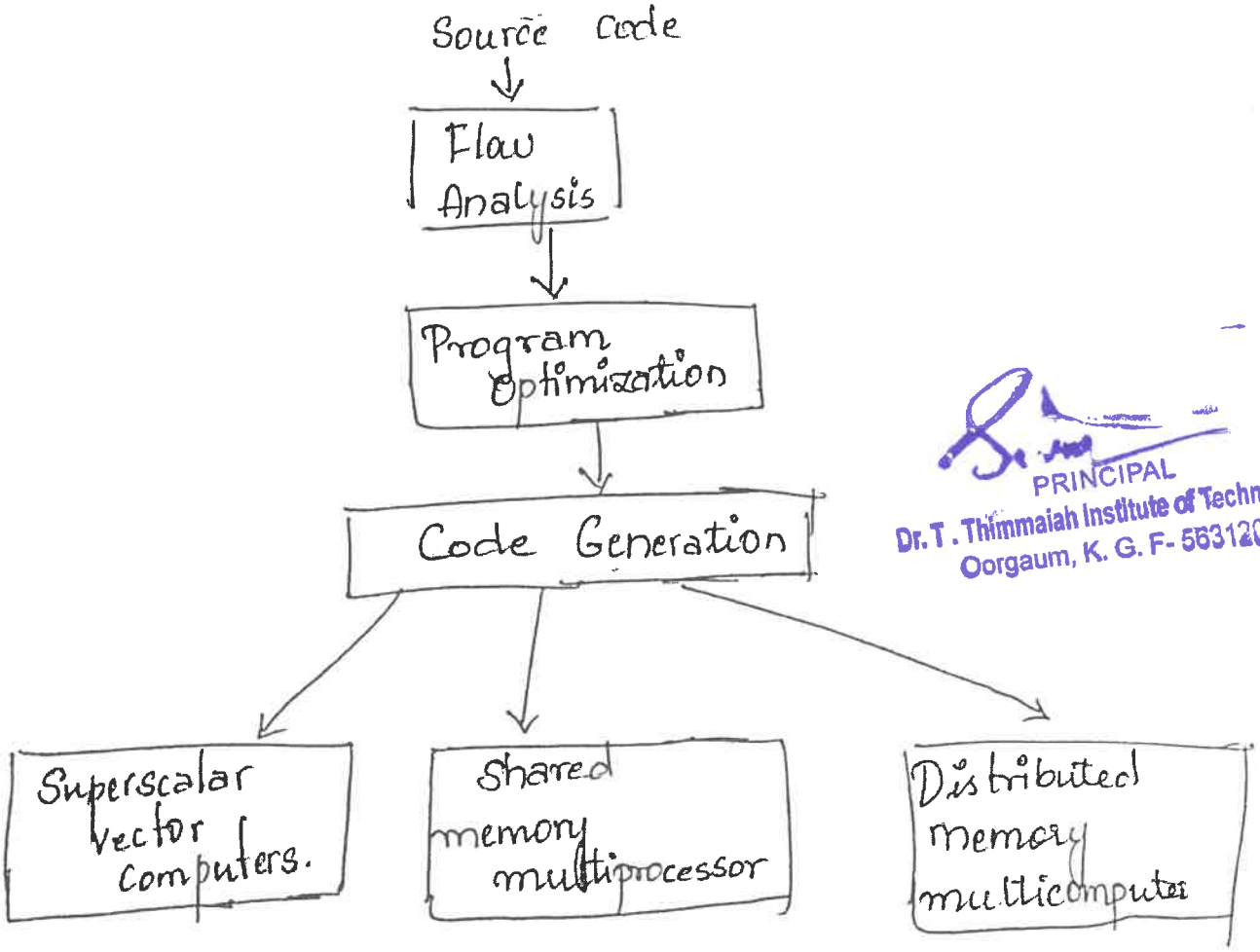
PART - C.

5. Compilation phase in parallel code generation.

It is used to remove optimization and generation burden.

The 3 phases in parallel code are:

1) Flow analysis
2) Optimization
3) Code Generation.



1> Flow Analysis:

- It reveals the flow design. to determine flow and control dependencies.
- The flow occurs in different levels :-

i> instruction level - Superscalar computers
ii> top level - SIMD and systolic computers.
iii> flow level. - multivectors and multicomputers

2> Optimization:

- It reduces code length.
- It is ~~sp~~ seperated from hardware to get synchronized component.
- better performance.
- increases execution speed.

14/11/22
PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

15/30

Golden Valley Educational Trust

Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belgaum)

OORGAUM, K.G.F. - 563 120.

BLUE BOOK

Certificate

This is to certify that Mr. / Ms. ARVIND KUMAR.V

bearing **USN. *No.*** 1GV19MI401 *has satisfactorily completed the course of Tests and assignments as prescribed by Visvesvaraya Technological University for* 6th *Semester B.E./ M.Tech, Degree in* Mining *Branch / Specialization for the academic year* 20-21

for the Subject Mineral processing & fuel tech. *and Code* 18MN63.

For Departmental Use Only :

IA Date	IA	Max Marks	Marks obtained					Signature of Faculty	Signature of Student
			IA (30)	Assign (10)	Quiz (10)	C-Test (10)	Total Marks		
26/05/21	I	40	26.4	–	8	–	34	BPK	
30/6/21	II	40	25.8	10	–	–	36	BPK	
10/8/21	III	40	27.6	10	–	–	37.6	BPK	
Final Average Marks Obtained		(40)					(36)	BPK	

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

Signature of HOD

10/08/2021
Tuesday

III Internal's Assessment Test

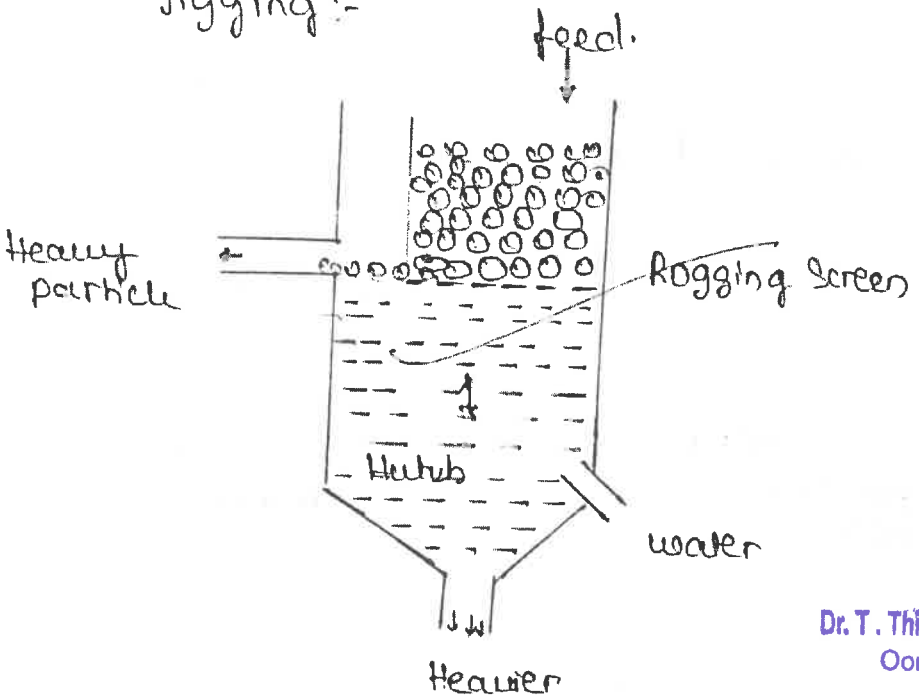
Mineral processing and fuel technology

18MMN63:-

PART-A:-

1.a Answer:-

Jigging:-



PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

→ Jigging It consist of a Rectangular open at the top of the jig and cylinder. The cylinder are circulated water and material particle are feed at the top.

→ Rogging screen which is above the hutch and the water outlet is below the Hutch.

* Jigging is the proces of separating the different particle of specific gravity. The water is made to flow through by pultion and suction stroke.

* Pultion and Suction stroke are given to the screen by means of reciprocating pistion or compressed air

* where jigging Hydraulic jigging consist of water and Pneumatic jigging consist of air

* The two type of jigging screen are ① fixed screen
② moveable screen

moveable screen * Harz screen
* Baum screen

* In jigging proces the feed is at one end and the collection of particle are at two.

① Both concentration and tailing are collected at the jig beds. This method is known as jigging screen.

② Another method the heavier method are collected at the down which the lighter are collected at jig beds.

⇒ In jigging the particle are settling down due to the terminal velocity.

⇒ The seperation of the particle depends on the settleing of particle velocities

⇒ The initial force at the particle is extremely zero and the drag force due to the partical velocities is developed.

⇒ Particles are seperated with two principle they are gravitational force and Beyond force

⇒ force balance equation:-

$$mp = \frac{dv}{dt}(mp - mf)$$

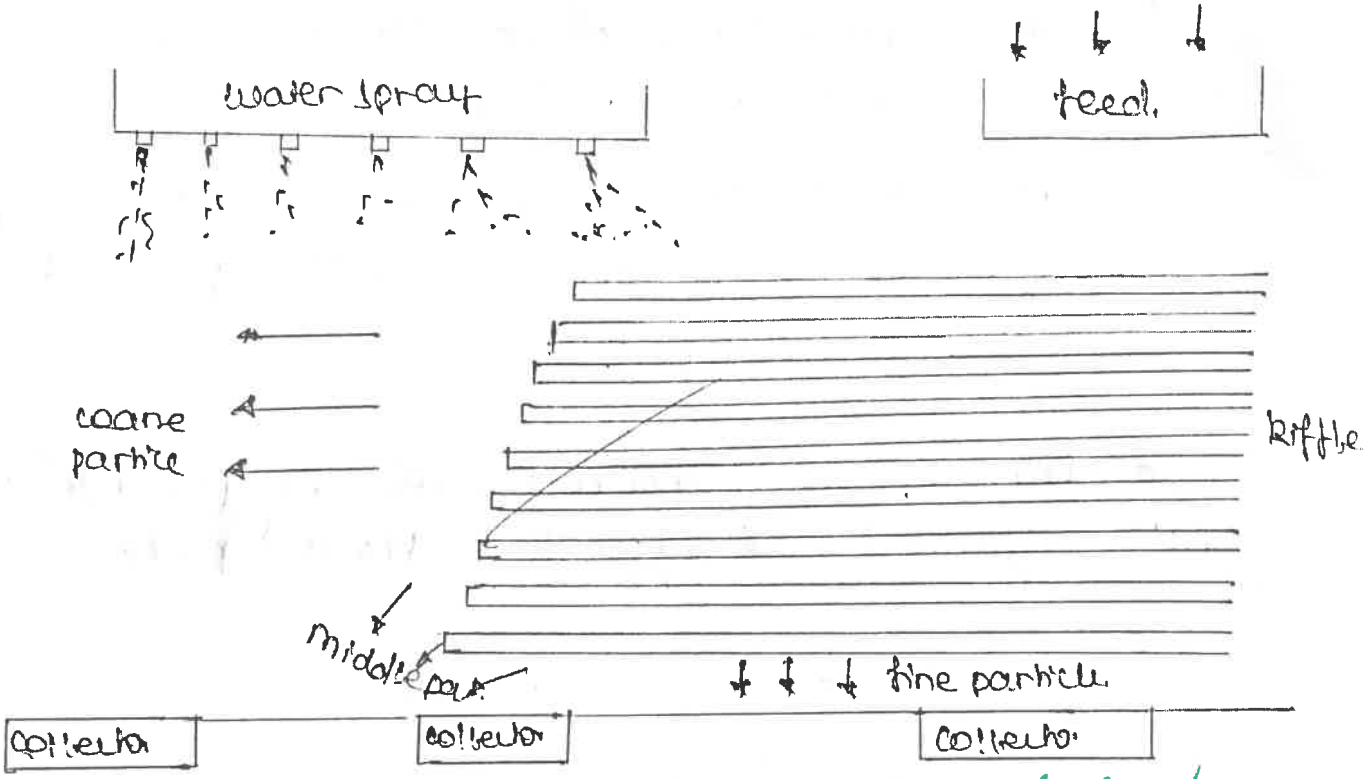
$$\frac{dv}{dt} = \frac{mp - mf}{mp} g = \left(1 - \frac{\rho_f}{\rho_p}\right) g$$

⇒ The settling of particles during the acceleration period.

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

1.b Answer:-

Wilfley / Shaking table.



Shaking table.

* Shaking table consist of water spray, feed particle, Riffle and collector. The slurry feed is drawn out to the table.

* Riffle are the wooden strips which are 1cm width and 1cm height.

* The Riffles are 12 inch and 18 inch varying wooden line on the table, which gap between the Riffle are 1cm.

* The Wilfley table is a Gravity separation which works on the standard wilfley motion.

* The Operating motion to the table which separates the slurry feed according to their size and specific gravity. weight.

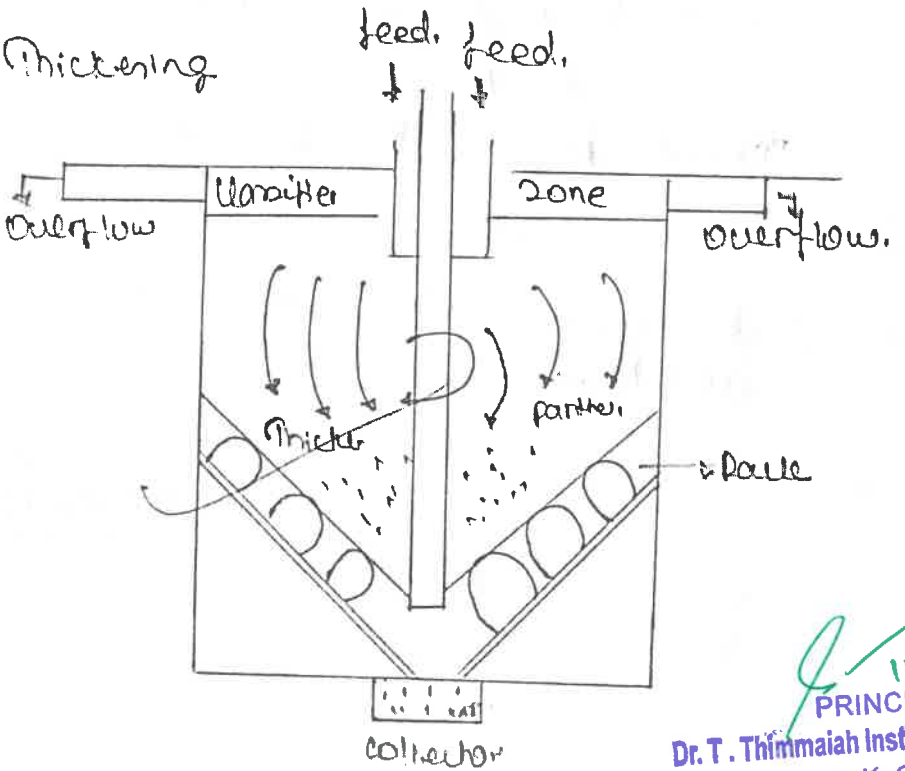
* The low gravity which contain the mineral which keeps at the middle of the riffle lines. and the coarse and medium grain are then concentrated.

* The feed particle are the crushed minerals. allow to run through the table.

× ×

PART-B:-

3a Answer:- Thickening



PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

* Thickening which consist of a plunj rotating and rake of two or more blades. with a big cylindrical construction.

* It's very cheap, Proves more capacity of particle with help of water. It is the specifically used in mineral processing

* when the crushed particles are mixed with the water at continous rotation using plunj & rake the lighter particles are collected at the top and the heavier particle are collected at the bottom.

* The thicker cylinder diameter varies from 2-20m and length of the cylinder will be 1-7m.

* Thickening is the dewatering process where the feed are added at the top via. feed. and the pulp is mixed at surface well to disturbe the particles.

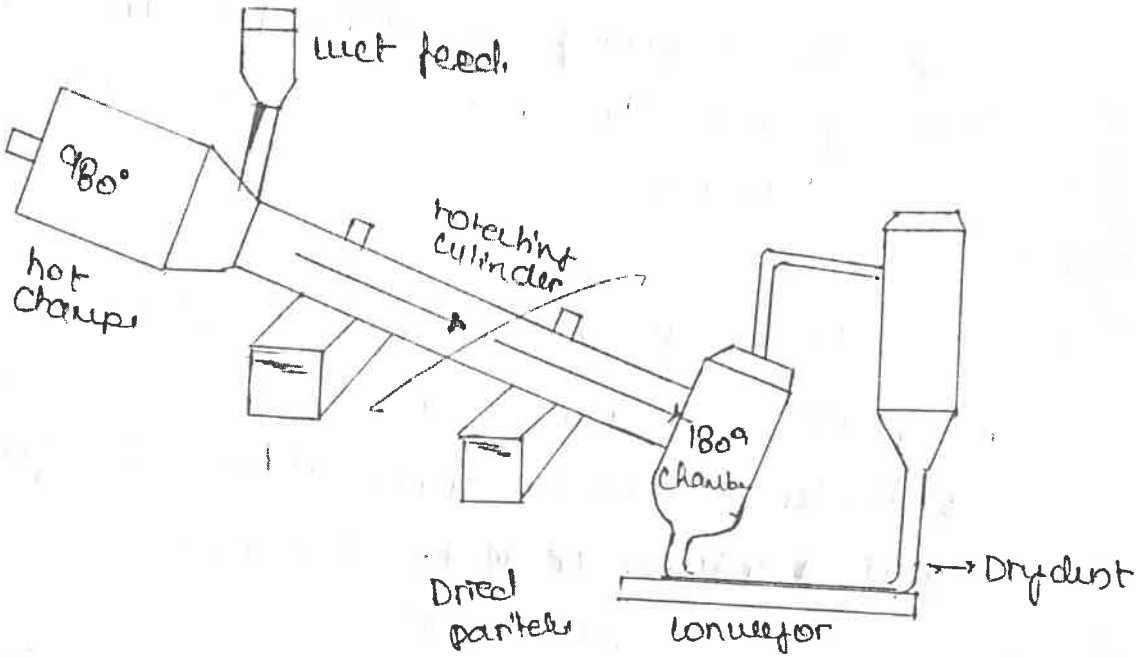
9

*

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

3.b. Answer:-

Drying process.



→ Drying process is the last processing overall in Mineral processing. The material or particle which are collected are about 5% Moisture.

→ It consist of 980° chamber and a rotating cylinder with dust collector connector. to the conveyor system for produced out. and it also has 80° temperature chamber which particle run through.

→ Drying process are of two type Direct and indirect. In Direct process the particle flow through the hot chamber. and in the Indirect

process the temperatured or hot air in shell in the cylinder.

* The moving particles run through its own gravity and the rotation of the cylinder may be also below.

* The cylinder is placed slope or inclined Bea to particle moving with hot gas inlet in the cylinder, should apper abbover the particle with-out moisture, content.

~~The feed material are of wet condition and the feed collector conveyor with~~ material.

The feed material are of wet condition at the via feed the hot gas chamber makes the material to absorb the moisture and dry condition.

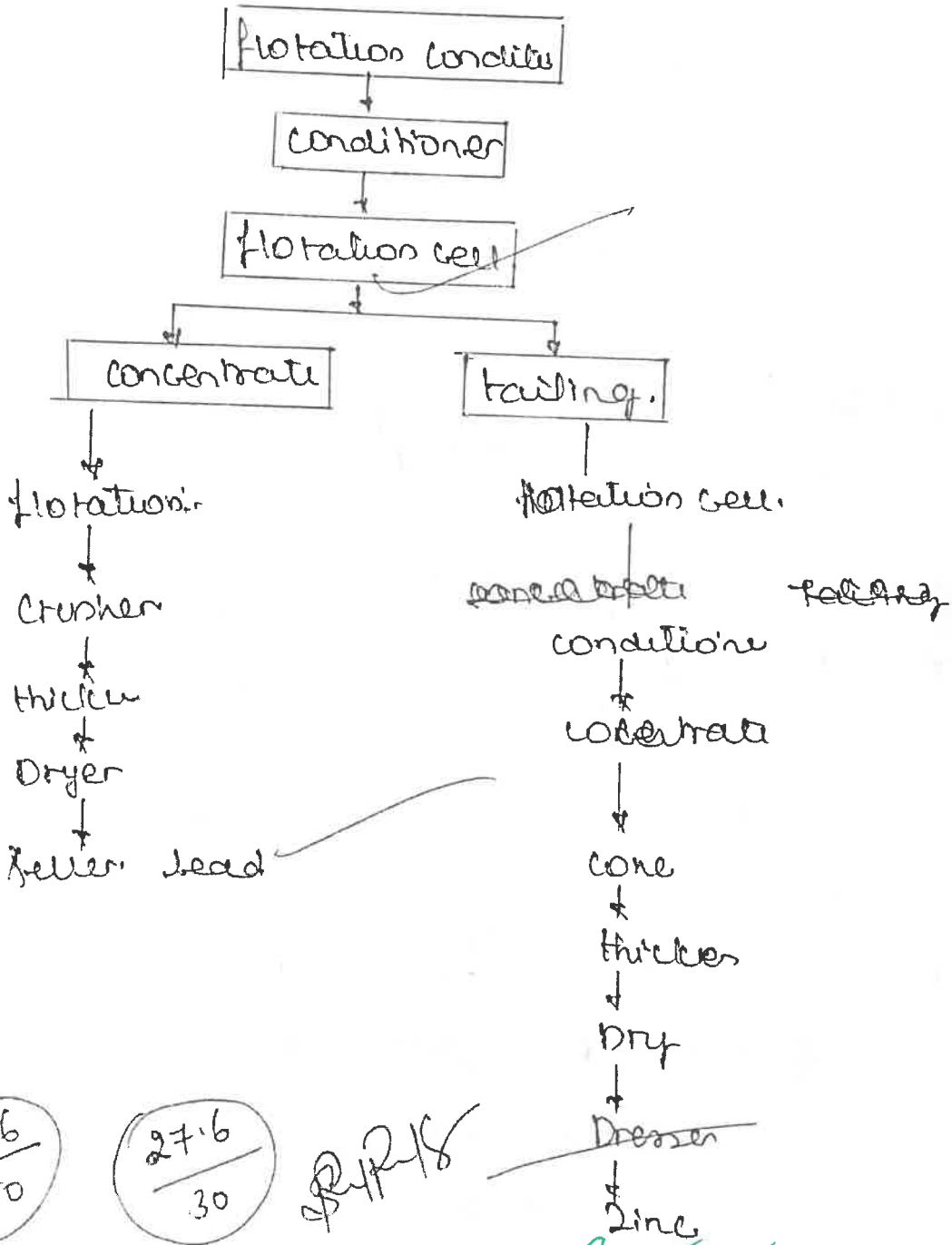
10

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120

PART - C

05. Answer.

lead.



8

46/50

27.6/30

PRINCIPAL
Dr. T. Thimmaiah Institute of Technology
Oorgaum, K. G. F- 563120