



**RAJARATA UNIVERSITY OF SRI LANKA  
FACULTY OF APPLIED SCIENCES**

B.Sc. (General) Degree in Information and Communication Technology

First Year – Semester I Examination – May / June 2017

**FDN 1203 / CMP 1007 – BASIC SCIENCE FOR NON SCIENCE STUDENTS**

Time: Two (02) hours

Answer all the questions on the paper itself

**INDEX NO: .....**

**(1) (a) i. What is it meant by Science and Technology? Explain with an example.**

**(05 marks)**

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Contd.



ii. The branches of science are commonly divided into four major groups. Name them.

(04 Marks)

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iii. Use an example to describe the Scientific Method as an on going process.

(05 marks)

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(b) i. What is a galaxy?

(02 marks)

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ii. Describe the four types of galaxies characterized by their shape. (04 marks)

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iii. What is a Galactic Centre? (02 marks)

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iv. Use a diagram to describe the top view of the map of the Milky Way. In your diagram show the most probable place for a super massive black hole.

(03 marks)

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(2) (a) State Newton's Laws.

(10 Marks)

i. First Law

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ii. Second Law

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iii. Third Law

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(b) i. What is the acceleration of a cheetah that zips past you at a constant velocity of  $70 \text{ kmh}^{-1}$ ? Substantiate your answer.

(04 Marks)

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Contd.



- ii. In a head-on collision between a compact small hybrid car and a large SUV, what can you say about the magnitude of the force acting on both vehicles? The people in the smaller hybrid car are more likely to get injured than those in the large SUV. Explain the reason assuming that the both cars are equally strong.

(06 Marks)

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- iii. A 10 kg bag of rice weighs one-sixth as much on the moon than on the earth because the moon's gravity is one-sixth as much as that of the earth's. If you tried to throw the bag horizontally across to a friend, is it one-sixth easier on the moon than on the earth? Explain.

(05 Marks)

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- (3) (a) Define the term "atom".

(02 marks)

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- (b) There are three types of sub atomic particles. What are they?

(03 marks)

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Contd.

(c) Molar mass of Ca, C, O, H, P, N are 40, 12, 16, 1, 31 and 14 g mol<sup>-1</sup> respectively.

Determine the molecular weight of the following molecules. (06 Marks)

CaCO<sub>3</sub> .....

H<sub>3</sub>PO<sub>4</sub> .....

CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub> .....

(d) 5 g of CaCO<sub>3</sub> are dissolved in water making 250 ml of solution. Calculate the molar concentration (molarity) of the solution. (07 marks)

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(e) Determine the percentage composition of nitrogen in H<sub>2</sub>NCH<sub>2</sub>CCNH<sub>2</sub>. Molar mass of C, H, N are 12, 1, and 14 g mol<sup>-1</sup> respectively. (07 Marks)

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(4) (a) Using an example for each, explain the following ecological concepts. (15 Marks)

i. Prey predator relationship

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ii. Exponential and logistic growth

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iii. Carrying capacity

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Contd.



(10 Marks)

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**Or**

ii. Hydrological cycle

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