FACULTY OF ENGINEERING

END OF SEMESTER EXAMINATIONS - APRIL 2025

PROGRAMME: BACHELOR OF PETROLEUM ENGINEERING

YEAR/SEM: YEAR 2/SEMESTER 2

COURSE CODE: PTE2211

NAME: WELL ENGINEERING

DATE: 2025-04-14

TIME: 9:00AM-12:00PM

INSTRUCTIONS TO CANDIDATES:

1. Read the instructions very carefully

2. The time allowed for this examination is STRICTLY three hours

3. Read each question carefully before you attempt and allocate your time equally between all the Sections

4. Write clearly and legibly. Illegible handwriting cannot be marked

5. Number the questions you have attempted

6. Use of appropriate workplace examples to illustrate your answers will earn you bonus marks

7. Any examination malpractice detected will lead to automatic disqualification.

DO NOT WRITE ANYTHING ON THE QUESTION PAPER

Section A Answer any two (2)Questions

Question 1:

(a) Describe the problems which constitute a hazard to drilling
   (b) Discuss how the each of the above problem can be solved
    (c) Describe the different kick detection techniques

Question 2:

(a) Write short notes on the following
   i.   Single Completions
   ii.   Double completions
   iii.   Multiple completions
   iv.   Burst load
   v.   Collapse
  (b) Describe the process of running the tubing

Question 3:

(a)Draw a sketch diagram of a completed/ oil producing well
    (b) Write short note on Horizontal well completion
    (c) Discuss the different horizontal well completion options

Question 4:

(a) What do you understand by term well completion?
    (b) Completion process is divided into a number of key areas; Fluids that will fill the well bore
    during completion, Specification on how formation fluids will flow into well bore and design
    of completion fluid. Write short notes on each
    (c) Discuss the key factors that influence the completion design

Section B Answer any three (3) questions

Question 1:

(a) Write short notes on intelligent well completions
    (b)Describe the key features of intelligent well completions
    (c) Discuss the benefits of using intelligent well completions

Question 2:

1. (a) A well has a 12000ft tubing string of $3\frac{1}{2}$ ins diameter. It is calculated that the maximum
collapse force acting on the tubing will be 10500 psi. The maximum bursting force to which the
tubing will be subjected is calculated to be 12000 psi. During a well repair job it will be necessary
to pull 80000 Ibs more than the weight of the string to release the tubing from a downhole tool.
Using the tubing table determine the most suitable weight and the grade of the tubing for this well

The table gives the specifications for 3½ in nominal size tubing.

Actual OD (in)	Nominal Wt (lb/ft)	Grade	Collapse Resistance (psi)	Internal Yield Pressure (psi)	Joint Yield Strength (lb)
3500	7.70	c75	6690	8100	122010
3500	9.20	c75	8530	9520	149140
3500	10.20	c75	9660	10840	173530
3500	12.70	c75	12200	14060	230990
3500	7.70	N80	7080	8640	130140
3500	9.20	N80	10160	10160	159090
3500	10.20	N80	10230	11560	185100
3500	12.70	N80	12920	15000	246390

(b) Why is the tubing necessary in a well?
(c) Discuss the factors that influence the tubing selection

Question 3:

Use sketches to describe at least 5 examples of the well tubing accessories. Give the main function of each

Question 4:

ï»¿ (a) Write short notes on perforation process
(b) Discuss the factors that affect perforation results
(c) Should the production tubing be installed before or after perforation, why?