

Name:	 UPES UNIVERSITY WITH A PURPOSE
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2020

Course: Basin Analysis	Semester: V
Program: B. Tech Geoinformatics Engineering [GIE]	Time 03 hrs.
Course Code: PEGS 3018	Max. Marks: 100

SECTION A

1. Each Question will carry 5 Marks
2. Instruction: Complete the statement / Select the correct answer(s)
3. All Questions are compulsory.

S. No.		Marks	CO
Q 1	Define Sequence Stratigraphy.	5	CO1
Q 2	Select True/False- i. Rift basin develop only in Transform plate margin. ii. Pull apart basin is related to strike slip deformation. iii. Relative Sea Level represent only global reference surface. iv. Backtripping methods use for depositional history analysis of any sedimentary basin. v. Subsidence analysis is not a component of basin modeling.	5	CO2
Q 3	Write any Five components of basin modelling.	5	CO3
Q 4	Fill in the Blanks- i. Name of Petro physical Properties are..... ii. Example of category IV basin in India is..... iii. Dissolution porosity develop only inRocks. iv. Porosity and depth show.....Relationship. v. Herringbone structures develop inDepositional environment.	5	CO4
Q 5	Define Airy model of Isostasy.	5	CO1
Q 6	Give the name of any Five petroliferous basins of India from category I.	5	CO2

SECTION B

1. Each question will carry 10 marks.
2. Instruction: Write short / brief notes.
3. Attempt all the Questions.

Q 7	Create difference between Alluvial fan and Deltaic depositional Sequences.	10	CO1
Q 8	Write a short notes on any two: i- Gilbert type delta ii- Foreland Basin iii- Base Level	10	CO3

Q 9	An exploratory well has encountered a 300m thick shale horizon at a depth of 2km. The total porosity of shale is measured as 27% at 2 km and 70% at the surface. Calculate the decompacted thickness of the unit?	10	CO4												
Q 10	Calculate the compacted porosity of given lithology at depth of 4 km from the surface.	10	CO4												
	<table border="1"> <thead> <tr> <th></th> <th>Shale</th> <th>Sandstone</th> <th>Limestone</th> </tr> </thead> <tbody> <tr> <td>Initial Porosity [Θ_0]</td> <td>40%</td> <td>30%</td> <td>40%</td> </tr> <tr> <td>Compaction rate/meter [C m⁻¹]</td> <td>5x10⁻⁴</td> <td>3x10⁻⁴</td> <td>7x10⁻⁴</td> </tr> </tbody> </table>				Shale	Sandstone	Limestone	Initial Porosity [Θ_0]	40%	30%	40%	Compaction rate/meter [C m⁻¹]	5x10 ⁻⁴	3x10 ⁻⁴	7x10 ⁻⁴
	Shale			Sandstone	Limestone										
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Q 11	Classify and define the basins related to Divergent plate margin.	10	CO3												

SECTION-C

- 1. Each Question carries 20 Marks.**
2. Instruction: Write long answer.

Q 11	Discuss the evolution of compressional, extensional, and pull apart basins under the three dimensional stress environment.	20	CO3
	OR		
	Large area of continent consists of 30 km of crust with density 2.8 Mg/m ³ over 90 km of material with density 3.1 Mg/m ³ . The asthenosphere density is 3.2 Mg/m ³ . This region is covered with a 1.6 km thickness of ice of density 0.9 Mg/m ³ . The ice covered region is assumed to be isostatic equilibrium. Then, the ice melts. By how much will the rock surface of the continent change when the new isostatic equilibrium is re-established?	20	CO4