LANDMARK UNIVERSITY, OMU-ARAN

COLLEGE OF ENGINEERING
MECHANICAL ENGINEERING DEPARTMENT
2021/2022 ALPHA SEMESTER EXAMINATIONS

COURSE CODE: GEC 216 COURSE TITLE: GENERAL ENGINEERING LABORATORY I
COURSE UNIT: 3 TIME: 2 HOURS 30 MINS
INSTRUCTION(S): ANSWER ONE QUESTION FROM EACH SECTION

SECTION A- AGRIC AND BIOSYSTEM ENGINEERING

1. (a) What is hazard and what are the categories of hazard? (3 Marks)
   (b) State reasons why a fire extinguisher is kept close to a doorway and explain how to get rid of fire using extinguisher. (2 Marks)
   (c) Distinguish between the following: i. waste basket and waste carton ii. testing and measuring equipment iii. wet and dry laboratory (3 Marks)
   (d) As a laboratory user, why should you never work alone in the laboratory? (1 Mark)
   (e) The activities in the laboratory revolve around three things. What are they? (1 Mark)

2. (a) What are the relevancies of sand bucket in the laboratory? (1.5 Marks)
   (b) Every laboratory deserves some ventilating chamber. Why is it important to install such? 1.5 Marks)
   (c) Fire does not exist without some ingredients. Describe them. (2 Marks)
   (d) Before commencing any operation in any laboratory, what must you do first? (1 Mark)
   (e) Fire exists and occurs in different forms. How would you classify it with explanatory examples? (4 Marks)

SECTION B-CHEMICAL ENGINEERING

1. (a). Write short notes on the following
   (i) Laboratory
   (ii) Quality Control (2 Marks)
   (iii) Quality Assurance (2 Marks)
   (b). (i) State any five essential feature of a well-designed laboratory (2 Marks)
   (ii) List five unit operation techniques applied in Chemical Engineering practice (2 Marks)

2. (a).With the aid of a diagram explain the types of benching arrangement in a well-designed laboratory (2 Marks)
   (b). State the factors that determine the choice of laboratory floor covering (2.5 Marks)
   (c). List five types of floor covering suitable for a well-designed laboratory (2.5 Marks)
   (d). Recommend a suitable flooring type for the following laboratory (2.5 Marks)
   (i). Chemistry laboratory
   (ii). Physics laboratory
   (iii). Biology laboratory
   (iv). Engineering workshop
   (v). Chemical/tools store

SECTION C- CIVIL ENGINEERING

1. (a) List two (2) types of Cement. (2 Marks)
   (b) List two (2) grades of Cement. (2 Marks)
   (c) Draw a Hand trowel and label its parts. (2 Marks)
   (d) Explain ratio 1:2:4 and ratio 1:3:6 according to concrete mix ratio. (2 Marks)
   (e) Define "Mortar" in Civil Engineering. (2 Marks)

2. (a) Define Concrete. (2 Marks)
   (b) State the meaning of "bonding" in Civil Engineering. (2 Marks)
   (c) List two (2) types of bonds. (2 Marks)
   (d) Briefly explain fine aggregate and coarse aggregate. (2 Marks)
   (e) Draw any type of bond. (2 Marks)

SECTION D- ELECTRICAL ENGINEERING

1. a. What is the code of resistor having the following colors?
   i. orange, yellow, blue and gold
   ii. Brown, red, silver, and Red
   iii. Yellow, blue, gold, and silver
   iv. Brown, white, red, blue (4 Marks)

   b. A resistor is connected across a 50 V source. What is the current in the resistor if the color code is red, orange, orange, silver? (3 Marks)

   c. Determine the value of the following resistor

224	R1	100

(3 Marks)

2a. Approximately how many milliamperes of current flow through a circuit with a 40 V source and resistance of colour code BLUE, GRAY, RED, GOLD? (3 Marks)

b. what is the value of resistor having the following colour codes

i. White black green blue
ii. Red purple red red
iii. Orange black black purple
iv. Brown black blue no colour (4 Marks)

c. Determine the value of the following resistors. (3 Marks)

105	1R0	22R0

Black	0	10^0	–
Brown	1	10^1	1%
R	2	10^2	2%
O	3	10^3	–
Y	4	10^4	–
G	5	10^5	0.5%
B	6	10^6	0.25%
Purple	7	10^7	0.1%
Grey	8	10^8	–
White	9	10^9	–
Gold	–	10^{-1}	5%
Silver	–	10^{-2}	10%

SECTION E-MECHANICAL ENGINEERING

1. (a) Mention the experimental title of the practical conducted this Alpha Semester in the Mechanics of Machine Laboratory. (1 Mark)
   (b) Give one associated objective with the said experiment in (a) above. (1 Mark)
   (c) What shape of belt was used to perform the experiment? (1 Mark)
   (d) Name the tensions, with their symbols, found in the belt used for the experiment. (2 Marks)
   (e) Itemize the steps/format to be followed in writing a laboratory report. (5 Marks)

2. (a) Give the title of the experiment conducted in the strength of material and material testing Laboratory. (2 Marks)
   (b) Mention two areas of application of the above experiment in question (a). (2 Marks)
   (c) In a sentence, what is the function of a dial indicator in the experiment in question (a)? (2 Marks)
   (d) Define Beam compliance. (2 Marks)
   (e) Mention two precautions taken while carrying out the experiment? (2 Marks)