## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
### End Semester Examination, May 2019

**Course:** Sedimentary and Petroleum Geology **Semester: IV**
**Program:** B.Tech APE_UP **Time 03 hrs.**
**Course Code: PEGS 2002** **Max. Marks: 100**
**Instructions:** Draw appropriate diagram where required.

### SECTION A

| S. No. | | Marks | CO |
|---|---|---|---|
| Q 1 | Discuss Udden-Wentworth grade scale in brief. | 5 | CO1 |
| Q 2 | Define development process of Bouma sequence with labeled figure. | 5 | CO4 |
| Q 3 | Explain textural maturity of a sandstone reservoir based on length of transportation. | 5 | CO1 |
| Q 4 | **True or False-**<br><br>a) The Biodegradation of crude oil typically decrease the viscosity.<br>b) Permeability decreases with decreasing grain size.<br>c) TOC means to Total Oil Chemistry.<br>d) Isopach map is a contour map of thickness that illustrate formation thickness.<br>e) NRV * NTG = GRV. | 5 | CO6 |

### SECTION B

| Q 5 | Explain in detail about the classifications of Limestone rocks given by Folk. | 10 | CO3 |
|---|---|---|---|
| Q 6 | Give definitions of the followings and draw appropriate figures-<br><br>**(Any Five)**<br><br>a) Herring bone cross bedding<br>b) Current ripples<br>c) Bedding plane<br>d) CCD<br>e) Burrow<br>f) Stramatolites | 2 x 5 | CO2 |
| Q7 | Describe the Walther's law of correlation of facies and its application in paleo sedimentary environment determination. Draw suitable figures to support your logic. | 10 | CO4 |

| Q8 | Illustrate the textural maturity and depositional changes between a Meandering river and a Braided river set up. Draw neat sketch and mark associated geological features. | **10** | **CO3** |
|---|---|---|---|
| | **OR** | | |
| | Explain the origin of Rudaceous rocks. Give general classification, supported by neat diagrams. | **2+8** | |
| | **SECTION-C** | | |
| Q 9 | **Petroleum System Analysis-**<br>a) Illustrate six important Geological elements of Petroleum System characterization,<br>b) Prepare a Risk matrix based on given parameters and explain the results,<br><br>RP: (.9)   SP: (.95)   SC: (1)   A: (.85)   T: (.95)   RD: (.70)<br><br>c) Calculate GCF from risk matrix and explain its significance in prospect ranking and risking. | **10+5+5** | **CO6** |
| Q10 | **Sequence stratigraphy analysis-**<br><br>a) Analyze and draw a depositional sequence with one cycle of sea level change, annotated by system tracts and SB.<br>b) Explain the variation in deposition style of different systems tracts (starting from falling stage to high stand systems).<br>c) Draw appropriate diagram to support your interpretation, | **5+10+5** | **CO5** |
| | **OR** | | |
| | **Illustrate to followings-**<br>a) Determine how sea level changes/ variable sediment supply affects the stacking patterns of different parasequences. (with diagrams)<br><br>b) Explain the important parameters used for seismic facies analysis,<br>c) Draw five types of seismic facies patterns with definition. | **10+5+5** | |

# SECOND SET OF PAPER

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<tr><td>Name:<br><br>Enrolment No:</td><td colspan="2" align="center">**UPES**<br>UNIVERSITY WITH A PURPOSE</td></tr>
<tr><td colspan="3" align="center">**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**<br>**End Semester Examination, May 2019**</td></tr>
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## SECTION A

| S. No. | | Marks | CO |
|---|---|---|---|
| Q 1 | Explain sedimentary structures of Biogenic origin and their significance. | **5** | **CO1** |
| Q 2 | Discuss the mechanism of fining upward and coarsening upward depositional sequences. | **5** | **CO2** |
| Q 3 | Define the Calcite Compensation Depth (CCD) and its significance in paleo-geological interpretation. | **5** | **CO3** |
| Q 4 | **True or False-**<br><br>a) Lithic fragments will be dominating in long distance transported sediments,<br>b) Shale rock having grater depositional porosity then sandstone rock.<br>c) Chalk is a clastic sedimentary rock,<br>d) Conversion of 64mm Grain size is equals to -4 Phi,<br>e) Packing density controls the porosity of the rocks, | **5** | **CO2** |
| | | | |

## SECTION B

| | | | |
|---|---|---|---|
| Q 5 | Illustrate the basic composition of carbonate rocks. Define any five types of carbonate porosities, supported by appropriate diagrams. | **10** | **CO1** |
| Q 6 | Explain in detail about the classifications of Limestone rocks given by Dunham. | **10** | **CO3** |
| Q7 | Establish Walther's law of correlation of facies and it's importance in geological interpretation of depositional environment. | **10** | **CO4** |
| Q8 | Describe the followings with labeled diagrams-<br>    a) Mass transport complexes (MTCs)<br>    b) Deepwater turbidites | **5+5** | **CO4** |
| | OR | | |

| | Describe the followings with labeled diagrams- <br><br> a) The important characteristics of Delta deposits, <br> b) Morphological classification of Deltas, | 5+5 | |
|---|---|---|---|
| | **SECTION-C** | | |
| Q 9 | Illustrate the followings- (Draw appropriate figure) <br><br> a) Theories of hydrocarbon origin- Organic and Inorganic <br> b) Structural, Stratigraphic and Combined traps formation mechanism for hydrocarbon accumulation, <br> c) Prepare a Risk matrix of a prospect based on given parameters and explain your results, <br><br> **Prospect A-** RP: (.87) SP: (.85) SC: (1) A: (.95) T: (.90) RD: (.80) <br><br> d) Calculate GCoS from risk matrix and highlight the key risk for this prospect, | 5+5+5 +5 | CO6 |
| Q10 | **Sequence stratigraphy analysis-** <br><br> a) Analyze and draw a depositional sequence with one cycle of sea level change, annotated by system tracts and SB. <br> b) Explain the variation in deposition style of different systems tracts (starting from falling stage to high stand systems). <br> c) Draw appropriate diagram to support your interpretation, | 5+10+ 5 | CO5 |
| | OR | | |
| | **Illustrate the following conditions-** <br><br> 1) Define Eustatic and relative sea level changes <br> 2) Which type of sediments will be accumulated in basin during FSST and how will they interpreted on seismic data, <br> 3) Determine how sea level changes/ variable sediment supply affects the stacking patterns of different parasequences (Draw figures). | 5+5+ 10 | |