

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES****End Semester Examination, MAY 2018****Program: B. Tech. (CS in Oil & Gas Informatics)****Semester – IV****Subject (Course): Upstream Petroleum:****Exploration & Production****Max . Marks: 100****Course Code : GSEG221****Duration: 3 Hrs.****No. of page/s: 3 (THREE)**

THIS PAPER CONTAINS 3 (THREE) SECTIONS, ALL THE SECTIONS ARE CUMPULSORY, ASSUME ANY MISSING DATA.**SECTION A**

There are FIVE (05) Questions of 4 marks each. All the questions are compulsory
Limit your answer to maximum of 60 words

Question- 1

Define Porosity and give the various relations in which porosity of the medium can be represented. Also differentiate between absolute and effective Porosity.

Question-2

Discuss conceptual approach of Permeability with special reference to its characteristics.

Question-3

Indicate the reservoir related the three basic / vital parameters responsible for production of hydrocarbon. Also describe briefly, the inherent energy of Hydrocarbon Reservoir - that find its applicability in the production process.

Question-4

Indicate the applicability of capillary pressure concept in hydrocarbon reservoir from hydrocarbon production point of view.

Question-5

Define relative permeability. Also draw the two phase relative permeability curves of Water – Oil System.

SECTION - B

There are Four (04) Questions of 10(Ten) marks each. All the questions are compulsory
Limit your answer to maximum of 200 words

Question- 1

Discuss the importance of Averaging of Reservoir Porosity. Also calculate the arithmetic average and thickness-weighted average porosity from the following measurements:

Continued on Page-2

Question-1 (Continued from Page-1)

Sample	Thickness, ft	Porosity, %
1	1.0	10
2	1.5	12
3	1.0	11
4	2.0	13
5	2.1	14
6	1.1	10

Question-2

Discuss the Principle of Volumetric Method of Reserve Estimation. Consider an oil reservoir having thickness of 105 feet with an average porosity of 18.5% and average water saturation of 25%. This well has a drainage area of 160 Acres. If the recovery efficiency of the well is considered to be 15%, what will be the recoverable reserves. The initial oil formation volume factor may be taken as 1.2 .

Question-3

Explain Capillary Pressure of Reservoir Rocks and discuss it with respect to following:

- (a) Size of transition zone
- (b) Fluid movements

Question-4

Describe briefly -‘Gravity Drainage’ and indicate its impact on the recovery efficiency of oil reservoir.

SECTION - C

There is only Two (02) Questions of 20(Twenty) marks each.

Both questions are compulsory.

Limit your answer to maximum of 500 words

Question- 1

What do you understand by volumetric hydrocarbon reservoir? Also discuss oil production drive mechanism of an under saturated volumetric oil reservoir.

Or

A volumetric Gas Reservoir has the following characteristics

A = 3000 acres h = 30 ft $\Phi = 0.15$ $S_{wi} = 20\%$ T = 150°F $p_i = 2600$ psi

p	z
2600	0.82
1000	0.88
400	0.92

Calculate cumulative gas production and recovery factor at 1000 and 400 psi.

Section-C (Continued from Page-2)

Question-2

- (a) Discuss the possible Drive Mechanism for a Saturated Oil Reservoirs with special reference to Development scenario and Economic Yield.**

- (b) Find the volume occupied by remaining oil where original oil in place was 1800STB and cumulative production was 987STB. Oil formation volume factor is 1.758.**