

Name:
Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, May 2021

Course: Methods of Petroleum Exploitation
Program: B. Tech GIE
Course Code: (PEGS 2019)

Semester: IV
Time 03 hrs.
Max. Marks: 100

SECTION A [6x5=30marks]

- 1. Each Question will carry 5 Marks**
- 2. Instruction: Complete the statement / fill the correct answer(s)**

| S. No. | Question | CO |
|--------|---|-----|
| Q 1 | Fill in the blanks. a) The oil and gas industry records rock and fluid properties with respect to depth using..... in the geological formations intersected by a borehole. b) type of clay is comparatively less dangerous for swelling effect in shale reservoir. c) Three porosity logs are: porosity, acoustic and _____ d) Average density of shale is _____g/cc & coal is.....g/cc. e) Oil window zone temperature ranges from to..... | C01 |
| Q2 | Mention the elements of a petroleum system and define each. | C01 |
| Q3 | Mention five characteristics of a source rock. | C02 |
| Q4 | Mention different types of kerogen and their yield products. | C02 |
| Q5 | Mention five applications of well logging. | C03 |
| Q6 | List different depositional systems in transitional depositional environment. | C03 |

SECTION B[5x10=50marks]

- 1. Each question will carry 10 marks**
- 2. Instruction: Write short / brief notes**

| | | |
|-----|--|-----|
| Q 7 | Describe the Diagenesis, catagenesis and metagenesis processes of petroleum generation. | C03 |
| Q 8 | Illustrate the stratigraphic and structural traps and their implications in petroleum exploration | C03 |

| | | |
|--|---|------------|
| | | C03 |
| Q 9 | Explain the role of diffusion in petroleum migration from source rock to reservoir rocks | C03 |
| Q 10 | Elaborate different types of petroleum traps with sketch. | C04 |
| Q 11 | Discuss the properties of a petroleum reservoir. Give examples | C04 |
| OR | | |
| Q 11 | Illustrate about primary and secondary porosity in carbonate reservoirs | C04 |
| Section C | | |
| 1. Question 12 carries 20 Marks. 2. Instruction: Write long answer. | | |
| Q12 | A shale formation was characterized to assess the gas generation potential using Rock Eval Pyrolysis. Where the free gas released at initial temperature 410degree Celcius, S1 is 4mg/g HC, pyrolyzed gas released is 2mg/g HC, S3 is 1.2 mcCO ₂ /g Rock, TOC =5 %, Tmax is 478 degree, (a) Calculate the Hydrogen Index, Oxygen Index and Production Index for that shale. (b) Interpret the thermal maturity zone and kerogen types. (c) Evaluate the gas generation potential. <p style="text-align: center;">(10+5+5)</p> | C05 |
| OR | | |

Q12

C05
[10+5+5]

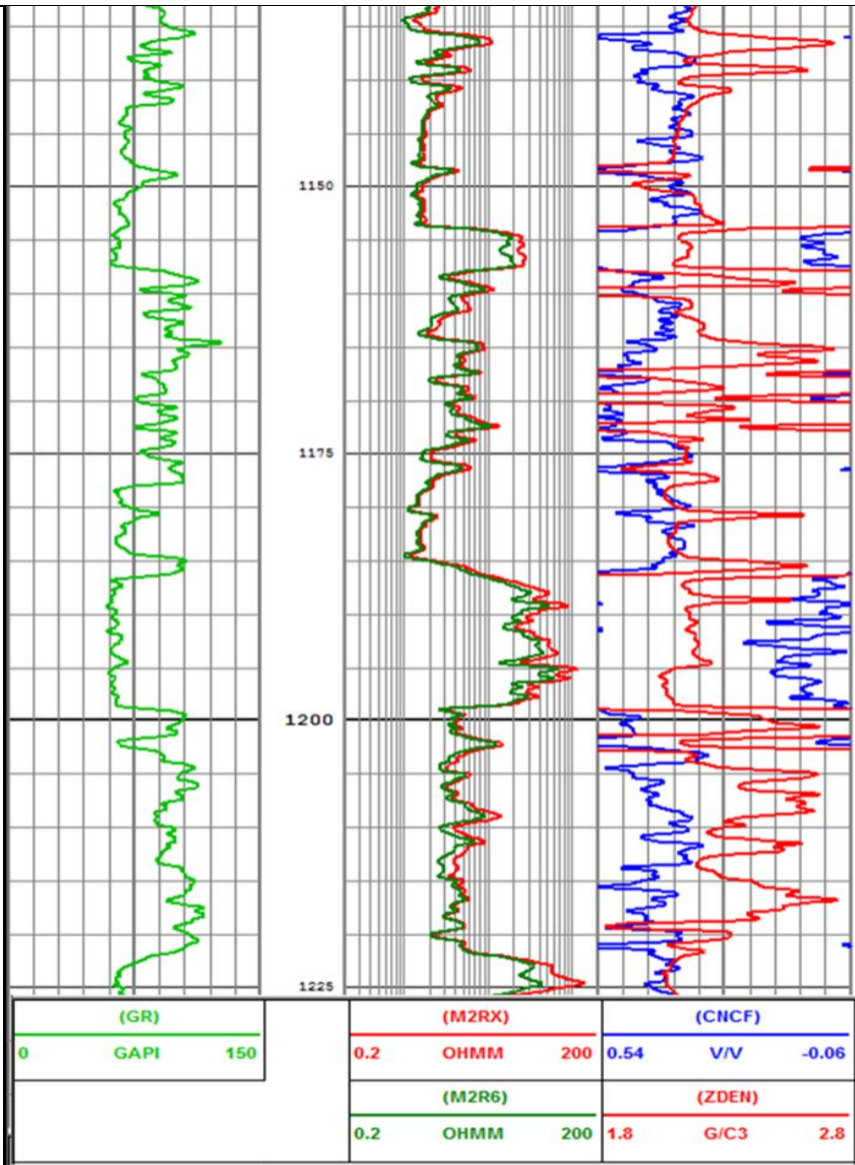


Fig 1

- Identify lithology and mark in the log section (fig1)
- Interpret the hydrocarbon bearing zone and assess the reservoir quality based on shaliness