Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2021

Course: Sedimentology & Sequence Stratigraphy
Programme: M.Sc [PGS]
Time: 03 hrs.
Semester: I
Course Code: PEGS 7006
Max. Marks: 100

Instructions:

- *An internal option is given in questions 8 & 9*
- *Section A (Short answer type from Q1 to Q5, 4 marks each)*
- *Section B (Short notes type from Q6 to Q9, 10 marks each)*
- *Section C (Q10 and Q11, Long answer type)*

SECTION A
(Scan and upload) **(5Q x 4M = 20 Marks)**

S.N.		Marks	CO
Q 1	Illustrate the process of Alluvial Fan deposition.	**4**	**CO1**
Q.2	Explain the process of primay & secondary porosity development in carbonate rocks.	**4**	**CO2**
Q.3	Define the lithological characteristic of meandering river system deposition.	**4**	**CO1**
Q.4	Define four sedimentary structures, which are used for palaeocurrent analysis.	**4**	**CO1**
Q.5	Illustrate any four geological factors which are involoved to change the porosity with respect to depth.	**4**	**CO3**

SECTION B
(Scan and upload) **(4Q x 10M = 40 Marks)**

Q.6	Explain any three sedimentary structures associated with fluvial depositional sequences, supported by an annoted lithologs.	**5+5**	**CO1**
Q.7	Differentiate clastic and non clastic reservoir rocks. Explain the importance of biogenic structures in hydrocarbon exploration.	**5+5**	**CO3**
Q.8	Illustrate rift basin. Why rift basin is prolific basin for mineralization?	**10**	**CO4**
Q.9	**Explain the following in a short note on <u>any two</u>** i. Stromatolite ii. Permeability iii. Transgression iv. Herringbone cross stratification	**5+5**	**CO2**
	OR		
	i. Explain the process of formation of carbonate platforms. ii. Justyfy the statement with Geological concepts "Carbonate rocks are mostly fossiliferous and precipitate only warmer condition under shallow water column".	**5+5**	**CO2**

SECTION-C
(Scan and upload) **(2Q x 20M = 40 Marks)**

<table>
<tr><td>Q.10</td><td>Explain, thermal hypothesis for Sedimentary basin formation. Develop the porosity and depth relationship and calculate the compacted porosity, of given lithology at depth of 4 km from the surface.
<table>
<tr><th></th><th>Shale</th><th>Sandstone</th><th>Limestone</th></tr>
<tr><td>Θ_0</td><td>30%</td><td>20%</td><td>25%</td></tr>
<tr><td>C m^{-1}</td><td>$5x10^{-4}$</td><td>$3x10^{-4}$</td><td>$7x10^{-4}$</td></tr>
</table></td><td>5+15</td><td>CO4</td></tr>
<tr><td>Q.11</td><td>Explain the importance of below given geological structures/methods in Petroleum Exploration. Draw appropriate diagram to support your answer:
i. Back stripping methods
ii. MISS
iii. Deep Sea Fan Delta
iv. Neritic Zone</td><td>4X5</td><td>CO3</td></tr>
<tr><td></td><td>OR</td><td></td><td></td></tr>
<tr><td></td><td>i. Solve the problem related to an exploratory well showing a 300m thick shale horizon that is now at a depth of 2km. The porosity of shale is 27% at 2 km and 70% at the surface. Calculate the decompacted thickness of the unit.
ii. Explian and draw the dynamic topography of earth.</td><td>(15+5)</td><td>CO3</td></tr>
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