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Enrolment No:



UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

Online End Sem. Examination, Dec. 2021

Course: Coal Bed Methane, Gas Hydrates and Shale Technology

Programme: M.Tech (PE)

Course Code: PEAU 8001

Semester: III

Time: 03 hrs.

Max. Marks: 100

SECTION A

1. Each Question will carry 4 Marks

2. Instruction: Complete the statement / Select the correct answer(s)

Sl. No.	Question	CO
Q 1	(A) Which of the following is the type of unconventional reservoir (i.) Shale Gas and Shale Oil (ii.) Tight Gas Sands (iii.) Tar sands (iv.) All (B) What makes reservoir Unconventional (i.) Higher permeability (ii.) Gas and oil migration (iii.) Extensive stimulation (iv.) None (C) Which of the following in source rock expel hydrocarbons upon thermal cracking (i.) Bitumen (ii.) Kerogen (iii.) Shale (iv.) All (D) The H:O ratio in type I kerogen is about (i.) 1.2 to 1.7 (ii.) 1.65 (iii.) <0.84 (iv.) 1.8 to 2.5	CO1
Q 2	(A) The migration of hydrocarbons from the source rock to an adjacent permeable carrier bed is called (i.) Primary Migration (ii.) Secondary Migration (iii.) Tertiary migration (iv.) Quarternary migration (B) Matrix permeability of tight reservoir is (i.) Less than 0.1 mD (ii.) More than 0.1 mD (iii.) More than 1 mD	CO1

	<p>(iv.) In between 1 to 2 mD</p> <p>(C) The permeability of fractured reservoirs changes with the stress applied to them</p> <p>(i.) True</p> <p>(i.) False</p> <p>(D) Reservoir evaluation is mainly carried out to determine</p> <p>(i.) Bulk Volume Hydrocarbon</p> <p>(ii.) Maturity</p> <p>(iii.) Clay Content</p> <p>(iv.) All</p>	
Q 3	<p>(A) The movement of hydrocarbons along a "carrier bed" from the source area to the trap is called as</p> <p>(i.) Primary Migration</p> <p>(ii.) Secondary Migration</p> <p>(iii.) Tertiary migration</p> <p>(iv.) All</p> <p>(B) which of the following is the stage of hydraulic fracturing</p> <p>(i.) Pre flush</p> <p>(ii.) Pad stage of viscous fluid</p> <p>(iii.) Proppant laden stage</p> <p>(iv.) All</p> <p>(C) The sedimentary rock which does not contain oil is called as</p> <p>(i.) Shale oil</p> <p>(ii.) Tight oil</p> <p>(iii.) Oil shale</p> <p>(iv.) Shale</p> <p>(D) Lamosite and torbanite are types of oil shales associated with</p> <p>(i.) Lacustrine environments</p> <p>(ii.) Marine environments</p> <p>(iii.) Terrestrial environments</p> <p>(iv.) None</p>	CO1
Q 4	<p>(A) Generally, the coal bed methane (CBM) is predominantly consists of</p> <p>(i.) Methane (CH₄)</p> <p>(ii.) Ethane (C₂H₆)</p> <p>(iii.) Carbon dioxide (CO₂)</p> <p>(iv.) All</p> <p>(B) Initial gas content is determined using</p> <p>(i.) Desorbed gas</p> <p>(ii.) Lost gas</p> <p>(iii.) Residual gas</p> <p>(iv.) All</p> <p>(C) Which of the following is also called as liptinitic kerogen</p> <p>(ii.) Type I Kerogen</p> <p>(iii.) Type II Kerogen</p> <p>(iv.) Type III Kerogen</p> <p>(v.) Type IV Kerogen</p> <p>(D) The existence of gas in solution results with</p>	CO2

	(i.) Increases in GOR (ii.) Decrease in GOR (iii.) Increase in viscosity (iv.) All	
Q 5	(A) Coalbed methane reservoirs are considered as (i.) Dual-porosity reservoirs (ii.) Single-porosity reservoirs (iii.) Pseudo-porosity reservoirs (iv.) None (B) Adsorption isotherm is plotted keeping (i.) Temperature constant (ii.) Pressure constant (iii.) Volume constant (iv.) Flow constant (C) The shallow bogs and swamps with low amounts of oxygen is associated with (i.) Lacustrine environments (ii.) Marine environments (iii.) Terrestrial environments (iv.) None (D) Fracture permeability has no role in transportation of gas during CBM production (i.) True (ii.) False	CO2

SECTION B

1. Each question will carry 10 marks

2. Instruction: Write short/detailed notes

Q 6	Explain the following: (a) Difference between the Conventional and Unconventional reservoirs (b) Describe in detail Kerogen and their types OR Describe in details the common issues of drilling in unconventional reservoirs	CO1
Q 7	Explain tight oil reservoirs and their characteristics	CO2
Q 8	Describe the following drilling technique (a) Conventional Drilling (b) Slim-Hole Drilling	CO2
Q 9	Describe in detail the classification of oil shale	CO3

SECTION-C

1. Each Question carries 20 Marks.

2. Instruction: Write long answer.

Q 10	Discuss the following coal bed methane reservoir property in detail (a) Porosity (b) Permeability (c) Adsorption Capacity (d) Thickness of coal seam and initial reservoir pressure OR	CO3
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	Discuss the following in detail (a) Gas hydrate structure and composition (b) Time-dependent properties of gas hydrates	
Q 11	Critically evaluate the various stages of hydraulic fracturing for stimulation in coal bed methane reservoir.	CO4