Seat No: _____ Enrollment No: _____

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

B.Tech. Summer 2022- 23 Examination

Semester:4th **Date:22 -3 2023**

Subject Code: 203120253 **Time: 2:00 pm to 4: 30 pm**

Subject Name: Drilling Engineering-II **Total Marks: 60**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (Fill in the blanks, one word answer, MCQ-not more than Five in case of MCQ) (All are compulsory) (Each of one mark) **(15)**

1 In early days, the wells were mostly drilled in one direction which is in _____.

A. Horizontal axis

B. No need to drill

C. Vertical axis

D. None of the above

2. _____ is the angle that occurs where the inclination of the borehole is held constant.

A. Constant angle

B. Stop angle

C. Hold angle

D. None of the above

3. _____ is difficult and less successful in horizontal drilling.

A. Fishing

B. Perforation

C. Fracturing

D. None of the above

4. Which of the following is not a directional well profile

A. S

B. J

C. H

D. Both S and J

5. The point from which deviation of well bore starts known as

A. North point

B.Kick off point

C.Inclination point

D.off set

6. The _____ is indicated by a scribe line marked on the inside of the bend in the sub

7. The stator had _____ more lobe than the rotor

8. no of cavities will _____ speed of rotation
9. Azimuth of well having S30.94E _____
10. Dogleg severity (DLS) is a normalized estimation, normally described in degrees per _____meter
11. What do you mean by Inclination?
12. What do you mean by Extended reach drilling ?
13. How do you define Magnetic north direction
14. Draw S85^{0}E in azimuth diagram
15. How do you define Mechanical sticking?

Q.2 Answer the following questions. (Attempt any three) **(15)**

A) For Following data. Calculate Dogleg Severity

Survey 1	**Survey 2**
Depth = 7500 ft	Depth = 7595 ft
Inclination = 45 degree	Inclination = 52 degree
Azimuth = 130degree	Azimuth = 139 degree

B) What do you mean by Whip-stock techniques for deflection? Write down various types of Whip stock tools?
C) What do you mean by Kick? Write primary and secondary indicators of kick (each four)
D)Describe any two mentioned below
1. Differential Sticking
2. Packed hole Assembly
3. Motor Stalling

Q.3 A) What do you mean by One circulation method? Describe the phases of method with graph **(07)**

B) What do you mean by directional surveying? Describe acid bottle test for directional surveying With Diagram. **(08)**

OR

B) List four methods of sending information from downhole to surface, outlining the main advantages and disadvantages of each. **(08)**

Q.4 A) In a single-lobe motor (1/2 configuration) the rotor diameter is 1.5 in. the eccentricity is 1.5 in. and the rotor pitch is 20 in. At a flow rate of 500 gpm the total pressure drop through the motor is 450 psi. If the motor efficiency is 85%, calculate: **(07)**
(a) the rotational speed;
(b) the torque developed by the motor;
(c) The power output.

OR

A) From the manufacturer's specifications a 3-stage, single-lobe motor has a rotor diameter of 5 in, eccentricity 1.5 in. and a rotor pitch of 70 in. The available torque is 6000 ft lb. Calculate the pressure drop per stage in the motor. **(07)**

B) In Asal, the plan is to drill under the Lava Lake to the locations designated as the four targets. For these wells, a build-and-hold trajectory will be used. Horizontal departure to the target zone is 1015 m at a TVD of 2247.2 m. The recommended rate of build is 3°/30 m. The kick-off depth is 350 m. We have to determine (1) the radius of curvature, R; (2) the maximum inclination angle, θ; (3) the measured depth to the end of the build; (4) the total depth measured; (5) the horizontal departure to the end of the build. **(08)**