FACULTY OF ENGINEERING

END OF SEMESTER EXAMINATIONS - APRIL 2025

PROGRAMME: BACHELOR OF PETROLEUM ENGINEERING

YEAR/SEM: YEAR 3/SEMESTER 2

COURSE CODE: PTE3261

NAME: PETROLEUM ECONOMICS

DATE: 2025-04-24

TIME: 2:00-5:00PM

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 - This section comprises 4 questions, each for 20 marks - Answer any THREE questions for full marks - The marks for every question is indicated

Question 1:

4. £200 is invested for 10 years.   Calculate effective annual interest for the following cases:-
    a) Simple interest   @ 5% per year   *[2 marks]*
    b) Compound interest   @ 5% per year   *[2 marks]*
    c) Compound interest   @ 1.57% per month   *[2 marks]*
    d) Mortgage   @   6.99%   nominal   annual   interest   and   monthly compounding   *[6 marks]*
    e) National Savings Capital Bond with increasing interest as follows:-

    Year 1   5.15%
    Year 2   6.10%
    Year 3   7.60%
    Year 4   9.00%
    Year 5   11.00%   *[8 marks]*

Question 2:

(a) With examples, what do you understand by the term "depreciation"   *[5 marks]*

(b) A semi-submersible rig was purchased by an operator at 500 million sterling pounds in the year 1992. Using 25 % declining balance, calculate the expected residual value of the rig in the year 2009.   *[15 marks]*

Question 3:

1. An oil company has 2.1 billion dollars and has a choice between three available opportunities:

    -   Option 1: Deposit the money in a bank account to earn interest at 5%.
    -    Option 2: Use the money to buy a semi-submersible rig and rent it to another company which will pay out $ 250 million per year for 10 years, starting in one year's time. On receipt, the proceeds of this investment can be deposited in the bank.
    -    Option 3: Invest the money in another oil company, which undertakes to repay a lump sum of $ 3.5 billion in 10 years.
                                           [20 marks]

Question 4:

4. £200 is invested for 10 years. Compute terminal value for the following interest schemes:-
    a) Simple interest   @ 5% per year   *[4 marks]*
    b) Compound interest   @ 5 % per year   *[4 marks]*
    c) Compound interest   @ 0.5% per month   *[4 marks]*
    d) Compound interest   @ 7% nominal annual interest and daily compounding   *[8 marks]*

Section B - This section comprises 4 questions, each for 20 marks - Answer any TWO questions for full marks - The marks for every question is indicated

Question 1:

(a) Account for all the features of cash flow model   *[10 marks]*

(b) There are two methods used to perform cash flow shifting, namely; cumulative method and direct method. With illustration, write short notes on each of these cash flow shifting methods.   *[10 marks]*

Question 2:

1. (a) Companies have access to two types of money or capital, namely "equity" and "debt", provide short notes on these two types of capital   *[10 marks]*
2. (b) Discuss the following compilation methods of cash flow models

      i. Money of the day   *[5 marks]*
      ii. Real terms   *[5 marks]*

Question 3:

1. (a) Discuss on details all the characteristics of cash flow   *[10 marks]*
2. (b) Briefly account for ANY TWO of the following type of cash flows
3.   i. OPEX   *[5 marks]*
4.   ii. CAPEX   *[5 marks]*
      iii. Taxation   *[5 marks]*
      iv. Revenue   *[5 marks]*

Question 4:

1. (a) Briefly describe the term asset as applied in petroleum economic and outline any five types of assets that a service oil company can have   *[10 marks]*

   (b) With the aid of a neat diagram, discuss the concept of Monopoly   *[10 marks]*