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# PRESIDENCY UNIVERSITY, BENGALURU

## SCHOOL OF ENGINEERING

Weightage: 40 % Max Marks: 40 Max Time: 2 hrs. 11 May Friday 2018

## ENDTERM FINAL EXAMINATION MAY 2018

## SET 1

Even Semester 2017-18 Course: **PET 307 Directional Drilling** VI Sem. Petroleum

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**Instructions:**

*(i)* *Read the question properly and answer accordingly.*

*(ii)* *Question paper consists of 3 parts.*

(iii) Scientific and Non-programmable calculators are permitted

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**Part A**

(10Q x1M=10 Marks)

1. Answer all Question:
    a. Which is the **least accurate** Survey Calculation method?
    b. How will you modify Balance tangential method to Minimum curvature method?
    c. What is the accuracy level for Azimuth in MWD?
    d. “Over shot is a Negative engagement tool”-True/False
    e. Which telemetry system will you prefer if the wellbore is filled with incompressible drilling fluid (Underbalance Drilling)?
    f. Which type of milling tool will you recommend if a hammer fell into the well bore?
    g. Give two example of Non-positive fishing tool.
    h. Which kind of borehole condition is preferable to run an EMWD tool?

i. What is the Temperature and Pressure range for MWD tool?
j. What is the recommended Radius of curvature for a “Short Radius” Horizontal well?

**Part B (Any FOUR)**

(4 Q x 3 M= 12 Marks)

2. How do the following factors affect the selection of fishing tool?
    a. OD/ID of fish
    b. Top of the fish is smooth/rough.
3. Write two advantages and a disadvantage of Electromagnetic telemetry system.
4. Write three difference between EM telemetry and Conventional Mud telemetry system.
5. Write three advantage of Horizontal directional well.
6. ***“Stuck pipe is one of the major causes of fishing job***”- Give three causes of stuck pipe and explain.

**Part C**

(3Q x 6 M = 18 Marks)

7. What are the basic component of MWD tool? What are the different type of power source use in MWD tool? Do comparison between the two types of power source.
8. “Some ABC company win a bid for an abandon oil well located near Presidency University. When they remove the cement plug they found that the previous company left the permanent packer along with the 3 inch tubing string inside borehole. Also there are some metallic junks present at the bottom of the well. The tubing must have disengaged/part off from the tubing hanger as top of the tubing is not smooth. On the rig site there is no fishing tool available which has OD less than 3 inch.”

Based on the above scenario prepare you fishing plan to recover all the fish from the well so that the current company can run a new string of casing and tubing.

9. Coordinates of a Directional well are as follows,

| | **DEPTH (ft.)** | **Inclination(Degree)** | **Azimuth (Degree)** |
|---|---|---|---|
| KOP | 6121 | 32 | 14 |
| End of BUS | 6332 | 36 | 8 |
| End of HOS | 6542 | 34 | 358 |

Find out the DLS at the BUS and also calculate the increment towards North and East using Modified balance tangential method.

10. Write a short note on:
    a. Slant hole Drilling
    b. Underbalance Drilling

# PRESIDENCY UNIVERSITY, BENGALURU

## SCHOOL OF ENGINEERING

Weightage: 20 % Max Marks: 20 Max Time: 1 hr. 28 Mar Wednesday 2018

## TEST – 2 (SET 1)

Even Semester 2017-18 Course: **PET 307 Directional Drilling** VI Sem. Petroleum

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**Instruction:**

*(i) Read the question properly and answer accordingly.*
*(ii) Question paper consists of 3 parts.*
(iii) Scientific and Non-programmable calculators are permitted

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### Part A

(3 Q x 1 M = 3 Marks)

1. What is the function of Universal Joint?
2. What are the different type of bearing present in Turbine Motor?
3. NMDC are made up of which material?

### Part B

(3Q x 3 M =9 Marks)

4. A drill string assembly has: **"3 Strands of Dp+5Strands of NMDC+Drill Bit"**

Using the above assembly we are surveying two different holes. The bore hole condition for both hole are as follows

a. OPEN HOLE b. CASED HOLE

Which hole will give us more accurate value with less error and Why?

5. What are the components of Magnetic Single Shot Survey tool? Write two disadvantage of this tool.
6. Write three advantage of Air drilling.

### Part C

(2Q x4 M=8 MARKS)

7. What is the main *concept* behind PDM? Five different PDM has Rotor Stator arrangement as follows:
   a. 3:4 c. 16:17 d. 17:18
   b. 22:23 d. 1:2

   Arrange them in the increasing order of Torque and RPM.
8. Write down four difference between PDM and Turbo drill.

# PRESIDENCY UNIVERSITY, BENGALURU

## SCHOOL OF ENGINEERING

Weightage: 20 % Max Marks: 20 Max Time: 1 hr. 20 Feb Tuesday 2018

## TEST – 1

Even Semester 2017-18 Course: **PET 307 DIRECTIOANL DRILLING** VI Sem. Petroleum

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**Instruction:**

*(i) Read the question properly and answer accordingly.*
*(ii) Question paper consists of 3 parts.*
(iii) Scientific and Non-programmable calculators are permitted

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**Part A**

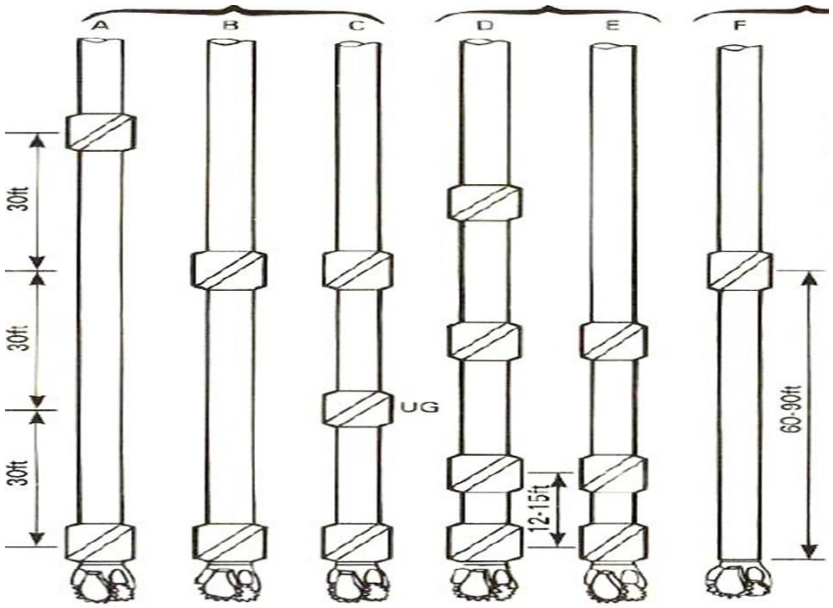
(3Q x 1 M= 03 Marks)

1. What is “Slick BHA”?
2. While drilling if you encounter a ‘Salt-dome”, which type of Well profile you will prefer?
3. “Target is too deep but horizontal displacement is too short”- Select the well geometry
   a. BUILD-HOLD b. BUILD-HOLD-DROP c. DEEP KICK OFF

**Part B**

(4 Q x 3 M= 12 Marks)

4. What are the different type of stabilizer? Write down the functions of a Stabilizer?
5. Write two **NON-PETROLEUM** and four **PETROLEUM** application of directional drilling?
6. Explain how “WHIPSTOCK-BENT SUB-PDM-DRILL BIT” combination helps in deviating a vertical well and drill the **Building section** of the well profile.
7. Identify the BHA and Formation type (Hard/Soft/Medium) from the following diagram:-



## Part C

(1 Q x 5 M= 05 Marks)

8. Some XYZ proposes to start experimental drilling for crude oil in the bed of the Brahmaputra River, which is one of the longest river in the world connecting China-India-Bangladesh, in Upper Assam by the end of the current year. This would be the first of its kind in the country by XYZ. The company has meanwhile received the necessary environmental clearance from the Ministry. Most corroborating evidence of existence of hydrocarbon reserve in Simen Chapori and the Brahmaputra bed is that Khagorijan in the South Bank in Dibrugarh district, exactly opposite Simen Chapori is a newly found oil field of XYZ. Unfortunately, this 120 KL per day capacity project has been closed as the local residents did not allow to set up an offshore platform as the they think that drilling operation would affect the existence of River Dolphin which is only found is River Ganga and Brahmaputra and further drilling to be done before the Government took adequate measures to prevent the dual menace of flood and erosion in the area. So they have decided to drill an EXTENDED REACH WELL (ERW) from the bank of the river Brahmaputra. The coordinates of the platform and target are as follows:

   Slot coordinate: 15.32 ft. N; 5.06 ft. E  Target coordinate: 2250 ft. N; 6250 ft. E

   The building assembly has a BENT SUB with an offset of 0.015. With this offset angle it can build an angle of 1.5 degree per 100 feet of the well path. The vertical distance between Kick off point to the target is 9000 ft. Calculate,

   (a) Horizontal displacement of the Target
   (b) Inclination angle
   (c) TVD at the end of BUS
   (d) Radius of Curvature
   (e) KOP depth

***FOR ERW, MEASURED DEPTH IS TWICE OF THE HORIZONTAL DISPLACEMENT***