Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
100 Level 2nd Semester Examination -- Dec./Jan. 2017
BGE 131-3 Basic Mathematics and Engineering Technology (Repeat)

Uva Wellassa University

(Part B)

Instructions to candidates
Duration: One(01) hour
Number of questions: Two(02) Essay Questions
Mark allocation: 80
Scientific calculators are allowed
Answer all questions

Acceleration due to gravity g = 9.8 ms^{-2}

1.

a. Name three physical quantities which have both a magnitude and a direction.
(06 marks)

b. If a man walks 500 m to the east and then if he walks 200 m to the west what will be the resultant displacement of this person compared to his starting position ?
(04 marks)

c. What is the SI unit of the velocity ?
(02 marks)

d. If the distance from Badulla to Kandy is 240 km and if a car takes 3 hours to travel this distance what is the average speed of the car ?
(06 marks)

e. What is the relationship between force (F), mass (m) and acceleration (a).
(10 marks)

f. What is the resulting force of the following diagram ?
(04 marks)

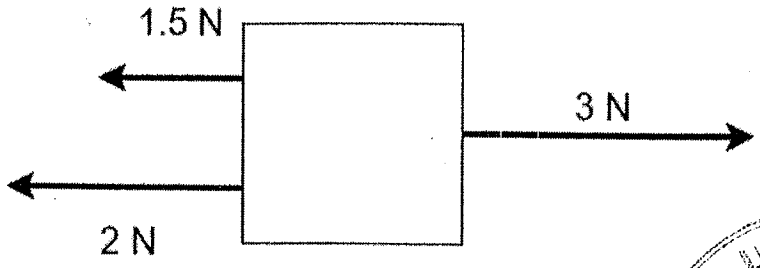

Figure 01

g. A block of mass 10 kg is accelerating at 2 ms^{-2}. What is the magnitude of the resultant force acting on the block ?

(08 marks)

2.

a. Write down an equation for the kinetic energy of an object which has a mass m and which is travelling with velocity v.

(05 marks)

b. If a cart with mass 5 kg is travelling with a velocity of 10 ms^{-1}, what is the kinetic energy of the cart ?

(08 marks)

c. If an object with mass m is situated at a distance h from the ground, write an equation for the potential energy of that object.

(05 marks)

d. If a bird with mass 0.2 kg is on a top of a tree which is 5 m in height, what is the potential energy of the bird?

(08 marks)

e. Write down the relationship among density (ρ), mass (m) and volume (v) of a substance.

(05 marks)

f. If a cube is 4 m in length, 2 m in width and 1 m in height and has a mass of 5 kg, what is the density of the cube ?

(09 marks)