INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

HIGHER EDUCATION CERTIFICATE

END OF SEMESTER EXAMINATIONS - APRIL 2025

PROGRAMME: HEC
YEAR/SEM: YEAR 1/SEMESTER 2
COURSE CODE: FDN 1205
NAME: INTRODUCTION TO ENGINEERING SCIENCE

DATE:
TIME:

INSTRUCTIONS TO CANDIDATES:

SECTION A

Attempt ALL Questions (Each question carries 4 marks)

Question 1:

Differentiate between an Engineer and a scientist

Question 2:

Petroleum is a mixture of a number of contents. Briefly explain at least two contents of petroleum

Question 3:

Outline four steps that have to be undertaken before you become a qualified Engineer

Question 4:

Briefly explain four specialization areas that a student pursuing petroleum engineering can specialize on.

Question 5:

A good Engineer should demonstrate a number of competencies. Briefly explain at least four competencies a qualified Engineer should exhibit

Question 6:

a) Define pollution

b) Outline at least four ways of controlling pollution

Question 7:

Explain briefly how use of public transport in cities can control pollution

Question 8:

Constructions as a whole are made my man, are used by man and are placed in the environment under the influence of natural factors. Give decisive factors that influence the way constructions are planned.

Question 9:

Briefly explain at least four challenges faced by Engineers in the 21st century

Question 10:

Identify at least four types of cement that are common on construction sites in your country

Question 11:

Explain briefly four contributions made by chemical Engineers in our communities

Question 12:

Identify categories of Petroleum Supply chain in the petroleum industry

Question 13:

A good Engineer should at least demonstrate some computer skills in the 21st century. Identify at least four areas where computer is vital in the Engineering world.

Question 14:

Briefly explain three areas a student pursuing computer Engineering can specialize in

Question 15:

As a science, architecture has suffered over time substantial transformations and completions. Give at least two reasons responsible for the transformations.

Question 16:

In most countries around the world use of plastic bags is so much prohibited. Briefly explain why the plastic bags are so much discouraged in our environment

Question 17:

a) Define concrete

b) Give four ways of curing concrete at the construction site

Question 18:

a) How many liters of oil are in one Barrel of oil?

b) Convert the following from Barrels to liters

i) 88 million barrels

ii) 87 million Barrels

Question 19:

Identify three ways how rocks can be carefully investigated during oil discovery

Question 20:

Identify at least four career opportunities for petroleum Engineers

SECTION B

Attempt any three (Each question carries 20 marks)

Question 1:

Civil engineering can be broken down into a number of disciplines/ fields/specializations. Mention at least 10 disciplines, stating clearly what each is concerned with

Question 2:

Other than aeronautic Engineering, mention Five (5) Engineering disciplines relevant to the development of your country that youngsters like you can pursue mentioning briefly the sort of problems that engineers in the mentioned discipline solve. Please list only those that your country needs

b) Mention and describe 5 engineering challenges that engineers are facing around the world today. Use not more three lines for each.

Question 3:

Define electrical engineering?

b) Briefly explain at least 5 ways in which Electrical Engineers are Important to Society.

C) Define the following terms as used in construction

i) Brick

ii) Stone

iii) Cement

Iv) Mortar

Question 4:

Define the term computer engineering

(2 marks)

(b) Explain the main three categories of computer engineering

(c) As an engineering student, explain six ways how computers are useful in engineering discipline

Question 5:

Any engineer or engineering student that jokes with his or her safety is like joking with his or her entire life. In not more than five(5) points each, briefly explain how safety should be exercised in the following;

(a) Fire safety

(b) Construction and Site safety

(c) Chemical Safety

(d) Electrical safety

Question 6:

Take one product from your engineering domain and explain about the following aspects

a) its use in solving societal problems

b) How users' centric design is made

c) Impact on environment, safety and health

Question 7:

1. Write brief notes on the following Engineering disciplines
    a) Mechanical Engineering
    b) Computer Engineering
    c) Petroleum Engineering
    d) Civil Engineering
    e) Electrical Engineering

Question 8:

A) Define who petroleum engineers are and what petroleum engineers do
B) Briefly describe 3 categories of petroleum engineers stating clearly how the role of one differ from those of the rest.

D) Since Oil is a non-renewable resource, how would you advise your government to use it sustainably?

Question 9:

Stones used for civil engineering works may be classified in the following four ways:
a) Geological

b) Physical

c) Chemical

d) Practical

Briefly explain the above categories

Question 10:

In most African countries there is a short fall of good engineers due to brain drain. As an engineering student at IUEA, in not more than

10 points briefly explain what your country should do in order to train, maintain and attract good Engineer