



KISII UNIVERSITY
UNIVERSITY EXAMINATIONS

**THIRD YEAR EXAMINATION FOR THE AWARD OF
THE DEGREE OF BACHELOR OF PETROLEUM CHEMISTRY
SECOND SEMESTER 2021/2022
(FEBRUARY-JUNE, 2022)**

BSPC 327: WELL LOG FORMATION AND EVALUATION

STREAM: Y3 S2

TIME: 2 HOURS

DAY: FRIDAY, 12.00 PM – 2.00 PM

DATE: 27/05/2022

INSTRUCTIONS:

- 1. Do not write anything on this question paper.***
- 2 Answer question ONE and any other TWO questions***

QUESTION ONE (40MKS)

- a) As a petroleum chemist briefly explain five factors that you would consider in assessing the volume of hydrocarbons in place prior to drilling. [10 marks]
- b) Describe four basic properties of a reservoir rock. [8 marks]
- c) Give four causes of wellbore irregularities during logging. [4 marks]
- d) State the Darcy's law equation and explain each parameter used.

[6marks]

- e) Differentiate between effective porosity and connected porosity. [3 marks]
- f) Describe the emplacement of hydrocarbons in a reservoir rock. [3 marks]
- g) State three factors that affect the permeability of a reservoir rock. [3 marks]
- h) Calculate the recoverable resources in a reservoir of 1 square mile (640 acres), that has an oil column 200ft thick, has a porosity of 15%, a S_w of 10% and a B_o of 1.8 contains. [3 marks]

QUESTION TWO (15MKS)

- a) State the fundamental uses of well logs. [4 marks]
- b) Explain the following processes. [8 marks]
 - i. Whole cores
 - ii. Conventional core analysis
- c) State three parameters that can be analysed from special core analysis [3 marks]

QUESTION THREE (15Marks)

- a) Explain the following types of logs and their applications
 - i) Gamma ray logs
 - ii) Density Logs

QUESTION THREE (15Marks)

- a) Outline the objectives of qualitative interpretation of wireline logs. [4 marks]
- b) Describe sonic logs [6 marks]
- c) Give five applications of sonic logs [5 marks]