UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: M.Tech Petroleum Engineering
Semester : I
Subject (Course): Petroleum Geology   **Max. Marks   : 100**
Course Code   : PTEG 702   **Duration   : 3 Hrs**
No. of page/s: 03

SECTION A
Compulsory
[20 Marks]

Q.1   Write short Notes on: [5+5]
     (a) HELP
     (b) Gaining Access Phase in oil and gas field life cycle

Q.2   Give full form of the following.   [5]
     (a) GHG   (b) NDR   (c) BOE   (d) OALP   (e) PSC

Q.3   **Fill in the blanks**   [5]

     (a) As -------------- phase approaches, EOR methods like injection
        of Water, CO_2 and steam, in – situ combustion method etc. are
        applied for recovering the remaining proportion of HCs .

     (b) In shallow tropical waters, opportunities may exist to use
        decommissioned platforms and jackets as ------------ -------- in
        a designated offshore area.

     (c) Secondary growth of quartz or calcite do not bear any relation
        with ------------ and -------------

     (d) World's first commercial oil well drilled in 1859 at ------------- in
        Pennsylvania, USA at 21.2 m

     (e) The process where crude oil is formed from the remaining
        Kerogen at a temperature above 175°C is known as **--------------.**

SECTION –B
[40 Marks]

Q.4   Although NELP rounds have attracted many private & foreign   [8]
       companies, in addition to public sector oil companies, But it had failed
       in many ways. Justify the statement.

Q.5   Explain what is meant by kerogen and describe the various types of   [8]
       kerogen..

Q.6   Describe the mechanism of hydrocarbon migration. Illustrate your   [8]
       answer with neat figure.

Q.7   Name the factors that are required to be present for hydrocarbon   [8]
       generation and its entrapment.

Q.8 (a)   Describe the controlling factors that reduce the porosity in a reservoir   [8]
           rock.

OR,

8(b)   Describe the volumetric method of reserve estimation and also mention
        the limitations of the volumetric method of estimation.

SECTION –C
[40 Marks]

Q.9   (a) Define the term sedimentary basin.   [2+6+12]
       (b) Describe the theories for basin formation.
       (c) Describe the various types of divergent basins.

Q.10   (a) Define the term hydrocarbon trap.   [2+18]
        (b) Describe hydrocarbon trapping mechanism with neat figure.

OR,

(a) You are given the following data for a gas field

                                                                    [10+10]

- Area = 178 acres
- Net productive thickness = 41 ft
- Initial reservoir pressure = 3250 psia
- Porosity = 25%
- Connate water = 27%
- Initial gas FVF = 0.00533 ft3/SCF

- Gas FVF at 2500 psia = 0.00667 ft3/SCF
- Gas FVF at 500 psia = 0.03623 ft3/SCF
- Sgr after water invasion = 24%

Calculate

1. Initial gas in place
2. Gas in place after volumetric depletion to 2500 psia
3. Gas in place after volumetric depletion to 500 psia
4. Gas in place after water invasion at 3250 psia
5. Gas in place after water invasion at 2500 psia
6. Gas in place after water invasion at 500 psia

(b) Name different types of reservoir drive mechanism. Describe the water drive mechanism with suitable figure.

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