PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 20 %   Max Marks: 20   Max Time: 1 hr.   Tuesday, 25 September, 2018

TEST – 1

Odd Semester 2018-19   Course: **PET 317 Advance Drilling Engineering**   V Sem. Petroleum

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

Part A

(1 Q x 4 M = 04 Marks)

1. Determine the azimuth with respect to true north of the following wells.

Well	Observed bearing w.r.t to magnetic north	Declination
1	N 60° E	5° west
2	S 90° W	1° east

Part B

(2 Q x 4 M = 08 Marks)

2. Describe Type II profile.

3. Define UTM and Lambert projection systems.

Part C

(1 Q x 8 M = 8 Marks)

4. A directional well is to be drilled from an offshore platform to intersect a target whose horizontal displacement is 4200 ft at a true vertical depth of 10,500 ft. A Type 1 profile is to be used with a KOP= 1600 ft and build up rate of 1.5° per 100 ft. Calculate the coordinates of the build and hold profile.

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

TEST 2

Odd Semester: 2018-19

Course Code: PET 317

Course Name: Advanced Drilling Engineering

Branch & Sem: PET & V Sem

Date: 28 November 2018

Time: 1 Hour .

Max Marks: 20

Weightage: 20%

Instructions:

(i)   Read the question properly and answer accordingly.

(ii)   Question paper consists of 3 parts.

(iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **all** the Questions. **Each** question carries **two** marks.   (3x2=6)

1. What is Magnetometer and Accelerometer?

2. List the methods of sending information from downhole to the surface.

3. How does the positive pulse telemetry method differ from negative pulse method?

Part B

Answer the Questions. **Each** question carries **three** marks.   (2x3=6)

4. Describe the Whipstock deflection tool.

5. Explain the Pendulum Assembly with diagram.

Part C

Answer **all** the Question. Each Question carries **four** marks.   (2x4=8)

6. List the applications of directional sensor in MWD tool that may be useful in drilling operations.

7. The diagram below show the result of magnetic single shot survey. Read off the inclination and direction.
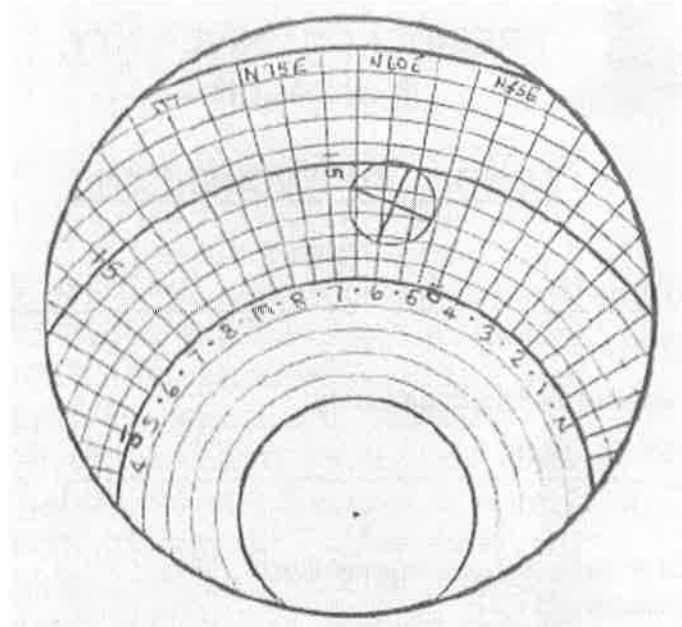
Correct the azimuth by applying the magnetic declination in the following areas:
(i) Gulf of Mexico, declination = 7° East.
(ii) Offshore Canada, declination = 26° West.

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

END TERM FINAL EXAMINATION

Odd Semester: 2018-19   **Date**: 29 December 2018

Course Code: PET 317   **Time**: 2 Hours

Course Name: Advanced Drilling Engineering   **Max Marks**: 40

Programme & Sem: PET & V Sem   **Weightage**: 40%

Instructions:

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

Part A

Answer **all** the Questions. **Each** question carries **three** marks.   (4Qx3M=12)

1. Write the assumptions, equations and limitations of tangential method of survey calculations.
2. What are the factors that may deflect bit away from the planned well path?
3. Define Dogleg. How it can be detected? How can it be quantified?
4. A horizontal drainhole must be drilled to locate a target 500ft from the rig at a depth of 10500 ft (TVD). A build rate of 1.8° per ft can be achieved using a special bottom hole assembly. Calculate:

    (i) the depth of the kick off point

    (ii) the length of the horizontal section

    (iii) the total measured depth of the target.

Part B

Answer **both** the Questions. **Each** question carries **four** marks.   (2Qx4M=08)

5. The drill string becomes struck while drilling a directional well. The driller reports that he can still circulate, but cannot rotate or reciprocate the pipe.

    (i) What is the most likely cause of the stuck pipe?

    (ii) Describe the cause.

    (iii) What action should the driller take to free the pipe?

6. Discuss any four main applications of horizontal drilling for offshore developments with neat diagrams.

Part C

Answer **both** the Questions. **Each** question carries **ten** marks.   (2Qx10M=20)

7) The following extract is taken from a survey report. The target bearing is 95°. Calculate the coordinates of the last three survey station using the average angle method. Calculate the dog leg severity of the last three survey stations.

No	MD (ft)	Inclination (degree)	Azimuth (degree)	Northing (ft)	Easting (ft)	TVD (ft)	DLS
15	6000	20	87	10	800	5900	
16	6093	22	91				
17	6186	23.5	96				
18	6279	26	111				

8. a) How can differential sticking problem be solved?

   b) A dogleg is expected at a depth of 6500ft. A string of 5in OD and 4.125 in ID, 19.7 lb/ft, grade E drill pipe is being used. If the tensile load below this point is 235,000 lb and Modulus of Elasticity is 30 × 106 psi, Calculate the maximum dog-leg that can be allowed.

   c) In a directional well, the maximum dog leg severity is 4° per 100ft. For a tensile load of 100,000 lb, what is the maximum side force that can be tolerated to prevent tool joint failure?