

Student Name: .....

Student Number: .....

**Question 1:**

- A. Mention the types of Ram preventers and explain one. (5 points)
- B. Determine the fuel cost (in \$/d) to run an engine at 1,800 rpm with 3,000 ft-lbs output torque. The engine efficiency at the aforementioned rotary speed is 30%. You are also given the following data:
- Diesel oil:
    - Cost = \$1.05/gal
    - Weight = 7.14 lbs/gal
  - Heating value = 19,000 BTU/lb (10 points)

**Question 2:**

- A. What are the functions of Drilling mud? (5 points)
- B. Define Underbalanced drilling. (5 points)
- C. What line pull is required to handle a 370,040 lb casing load with 8 lines strung (5 points)

Number of Lines	Efficiency Factor
6	0.874
8	0.841
10	0.81
12	0.77
14	0.74

**Question 3:** (10 points)

A rotary rig that can handle triples is equipped with 1,200 hp drawworks. The efficiency of the hoisting system is 81%. Determine the travelling block velocity when the hook load is 300,000 lbs.

**Question 4:**

(10 points)

Determine the surface pressure requirement for each of the following maximum pressure gradients. Knowing that the length of the well is 18,000 ft., drill collar length is 2000 ft. and the surface connections equivalent drill pipe length is 700 ft.

$$\Delta P_{fs} = 0.1 \text{ psi/ft}$$

$$\Delta P_{fdb} = 0.1 \text{ psi/ft}$$

$$\Delta P_{fdc} = 0.3 \text{ psi/ft}$$

$$\Delta P_{fadp} = 0.01 \text{ psi/ft}$$

$$\Delta P_{fadc} = 0.07 \text{ psi/ft}$$

$$P_b = 2,430 \text{ psi}$$

**Question 5:**

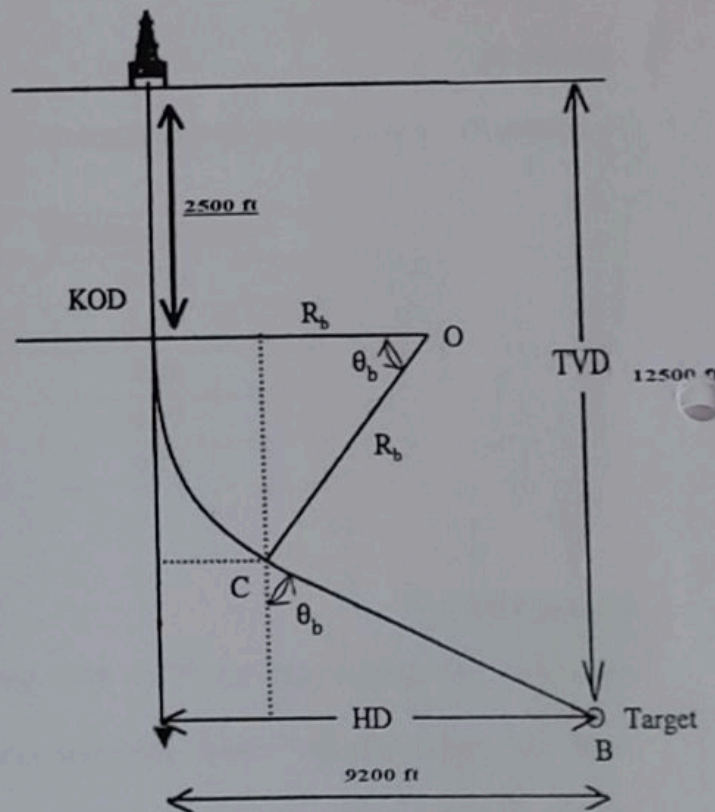
(10 points)

You are given the following data for a build-and-hold pattern-type well:

$$\text{B.R.A} = 3^\circ/100 \text{ ft}$$

Maximum hole angle inclination =  $45^\circ$ .

Determine the total measured depth (TMD).



-Good Luck-