20

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

FIRST YEAR FIRST SEMESTER EXAMINATIONS
SUPPLEMENTARY/SPECIAL EXAMINATION

FOR THE DIPLOMA IN:
GENERAL AGRICULTURE

COURSE CODE: DAG 052

COURSE TITLE:GENERAL PHYSICS

DATE: 29.7.22 **TIME: 11-1PM**

INSTRUCTIONS TO CANDIDATES

Answer ALL questions in section A and any TWO in section B

SECTION A: Answer all questions (30 Marks)

a) State the three basic unit of measurement, S. I units and symbols. (6 marks)

b) Define the following terms

i. density. (1 mark)

ii. matter (1 mark)

iii. Pressure (1 mark)

iv. Elasticity . (1 mark)

c) A force of 525N produces a moment of force of 420Nm, calculate the shortest distance between the point of application of force and the turning point. (2 marks)

d) Name any three properties of materials to be considered when classifying them under various types of stress. (3 marks)

e) A block of glass of mass 187.5g is 5.0cm long, 2.0cm thick and 7.5cm high. Calculate the density of the glass in kgm^{-3}. (3 marks)

f) A wheel of radius 50 cm is rolled through a quarter turn. Calculate

(i) The angle rotated in radians. (2 marks)

(ii) The distance moved by a point on the circumference. (2 marks)

(g) State any four effects of a force. (4 marks)

(h) State any two types of collision. (2 marks)

(i) A body is brought to rest from 150km/h in 30 seconds. What is its retardation? (2 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20MKS)

a) State Newton's law of motion (3 marks)

b) (i) define the term momentum. (1 mark)

(ii) A body of mass 1500kg moves with a velocity of 50km/h. calculate its momentum. (3 marks)

c) State the three factors that affect pressure in liquids. (3 marks)

d) The density of mercury is $23600kgm^{-3}$. Determine the liquid pressure at a point 100cm below the surface of mercury. (Take g=9.81N/kg) (3 marks)

e) Name any three factors affecting centripetal force. (3 marks)

f) A 0.5 kg mass is tied to a string 1.0m and whirled in space in a horizontal circular path at a rate of $10.0ms^{-1}$. what centripetal force does the string exert on the mass? (3 marks)

g) Explain why the cutting edge of aknife is made sharper. (1 mark)

QUESTION THREE (20MKS)

a) Diffeerentiate between a scalar and a vector quantity. (1 mark)

b) Sketch distance time graphs of the following bodies

(1) Stationary body (2 marks)

(2) a body moving with uniform speed (2 marks)

(3) a body moving with variable speed (2 marks)

(c) A 900kg race car makes one lap around a track of radius 50.0m in 11.0s.

(1) what is the car's average speed? (2 marks)

(2) what is the car's angular velocity? (2 marks)

(3) what is the centripetal force acting on the car? (2 marks)

(d) (i) Name two conditions of equilibrium of a body. (1 mark)

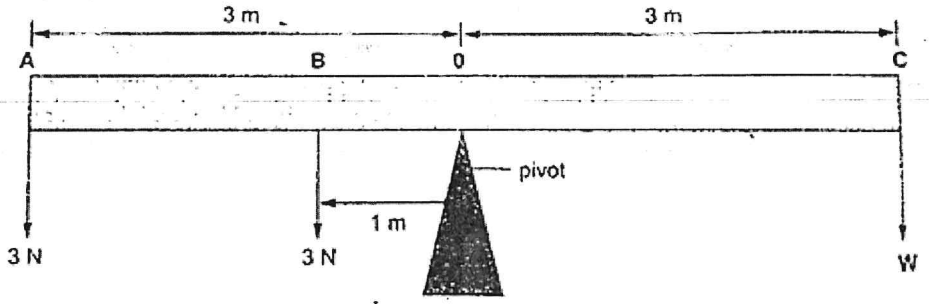
(ii)explain the three states of stability. (6 marks)

QESTION FOUR (20MKS)

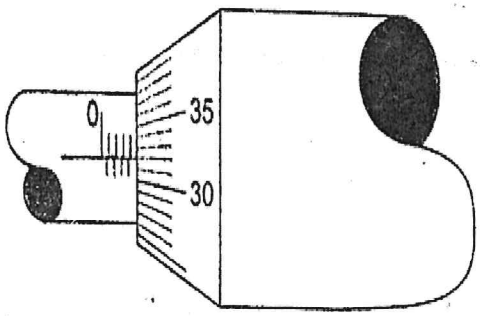
a) Define force. (1 mark)

b) State the laws of moments. (1 mark)

c) A uniform rod of negligible mass balances when a weight of 3 N is at A, weight of 3 N is at B and a weight of W is at C. What is the value of weight W? (3 marks)



d) Give the reading in the following diagram. (3 marks)



e) State Hooke's law. (1 mark)

f) A load of 6 N causes a certain copper wire to extend by 2.0 mm. Find the load that will cause a 4.0 mm extension on the same wire. (4 marks)

g) A diver is 20 m below the surface of water in a dam. If the density of water is 1,000 kgm^{-3} determine the pressure due to the water on the diver. (Take g = 9.81 Nkg^{-1}) (4 marks)

(g) a body moving with uniform acceleration of 10ms^{-2} covers a distance of 320m. if its initial velocity was 60m/s, calculate its final velocity. (3 marks)