

<b>Name:</b>	 <b>UPES</b> <small>UNIVERSITY OF TOMORROW</small>
<b>Enrolment No:</b>	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Term Examination, January 2022**

<b>Programme Name:</b> M. Sc. (PG)	<b>Semester :</b> III
<b>Course Name :</b> Drilling and Production Operations	<b>Time :</b> 3 hour
<b>Course Code :</b> PEGS8006	<b>Max. Marks :</b> 100 marks
<b>Nos. of page(s) :</b> 2	

**Instructions: All questions are compulsory.**

**SECTION A**

Sl. No.		Marks	CO
Q1.	List some environmental impacts caused by drilling operations.	4	CO1
Q2.	Discuss role of cement additives in drilling operations.	4	CO2
Q3.	Explain the working of a rotary kelly drive rig and a top drive rig.	4	CO2
Q4.	Briefly discuss the causes and early warning sign of kick.	4	CO1
Q5.	Explain primary, secondary, and tertiary well control methods.	4	CO2

**SECTION B**

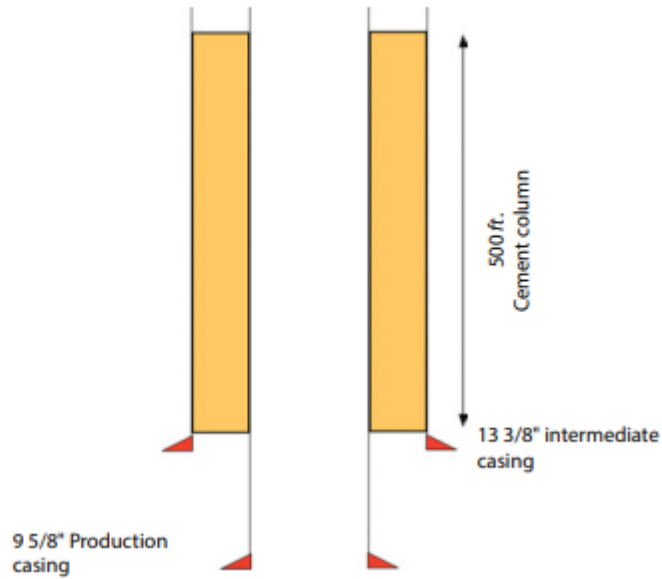
Q6.	Discuss different offshore drilling rigs with suitable sketch.	10	CO3
Q7.	Illustrate and discuss typical well completion methods in detail.	10	CO4
Q8.	Explain Well Planning for a drilling operation in detail with the help of a flowsheet. Or Discuss with the help of diagram different types of ram preventers in a BOP stack.	10	CO3
Q9.	Analyse different well killing methods using pressure profile diagrams.	10	CO4

**SECTION C**

Q10.	a. Discuss circulating system on a conventional land drilling rig with the help of sketch and explain functions of each of the components.  b. An intermediate casing string was cemented using the following muds: first section 7,000 ft was filled by 11.5 lbm/gal mud, second section of 1,500 ft was filled by 14.3 lbm/gal mud and the last section was filled by 15 lbm/gal mud. Calculate the total hydrostatic pressure at 11,000 ft. Convert the pressure at 11,000 ft to an equivalent mud weight and determine if it will exceed the fracture gradient of 13.2 lbm/gal. Also calculate the ECD for an annular pressure loss gradient of 0.04 psi/ft and an original mud weight of 12.5 ppg.	20	CO5
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Q11.

- a. Explain the different types of cementing operations. Differentiate between primary cementing and squeeze cementing.
- b. Calculate the slurry volume required to cement the 500 feet cement column in the casing schematic below. How many sacks of cement were used if slurry yield was  $1.12 \text{ ft}^3/\text{sack}$ ?



20

CO5