Roll No: | | | | | | | | | | | |

PRESIDENCY UNIVERSITY

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
Approved by AICTE, New Delhi | Approved By BCI
Bengaluru

Mid Term Examinations - October 2026

Date: 07/10/2026 **Time:** 09:30 AM - 11:00 AM

Course Code: PET3107 **Course Name:** Shale Gas

Semester: Fifth Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2	CO3
Marks	22	24	44

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	Define the term Total Porosity.	2	CO1	BT1
2	Describe Organic Porosity.	2	CO2	BT1
3	State in brief the Vitrinite Reflectance (Ro%).	2	CO2	BT1
4	Define Young's modulus and write its formula.	2	CO3	BT1
5	State Uniaxial Compressive Strength (UCS).	2	CO3	BT1

PARTB: Answer Any 1 Following Questions. 20 M

Q.N.	Questions	M	CO	BT
06.A	Explain the different Environments of Shale Deposition.	10	CO1	BT2
06.B	Explain the ternary plot (kerogen assessment) and its components with a neat sketch.	10	CO2	BT2
07.A	Describe the different processes of Diagenesis.	10	CO1	BT2
07.B	Explain the Quantitative approach of Organic Matter in Gas Shales.	10	CO2	BT2

PARTC: Answer Any 1 Following Questions. 20 M

Q.N.	Questions	M	CO	BT

PTO (Please Turn Over)

<table>
<tr>
<td>08.A</td>
<td>A different shale core sample (diameter = 30 mm, original length = 60 mm) is tested in uniaxial compression, giving the following results:
<table>
<tr><th>Load (N)</th><th>Extension (mm)</th></tr>
<tr><td>0</td><td>0</td></tr>
<tr><td>8000</td><td>0.03</td></tr>
<tr><td>16000</td><td>0.06</td></tr>
<tr><td>24000</td><td>0.09</td></tr>
<tr><td>32000</td><td>0.12</td></tr>
<tr><td>34000</td><td>0.18</td></tr>
<tr><td>35500</td><td>0.28</td></tr>
<tr><td>33000</td><td>0.35</td></tr>
</table>
Using the stress-strain analysis method
I) Calculate the stress and strain for each data point.
II) Sketch the stress-strain curve.</td>
<td>10</td>
<td>CO3</td>
<td>BT3</td>
</tr>
<tr>
<td>08.B</td>
<td>Using the data given in question no 8.A.
III) Determine the Young's Modulus of this sample from the linear portion of the curve.
IV) Identify the yield stress and the Ultimate Compressive Strength (UCS) of this sample.</td>
<td>10</td>
<td>CO3</td>
<td>BT3</td>
</tr>
<tr>
<td>09.A</td>
<td>Apply the Mechanical Earth Model (MEM) workflow to interpret the evaluation of wellbore instability in a VTI shale formation, considering the directional dependency of geomechanical parameters.</td>
<td>10</td>
<td>CO3</td>
<td>BT3</td>
</tr>
<tr>
<td>09.B</td>
<td>Illustrate how each laboratory test is applied to estimate the mechanical properties of shale.</td>
<td>10</td>
<td>CO3</td>
<td>BT3</td>
</tr>
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