Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JUN 2023

Semester : Semester VI - 2020

Course Code : PET3006

Course Name : Sem VI - PET3006 - Advanced Petroleum Reservoir Engineering

Program : PET

Date : 19-JUN-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.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(10 X 2 = 20M)**

1. Define Instantaneous GOR. Write the equation of it.
(CO3) [Knowledge]

2. Write briefly about the Schilthuis Steady State Model.
(CO1) [Knowledge]

3. What is Tertiary Recovery? Write 3 methods of the Tertiary Recovery.
(CO4) [Knowledge]

4. Successful Reservoir Management requires _____ and _____efforts.
(CO4) [Knowledge]

5. A typical waterflood response is characterized by an _____in oil rate, followed by a _____, and an eventual breakthrough of injected water at the producer well.
(CO2) [Knowledge]

6. Waterflooding are not strictly pressure-maintenance operations. State the proper reason.
(CO2) [Knowledge]

7. What are the different methods of Secondary Recovery Techniques?
(CO2) [Knowledge]

8. If during any long period the production rate and reservoir pressure remain reasonably constant. Is the reservoir voidage rate must be equal to the water influx rate? Write the equation of the water influx rate.
(CO1) [Knowledge]

9. What is the name of the model that can be used to estimate the water influx into a gas or oil reservoir is based on the basic definition of compressibility? Write the equation of the model.
(CO1) [Knowledge]

10. How an engineer can predict the reservoir future production performance as a function of time?

(CO3) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS (4 X 10 = 40M)

11. The following data is available on a volumetric undersaturated oil reservoir-
Pi = 4000 psi, cf = 5E-06 1/psi, co = 5E-06 1/psi
Pb = 3000 psi, cw = 3E-06 1/psi
N = 85 MMSTB, Swi = 30%, Boi = 1.4 bbl/STB.
Estimate cumulative oil production when the reservoir pressure drops to 3500 psi. The oil formation volume factor at 3500 psi is 1.414 bbl/STB.

(CO3) [Comprehension]

12. A typical plot of the oil production rates versus waterflood life for a successful waterflood performance in a reservoir with a gas cap is producing during the effective production time. Discuss all the factors for the effective waterflood operation.

(CO2) [Comprehension]

13. The simplest model that can be used to estimate the water influx into a gas or oil reservoir is based on the basic definition of compressibility. Calculate the cumulative water influx using appropriate model that results from a pressure drop of 200 psi at the oil-water contact with an encroachment angle of 80°. The reservoir-aquifer system is characterized by the following properties:

	Reservoir	Aquifer
Radius, ft	2600	10,000
Porosity	0.18	0.12
cf 1/psi	4E-06	3E-06
cw, 1/psi	5E-06	4E-06
h, ft	20	25

(CO1) [Comprehension]

14. Sound reservoir management is the key to a successful operation throughout the reservoir life. Justify the above statement with a suitable example.

(CO4) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS (2 X 20 = 40M)

15. Reservoir Management is the economic optimization of oil and gas recovery. How can you obtained the above statement effectively? What philosophy is need to be followed to obtain the maximum possible economic recovery from a reservoir? Discuss the philosophy in a sequence wise.

(CO4) [Application]

16. Using the Fetkovich method, calculate the water influx as a function of time for the following Reservoir-aquifer and boundary pressure data. A reservoir-aquifer system has the properties are as follows-
Pi=2740 psi, h=100 ft, ct=7E-06 1/psi, μw=0.55 cp, k=200 md, θ=140°, Reservoir radius=46000', Aquifer radius=9,200'.

t (days)	Pr (psi)
0	2740
365	2500
730	2290
1095	2109
1460	1949

(CO1) [Application]