



**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
END TERM EXAMINATION - JAN 2023**

Semester : Semester V - 2020

Course Code : PET2017

Course Name : Sem V - PET2017 - Natural Gas Hydrates

Program : B.Tech. Petroleum Engineering

Date : 13-JAN-2023

Time : 9.30AM - 12.30PM

Max Marks : 100

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.

PART A

ANSWER ALL THE TEN QUESTIONS

10 X 2 = 20M

1. _____ et al. (1983) indicated that the E rings of Saturn were_____.
(CO1) [Knowledge]
2. The gas hydrate formation occurs more in the system. Describe the system consider as a closed pressure vessel or chamber.
(CO2) [Knowledge]
3. Label the formation area of hydrates. List out the stages of hydrate formation that are involved.
(CO1) [Knowledge]
4. Describe the observations made during hydrate nucleation.
(CO2) [Knowledge]
5. State Gay-Lussac's Law.
(CO3) [Knowledge]
6. Define CCUS.
(CO4) [Knowledge]
7. Define kinetics of hydrate.
(CO3) [Knowledge]
8. State the desalination process for gas hydrate application.
(CO4) [Knowledge]
9. _____era is known as man-made hydrates. State the reason.
(CO1) [Knowledge]
10. Write any two type of gas hydrate structure.
(CO2) [Knowledge]

PART B

ANSWER ALL THE FOUR QUESTIONS

4 X 10 = 40M

11. A Gas Hydrate is both _____ and _____ for the petroleum industry. Describe for both the cases.
(CO1) [Comprehension]
12. Breaking of the hydrate structure is a substantial matter. If not done properly, it can lead to massive explosion. Identify the dangerous aspect of the hydrate dissociation w.r.t environment and people. Summarize the Gas hydrates reservoir that can be dissociated safely to produce gas from it. Indicate a suitable diagram to support your answer.
(CO2) [Comprehension]
13. Outline the number of water molecules available for each type of hydrate structure.
(CO1) [Comprehension]
14. Thermodynamic study is a primary objective to under the gas hydrates behaviour. State the importance of the study. Express this study that can find the gas consumption in a qualitative way other than quantitative. Discuss the important tool to verify it.
(CO2) [Comprehension]

PART C

ANSWER ALL THE TWO QUESTIONS

2 X 20 = 40M

15. The experimental setup for gas hydrate studies contains porous filter and accumulator with back pressure valve. The nature of back pressure valve is the most important during dissociation time. Describe the significance of the valve. Also, mention the importance of porous filter and accumulator during gas release from hydrate reservoir.
(CO3) [Application]
16. Hydrate dissociation is important to understand. State the importance of dissociation through a particular method where gas storage knowledge is required. Also, explain the dissociation w.r.t a proper application in the form of gas hydrate. Show it through a proper diagram of the method.
(CO4) [Application]
