Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - OCT 2023

Semester : Semester VII - 2020
Course Code : PET2007
Course Name : Sem VII - PET2007 - Oil and Gas Surface Facility Design
Program : B. TECH

Date : 31-OCT-2023
Time : 2:00PM - 3:30PM
Max Marks : 60
Weightage : 30%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(5 X 2 = 10M)**

1. ."The retention time assures that equilibrium between the liquid and gas has been reached at separator pressure." Describe the follwing statement.
(CO1) [Knowledge]
2. Mention the significance of surface facility operations used in petroleum refinery.
(CO1) [Knowledge]
3. Define surface facility in petroleum downstream industry.
(CO1) [Knowledge]
4. “Separation of crude from gas is taking a minimum of 3 to 4 min" Define the statement.
(CO2) [Knowledge]
5. Identify the type of separator used in petroleum downstream industry when GOR is low.
(CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(2 X 15 = 30M)**

6. "In a horizontal vessel, it is necessary to place several drains along the length of the vessel. Since the solids will have an angle of repose of 45° to 60°, the drains must be spaced at very close intervals"- Describe the statement.
(CO1) [Comprehension]
7. Explain the basic controlling parameters used for the separation of oil and gas.
(CO2) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION **(1 X 20 = 20M)**

8. Design a suitable Separator with the following parameters:
Gas flow rate – 40 MMscfd at 3.71 lb/ft3
Oil flow rate – 3000 BOPD at 40 OAPI
Operating Pressure – 4000 psia
Operating Temperature – 70 OF
Droplet size removal – 140 microns
Given: CD=0.851; z=0.84; density of water=62.4 lb/ft3Out of the following diameters: d (inch)- 12, 27, 40, and 52.
If the retention time is 7 minutes for the separation of oil from gas then define the type of separator and also find out which one is the optimum diameter for a perfect separation.

(CO2) [Application]