

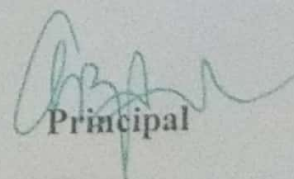
# JCT COLLEGE OF ENGINEERING AND TECHNOLOGY

PICHANUR, COIMBATORE – 641 105

## SUMMARY SHEET

### 2.5. Evaluation Process and Reforms

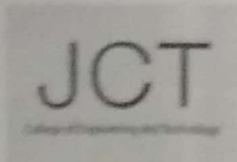
S.NO	CRITERIA	PAGE NO
1	2.5.1 Reforms in Continuous Internal Evaluation (CIE) System at the Institutional level	1
2	2.5.2 Mechanism of internal assessment is transparent and robust in terms of frequency and variety	26
3	2.5.3 Mechanism to deal with examination related grievances is transparent, time- bound and efficient	53
4	2.5.4 The Institution adheres to the academic calendar for the conduct of CIE	77



Principal

Dr. G. Ramesh, M.E., Ph.D.,  
PRINCIPAL

JCT College of Engineering and Technology  
Pichanur, Coimbatore - 641 105



JCT COLLEGE OF ENGINEERING AND TECHNOLOGY



Department of Petroleum Engineering

Pichanur, Coimbatore - 641105

CIRCULAR

Ref: Cir1/HoD/PE/2/2019

27.02.2019

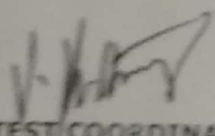
**Sub: Third Internal Test - Reg.**

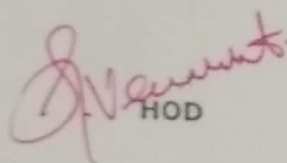
This is to inform that Internal Test - III is scheduled from **04.03.19** to **06.03.19** (11:00 am to 12:30 pm and 02:30 pm to 04:00 pm). All the students should attend the test compulsorily. (To be read in the class room)

For Faculty:

The Faculty members are asked to set the question paper with answer key for 4 units and get the sign from HOD then submit the question paper to the Department Exam cell on or before 01.03.19 by 1.00 pm.

Class advisors are requested to submit the result analysis for the CIA-III on or before 09.03.2019.

  
TEST COORDINATOR

  
HOD

Circulation to:

- > Faculty members through HOD
- > NBs(Test - II Schedule)
- > II, III, IV year students through HODs (To be read in the class room)



## JCT COLLEGE OF ENGINEERING AND TECHNOLOGY Pichanur, Coimbatore - 641105

### INTERNAL TEST- III TIME TABLE

ACADEMIC YEAR: 2018 - 2019 (ODD SEMESTER)

YEAR: II / III / IV

SEM: IV / VI / VIII



DATE YEAR	04.03.19 (11.00 am to 12.30 pm) FN	04.03.19 (02.45 pm to 04.15 pm) AN	05.03.19 (11.00 am to 12.30 pm) FN	05.03.19 (02.45 pm to 04.15 pm) AN	06.03.19 (11.00 am to 12.30 pm) FN	06.03.19 (02.45 pm to 04.15 pm) AN
II PE	PE8491 CET	PE8401 GP	CY8292 CT	PE8402 FPG	PE8403 HSEM	CH8591 HT
III PE	PE6601 RCM	PE6602 PPE	PE6603 WCTW	PE6604 PC&I	PE6605 PRP	PE6606 NGE
IV PE	PE6801 RASE	PE6004 MGM	PE6010 WCS	-	-	-

TEST COORDINATOR

HOD



**JCT COLLEGE OF ENGINEERING AND TECHNOLOGY,**  
**PICHANUR, COIMBATORE - 641105**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**  
**DUTY ALLOCATION LIST FOR FACULTY**



**INTERNAL EXAM - III**

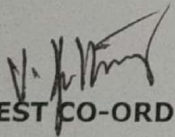
**SEM : EVEN SEMESTER**

**ACADAMIC YEAR : 2018-19**

S.N o.	NAME OF THE FACULTY / DATE	04.03.19 (FN)	04.03.19 (AN)	05.03.19 (FN)	05.03.19 (AN)	06.03.19 (FN)	06.03.19 (AN)
1	G.Balachandran			D		D	
2	Mr.G.Mahendran		D		D	D	
3	Mr.S.Jenish	D		D	D		
4	Mr.N.Aravindh		D				D
5	V.Purushothaman		D				D
6	Arun Ammaiappan A	D		D		D	
7	Shabil John J P				D		D
8	Gengadevi R				D		
9	Bharathiraja P	D					
11	K Jayajothi		D				
12	G Sarojini					D	
13	Thahseen			D			
14	A.Kousalaya	D					

**\*\* All the invigilators are requested to report the invigilation duty by 10.50 am and 2.40 pm in the Department examination section without fail.**

**\*\* HOD are requested to ensure that the altered duty by their faculty before sanctioning the leave .**

  
**TEST CO-ORDINATOR**

  
**HOD**

CIRCULATION TO :  
 FACULTY THROUGH HOD



JCT COLLEGE OF ENGR. & TECH, WIMBORNE  
Department of Petroleum Engrg.

II-YEAR, IV- SEM CIA-IV ATTENDANCE SHEET

S.NO	REG NO	SUBJECT NAME NAME	04.03.19 FN AN	04.03.19 AN	05.03.19 FN AN	05.03.19 AN	06.2.19 FN	06.2.19 AN
1	720917219001	ADARSH CHANDRAN	AD	AB	AB	AB		
2	720917219002	ADHIDEV KRISHNA P J	AB	AB	AB	AB		
3	720917219003	AISWARYA B	B. Aing	B. Aing	B. Aing	B. Aing	B. Aing	
4	720917219004	AJAY S M	Ajay	AB	Ajay	AB	Ajay	
5	720917219005	AJAY C SURESH	Ajay	AB	Ajay	AB	Ajay	
6	720917219006	AKILESH K	AKL	AB	AKL	AKL	AKL	
7	720917219007	AMRITHA N KRISHNA	Amritha	Amritha	Amritha	Amritha	Amritha	
8	720917219008	ANAND M.V	AB	AB	AB	AB		
9	720917219010	ARUN CHAND	AB	AB	AB	AB		
10	720917219011	ASHIN.S.S	AB	AB	AB	AB	AB	
11	720917219012	ASHOK KUMAR V	AB	AB	AB	AB	AB	
12	720917219013	BRIGHTON BALAN.J	AB	AB	AB	AB		
13	720917219014	DHANUSH.P	P.DT	AB	P.DT	P.DT	P.DT	
14	720917219015	DHINESHKUMAR G	AB	AB	AB	AB		
15	720917219016	DHIVAKAR.S	Dhivakar	Dhivakar	Dhivakar	Dhivakar	Dhivakar	
16	720917219017	DIBISH.J	Dibish	AB	Dibish	Dibish	Dibish	
17	720917219019	ESAKKI SELVAM.M	ESAKKI	ESAKKI	ESAKKI	ESAKKI	ESAKKI	
18	720917219020	GNANASEKARAN.S	Gnanasekaran	Gnanasekaran	AB	AB		
19	720917219022	HARIKRISHNAN.V	AB	AB	AB	AB		
20	720917219023	HARIKRISHNAN.N.VIN OD	AB	AB	AB	AB		
21	720917219024	HRITHIK PRAKASAN	HRITHIK	HRITHIK	HRITHIK	HRITHIK	HRITHIK	
22	720917219025	JUTEN PETER LEON	AB	AB	AB	AB		
23	720917219026	KANNAN.V.S	AB	AB	AB	AB		
24	720917219027	KAVIYARASU.M	Kaviyarasu	Kaviyarasu	Kaviyarasu	Kaviyarasu	Kaviyarasu	
25	720917219028	KISHORE C	Kishore	AB	Kishore	AB	Kishore	
26	720917219029	LAVANYA B	Lavanya	Lavanya	Lavanya	Lavanya	Lavanya	
27	720917219030	LIBIN JOSEPH	AB	AB	AB	AB		



**JCT**

**JCT COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**PICHANUR, COIMBATORE-641105**  
**DEPARTMENT OF PETROLEUM ENGINEERING**



Exam Date / Session : 25/01/2019	Duration : 90 Minutes
Examination : CIA-I	Department : PE
Course Title : NATURAL GAS ENGINEERING	Course Code : PE6606
Year / Sem : III/VI	Maximum Marks : 50
Academic year : 2018-2019	Semester Type : EVEN

**COURSE OUTCOMES:**

1 C315

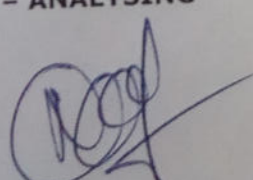
**ANSWER ALL QUESTIONS**

No	Course Outcomes	Bloom Taxonomy	Questions	Marks
1	C315.1	R	Explain about sedimentation process.	2
2	C315.1	R	List the various sources of information for natural gas and its application.	2
3	C315.1	U	Define historical geology.	2
4	C315.1	R	What are the various applications of natural gas.	2
5	C315.1	U	Define petroleum reservoir.	2
<b>PART-B</b>				
6	C315.1	R	Briefly explain about the various branches of petroleum industry.	10
7	C315.1	R	Explain about the various theories describing the origin of petroleum.	10
8	C315.1	U	Difference between natural gas, compressed natural gas, Liquefied natural gas and liquefied petroleum gas.	10
9	C315.1	U	How earth temperature and earth pressure influenced the oil and gas production with example.	10

R- REMEMBERING  
AN - ANALYSING

U - UNDERSTANDING  
E- EVALUATING

AP- APPLYING  
C - CREATING

  
**COURSEINCHARGEHOD**

Natural Gas EngineeringPetroleum Reservoir

Petroleum Reservoir is an other wise known as oil & gas reservoir. The petroleum Reservoir is a study of oil & gas from subsurface & production or unable to ~~reach~~ daily life were called petroleum Reservoir.

The Subsidence of oil & gas exploration for bottom hole to top hole exploration were called petroleum Reservoir.

Various application of Natural Gas

The Natural Gas were impled in several way of human life. They were.

1. mainly used for LPG, LNG System.
2. mainly gather for hospital & other industrial Confirmed.

Sediment process

The Sediment process were called, the Soil or other particle that Sediments by the force of help that water & air & other consumption.



## Various branches of petroleum Industry:

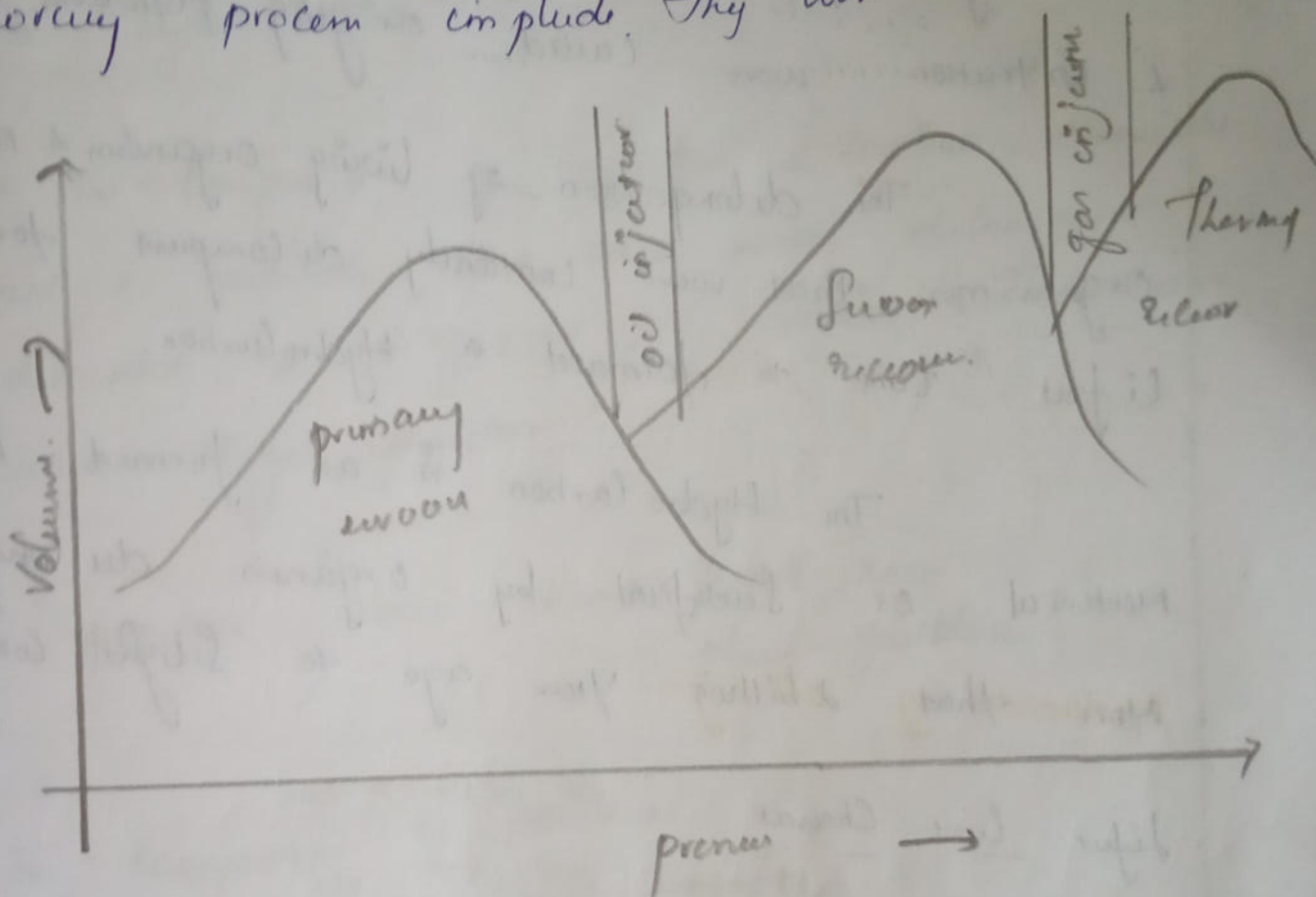
In a reservoir that petroleum industry have several type of problem to handle the same attained. They were.

1. Surveying a Land Surface.
2. Confirming the Geologist
3. Confirming the Source of hydrocarbon.
4. Study the Land Surface of reservoir portion.
5. Cost were estimated for the development for Hydrocarbon.
6. Exploration of Hydrocarbon Sample Collection
7. Reservoir Simulation handle.
8. Stimulation of wave arrangement for blow the Seismic waves.
9. Well Completion & working system for the reservoir process.
10. Secondary, primary oil recovery process.
11. Enhanced oil formation recovery.
12. Refining Calibration Separation.



## Oil recovery process

In an petroleum production is continuously calculated the life time after reduced the production to recovery process include. They are:



### Type of petroleum oil recovery

1. primary oil recovery.
2. Secondary oil recovery
3. Thermal oil recovery.

The primary oil recovery that required by the oil injection

The Secondary oil recovery that required by the gas injection.

## 8. Natural gas

The origin of natural gas is an  
of mixed gas. Mixture of hydrocarbon,  
or other gas composition & mainly composition. It's  
methane, &  $CO_2$  are source of natural gas.

Composition of Natural gas.

The composition of natural gas was  
Several percentage.

Carbon - 83 - 87%.

Hydrogen - 12 to 14%.

Methane - 1.25 %.

Ethane - 0.68 %.

$CO_2$  - 0.028 %.

Propane - 0.05 to 0.28 %.

Composition of Natural gas

Influence of natural gas that  
methane, ethane &  $CO_2$ , oxygen were  
of natural gas. They were mainly used to  
petroleum & natural gas.



Combustion  
mix  
of  
gas

Liquefied petroleum gas. It's carbon & odourless gas formation.	Liquefied natural gas. It's an carbon & odourless gas formation.
It's an very highly density	It's an very medium density
The pressure level was high when compare at other gas	The pressure level were also high when compare of composition
Combine of methane, ethane, propane & other gas to form.	Combine of CO <sub>2</sub> , oxygen, and inert gas & etc.
used for: cooking, heating, vehicle.	used for: Motor cycle to calibration.

### 9. Earth's temperature

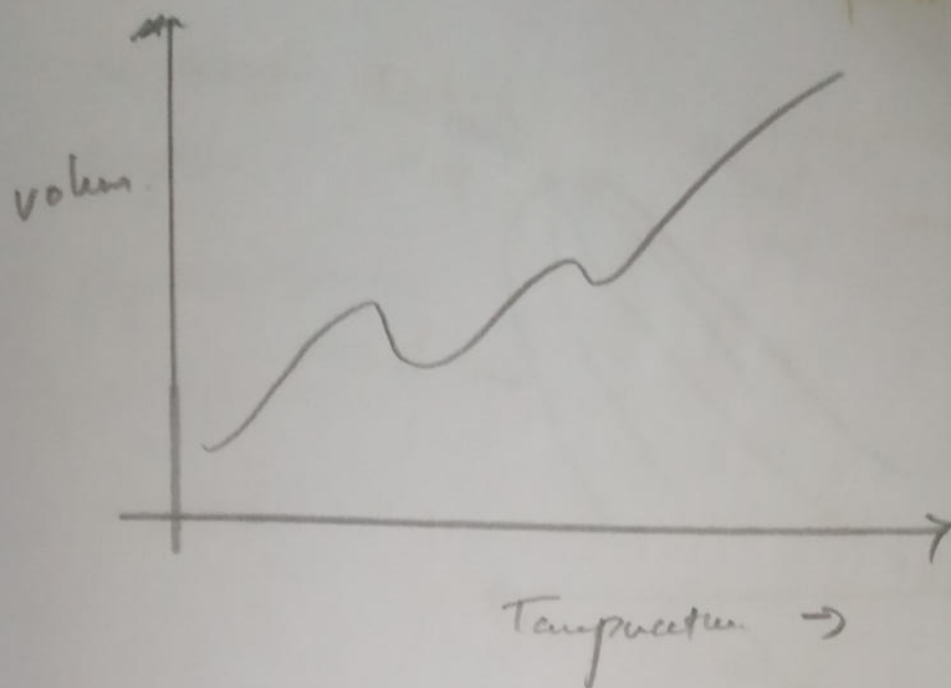
By the crust & mantle portion there has

temperature North a 27° to 37°C

Temperature South a 35 to 41°C

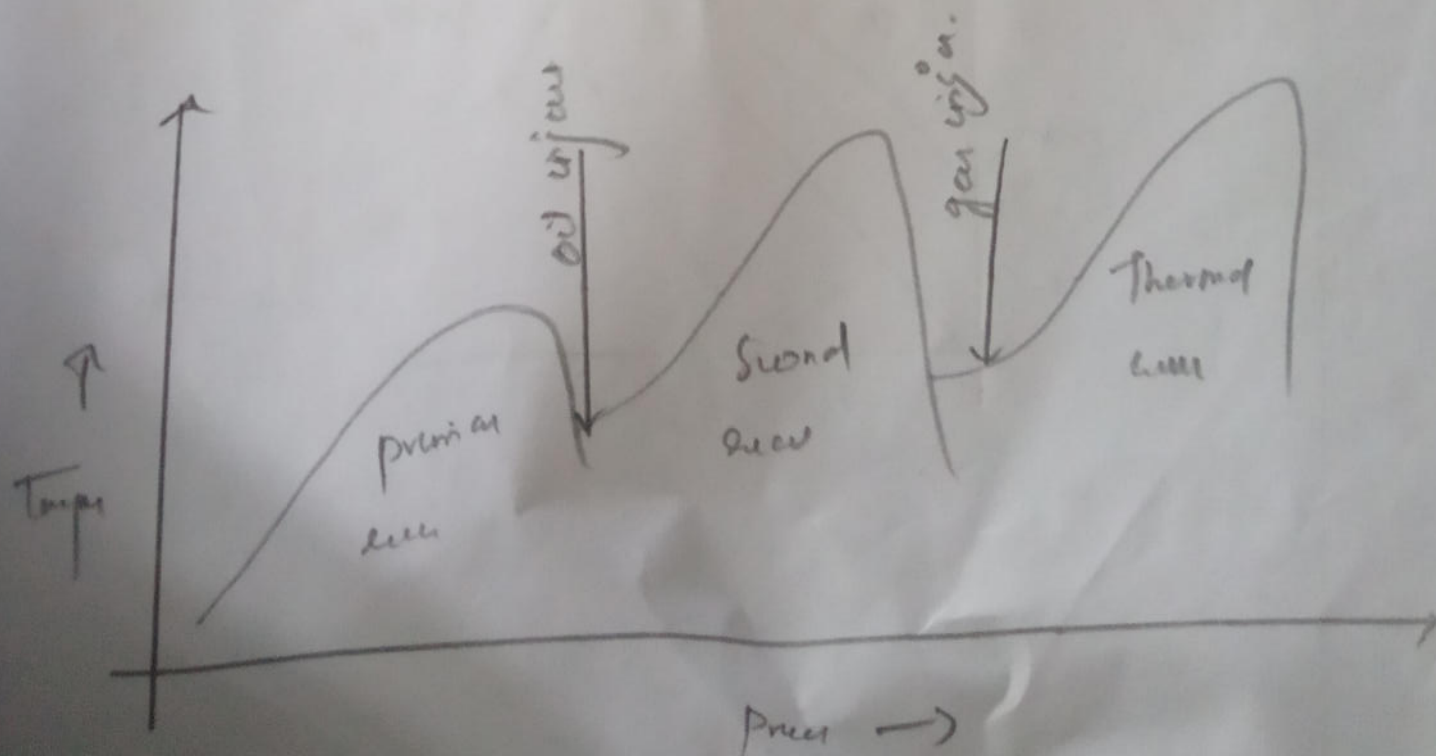
Temperature East at 15 to 27°C

# Temperature



oil & gas production below.

1. Primary recovery
2. Secondary recovery
3. Thermal recovery





## Glycol / amine process:

It is the components having

45 - 85% of Glycol Amine

5 - 25% of water

10 - 30% of Glycol.

### Advantages:

It is the combination of dehydration and composition of the amine feeds.

### Disadvantages:

It is the <sup>need</sup> having high foaming and utility process.

## Sulfinol process:-

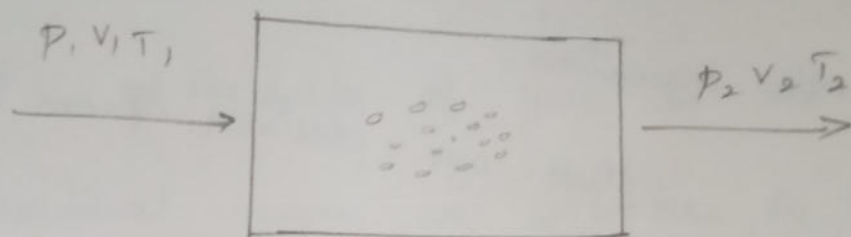
It has the basic components of Sulphinol and ~~Diisopropylamine~~ (DIPA)

### Advantages:

high foaming

high utility

low pressure performance.



At constant  $P$ ,  $T_1 \rightarrow T_2$   $V_1 \rightarrow V'$

At constant  $T$ ,  $P_1 \rightarrow P_2$   $V' \rightarrow T_2$

By the gas laws,  
assumption.

i) molecular wt is negligible infinitely small.

ii) Ideal gas laws. behaviours.

$$P_1 V_1 = P_2 V_2$$

$$V' = \frac{T_2 V_2}{T_1}$$

$$\frac{P_1 V'}{T_1} = \frac{P_2 V_2}{T_2} \Rightarrow \frac{P}{T} = R$$

$\Downarrow$

$$\frac{PV}{T} = R$$



6.

## Gas hydrates:-

\* Hydrates of gas in the formations of natural gas is similar to that of the petroleum.

\* By the gas hydrates of natural gas hydrates it may varies with the normal basic components.

## Types of gas hydrates:-

\* Ethane

\* Methane

\* Carbon-dioxide

\* Hydrogen sulphide.

## Ethane gas hydrates:-

It is the base of all and common of all in the hydrates.

Types of condensate stabilization.

- i) flash vaporization
- ii) Glycol vaporization

Gas sweetening process:

Removal of sour gas or acidic gas/solution from the natural gas is called gas sweetening process.

Various composition of natural gas:

Methane and higher alkanes.

$H_2S$ , Nitrogen, and  $CO_2$ .

Gathering lines:

which is used to connect the other targets.

Transition lines:

The connection of two targets is the transition lines.



5. Glycol / amine process

It is one of the acid treating process.

↑  
components

10 - 30% of Glycol

45 - 85% of Amine

5 - 25% of water.

It is a combination of both dehydration and hydrate process.

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**JCT COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**PICHANUR, COIMBATORE-641105**  
**DEPARTMENT OF PETROLEUM ENGINEERING**



Exam Date / Session : 19 / 02 / 2019

Examination : CIA-III

Duration : 90 Minutes

Course Title : NATURAL GAS ENGINEERING

Department : PE

Sem / Sem : III / VI

Course Code : PE6606

Academic year : 2018-2019

Maximum Marks : 50

COURSE OUTCOMES:

Semester Type : EVEN

3 C315

**ANSWER ALL QUESTIONS**

No	Course Outcomes	Bloom Taxonomy	Questions	Marks
1	C315.3	R	Define natural gas compression	2
2	C315.3	R	What are the advantages of gas compression	2
3	C315.3	U	What is meant by positive displacement compressor.	2
4	C315.3	R	Define variable density flow	2
5	C315.3	U	What are the factor to be consider while selecting a compressor.	2
<b>PART-B</b>				
6	C315.3	R	What are the different types of compressor? Briefly explain about centrifugal compressor with neat diagram.	10
7	C315.3	R	Derive the general equation to calculate the power requirement	10
8	C315.3	U	Derive the general equation for compressible flow in pipes.	10
9	C315.3	U	Derive fundamental equation of flow of fluid dynamics (Continuity, Momentum and energy equations)	10

R- REMEMBERING

U - UNDERSTANDING

AP- APPLYING

AN - ANALYSING

E- EVALUATING

C - CREATING

COURSE INCHARGE

HOD



16/50

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Padideem Engineering - 11/24

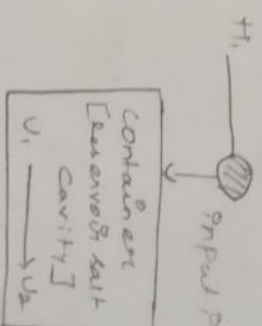
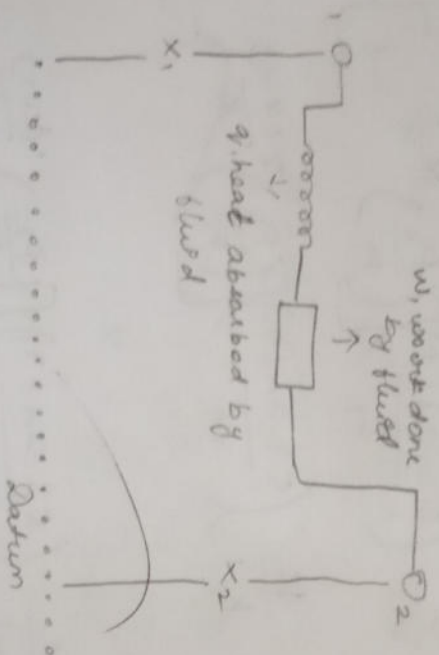
Natural Gas Engineering

19. 2. 2019.

CIPA-3.

Part-B

2. GENERAL EQUATION TO CALCULATE POWER REQUIREMENT



a) Steady State

$$u_2 + \frac{m}{2gc} \frac{v_2^2}{2gc} + p_2 v_2 + \frac{m}{2gc} \frac{q}{2gc} x_2 - \left( u_1 + \frac{m}{2gc} \frac{v_1^2}{2gc} + p_1 v_1 + \frac{m}{2gc} \frac{q}{2gc} x_1 \right) =$$

b) Unsteady State

$$Q + (-u_2)$$

→ ①

Equation ① ÷ by m

$$u_2 + \frac{v_2^2}{2gc} + p_2 v_2 + \frac{q}{gc} x_2 - \left( u_1 + \frac{v_1^2}{2gc} + p_1 v_1 + \frac{q}{gc} x_1 \right) = q + (-u_2)$$

→ ②

4 to use Bernoulli's  $\rho = 2.6 \times 10^{-5} \frac{\text{kg}}{\text{cm}^3}$  &  $\frac{h}{4\pi m} \approx \frac{h}{4\pi m} \left( \frac{h}{4\pi m} \right)^2 \frac{h}{4\pi m} \approx \frac{h}{4\pi m} \frac{h}{4\pi m} \frac{h}{4\pi m}$

$\left[ 41 \text{ ft} \approx 0.4 \text{ m} \approx \Delta x \right]$

Compressible is fluid in pipes.

$\mu = \frac{1}{\rho} \frac{d\rho}{dP} \rightarrow \text{⑦}$

$\mu_T = \frac{1}{\rho} \left( \frac{d\rho}{dP} \right)_T \rightarrow \text{⑧}$

$\left( \frac{d\rho}{dP} \right)_T \rightarrow \text{⑨}$

$\mu = \frac{1}{\rho} \frac{d\rho}{dP} \rightarrow \text{⑩}$

$d\rho = \rho \cdot \mu dP \rightarrow \text{⑪}$

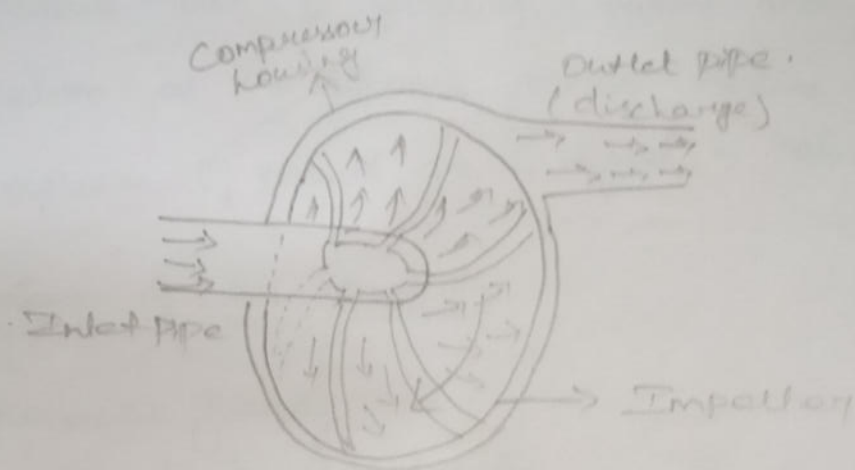
$\omega^2 \sim \left[ \frac{\rho_1 \rho_2}{\rho_1 + \rho_2} \right] \left[ \frac{\rho_1 - \rho_2}{\rho_1} \right] \rightarrow \text{⑫}$

$P_1^0 - P_2^0 = 2 \mu \rho_T \left( \frac{\mu}{\rho} \right)^0 \left( \frac{E}{\rho} + 0.6 \rho \frac{P}{\rho} \right)$

Above equation are standard developed based on the following assumption:  
1) flow is isothermal.



\* It is used for pumping the fluid at high pressure to a certain stage.



\* It is used for rotating the fluid at a high speed from one place to another place.

\* The flow is inside the compressor housing which flows towards the impeller to the discharging tube.

\* The fluid first enters into the inlet pipe and then enters into the impeller to the flow faster to the outlet pipe.

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**PICHANUR, COIMBATORE-641105**  
**DEPARTMENT OF PETROLEUM ENGINEERING**

**TÜV**

AUSTRIA

CERTIFIED

FOR QUALITY MANAGEMENT SYSTEMS

Exam Date / Session : 05/02/2019

Duration : 90 Minutes

Examination : CIA-II

Department : PE

Course Title : NATURAL GAS ENGINEERING

Course Code : PE6606

Year / Sem : III/VI

Academic year : 2018-2019

Maximum Marks : 50

COURSE OUTCOMES:

Semester Type : EVEN

2

C315

**ANSWER ALL QUESTIONS**

S.No	Course Outcomes	Bloom Taxonomy	Questions	Marks
1	C315.2	R	Explain about gathering lines and transition lines.	2
2	C315.2	R	List the types of condensate stabilization.	2
3	C315.2	U	Define gas sweetening process.	2
4	C315.2	R	Explain the various compositions of natural gas	2
5	C315.2	U	Explain glycol amine process.	2

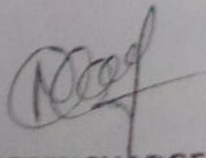
**PART-B**

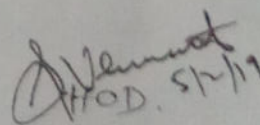
6	C315.2	R	Briefly explain about gas hydrates and its types. Also explain about the hydrate formation condition and hydrate preventing methods.	10
7	C315.2	R	Explain about Condensate stabilization and its types. Briefly explain about flash vaporization process.	10
8	C315.2	U	Briefly explain about Acid gas treatment process and its types	10
9	C315.2	U	Derive general equation of state for an cubic equation.	10

R- REMEMBERING  
 AN - ANALYSING

U - UNDERSTANDING  
 E- EVALUATING

AP- APPLYING  
 C - CREATING

  
 COURSEINCHARGE

  
 HOD. 5/2/19



# Flash Vaporization:

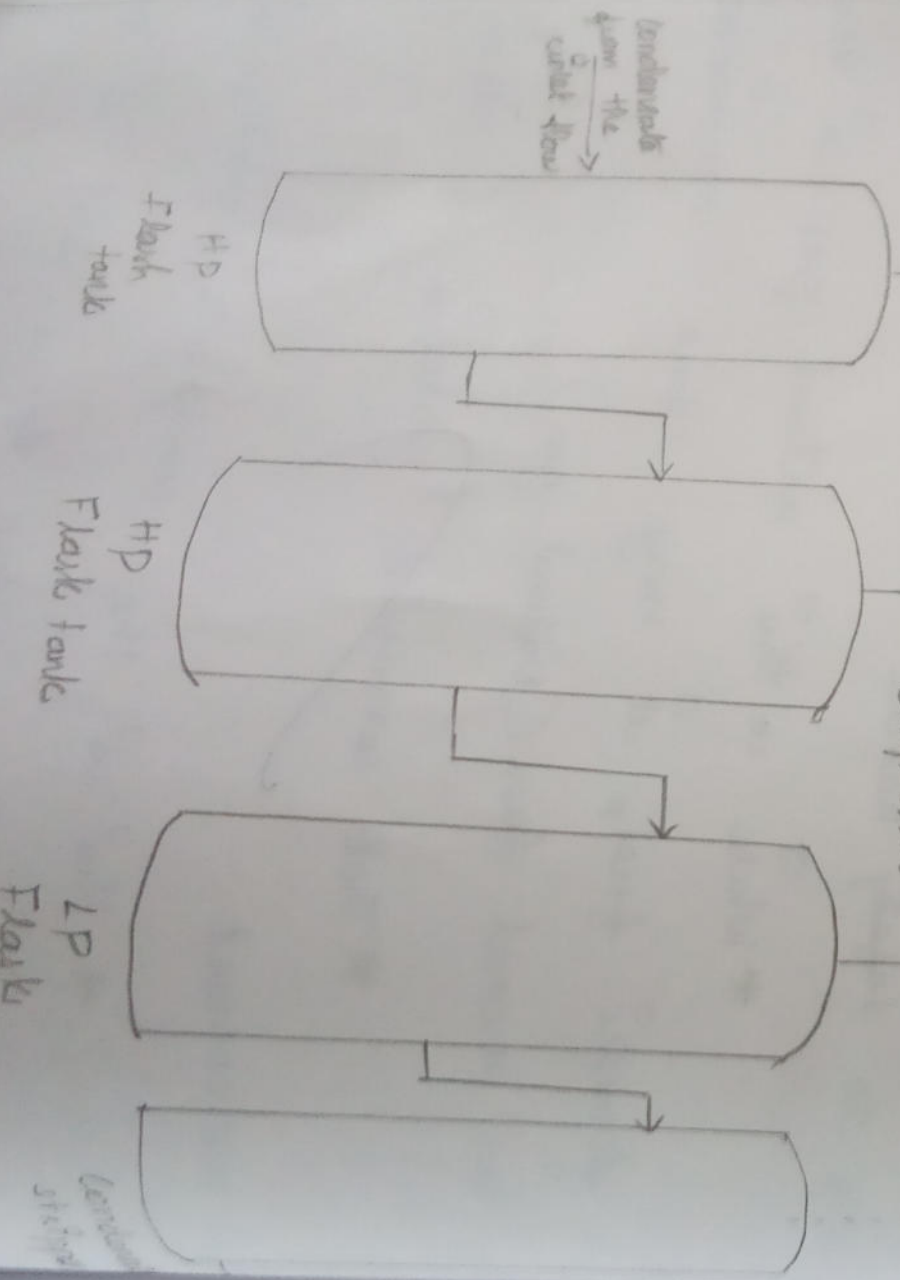
It is the main type of vaporization.

Stabilization of condensate from natural gas, (ie) is called flash vaporization.

in batch separation process.

Diagram:-

Flash sweetening  
all gas systems  
compressor  
To a low



Flash Vaporization.

\* First of all, the feed of the flash & vaporization is the condensate from the inlet flow.

\* that is feed into the HP flash tank which contains flash sweetening agent and a compressor at the top of the tank.

\* The rest of the feed is to the 2<sup>nd</sup> HP flash tank at a high pressure full gas systems with a compressor that are also connected to the next low pressure flash tanks.

\* The LP flash tank is connected to the previous HP flash tank that is by the compressor.

\* The remaining feed is to a stripper which absorbs most that at low pressure full gas system.

\* After that, that is stored in a

Storage tank.



## 8. Acid gas treatment:-

\*  $H_2S$  and  $CO_2$  is present in natural gas (i.e.) is called Acid gas. Acidic solution in the presence of water.

\* It is a "poisonous gas".

\* If it is used as a domestic fuel,

it may cause severe problems and may

\* While using natural gas as

domestic fuel, it may check that it

is free from  $H_2S$  or  $CO_2$  combine with  $H_2O$

## Types of Acid gas treatment:-

There are 4 types,

\* Iron - sponge sweetening

\* Alkanolamine sweetening

\* Glycol/amine process

\* Sulfino! process