Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
100 level 1st Semester Examination – July/ August 2016
SCT 121-1 Introductory Biology

Uva Wellassa University

Instructions to candidates
Duration: 01hour
Number of questions: 05
Answer all the questions in the given space.
Mark allocation: 100

Index No. [ ]

1.

a. Due to some unique properties, water is considered as a special kind of substance. What is responsible for giving water molecule such unique properties? (4 mark)

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b. Give **two** properties of water which makes it an important biological component. (4 mark)

i. .....

ii. .....

c. Give the **seven phenomena** which differentiate living from nonliving matter. (14 marks)

i. ..... v. .....

ii. ..... vi. .....

iii. ..... vii. .....

iv. .....

d. List the **three main classes** of carbohydrates and circle the class containing macromolecules. (8 mark)

i. .....

ii. .....

iii. .....

15 10

e. You can classify carbohydrates according to their functional groups. What are those **two** groups? (4 mark)

i. ..... ii. .....

f. Which protein structure shows the three dimensional arrangement? (2 mark)

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g. List **two agents** that cause denaturation of proteins. (4 mark)

i. .....

ii. .....

2.

a. What are the **three** major features of a plant cell which distinguishes it from an animal cell? (6 mark)

i. .....

ii. .....

iii. .....

b. What is the main feature to distinguish a prokaryotic cell from an eukaryotic cell? How can you distinguish the prokaryotic and eukaryotic cell using that feature? (4 mark)

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3.

a. i. Distinguish between unicelluar and multicellular organisms. (4 mark)

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ii.Give an example each for unicellular and multicellular organisms. (2 mark)

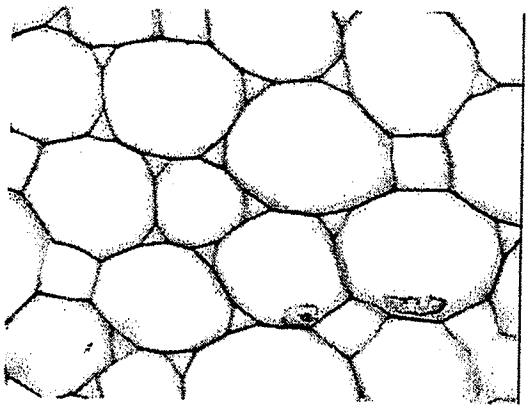
Unicellular - .....

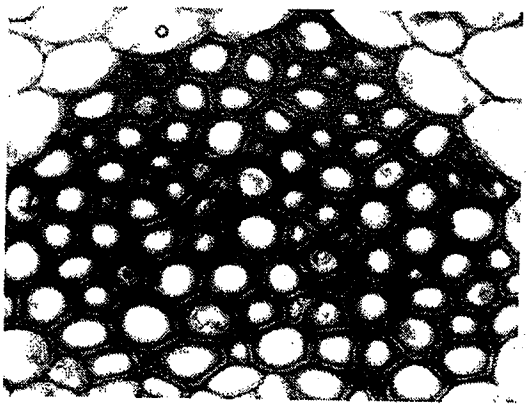
Multicellular - .....

b. Write **four** levels of organization in human body. Give an example for each level you mentioned. (8 mark)

Level	**Example**
i.....	.....
ii	.....
iii	.....
iv	.....

c. Identify following plant tissues (4 mark)





i..... ii.....

4.

a. What is a "population"? (4 mark)

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b. Write **four** factors effect for population growth rate. (4 mark)

i. ..... iii. .....

ii. ..... iv. .....

c. Derive a equation to show population growth rate by using factors mentioned in above 4,b. (4 mark)

d.Calculate the growth rate of bacteriaum, *Escherichia coli* in a culture plate by using following informations. (5 mark)

Inoculated number of cells = 10^2
Number of cells used from the plate for another experiment = 10^3
Number of dead cells counted after 12 hours of incubation = 1.7×10^2
Number of live cells counted after after 12 hours of incubation = 1.5×10^4

e. i. What is a "Competitive Exclusion Principle"? (3 mark)

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ii. Why some of the native endemic species are dissapearing from their own habitat? (2 mark)

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5.

a. Draw diagrams to show chromatin and chromosome. (2 mark)

Chromatin	Chromosome

b. Cell cycle of somatic cells consist of three main stages such as interphase, mytosis and cytokinensis. Give one charecteristic feature of each stage. (3 mark)

i. .....

ii. .....

iii. .....

c. Draw a labelled diagram to show the cell division in prokaryotes. (5 mark)

Part B – Structured Questions

Number of Questions: 09 (Nine)

Answer all

All questions carry equal marks. Total marks :45

Please answer in the given space. Attaching of extra papers are not allowed

1. Describe the formations of oceans in the prehistoric Earth using the Degassing Hypothesis

2. Describe the reasons for Earth's different layers

3. Describe the reasons for the appearance of P-Wave shadow zones

4. What are the evidences that supported the of Alfred Wagener's continental drift hypothesis?

5. What is polar wondering?

6. Describe the formation of a rift valleys with an example

7. Describe the rock cycle <u>without</u> diagrams

8. Under which conditions are brittle and ductile structures formed?

9. Describe the formation of following morphological features (No marks for sketch diagrams)

a. Potholes

b. oxbow lake

c. Loess

d. Sea stack

f. Kettle hole

Part C – Map Work

Answer All questions based on the map given in the page 9

Total: 40 Marks

1.

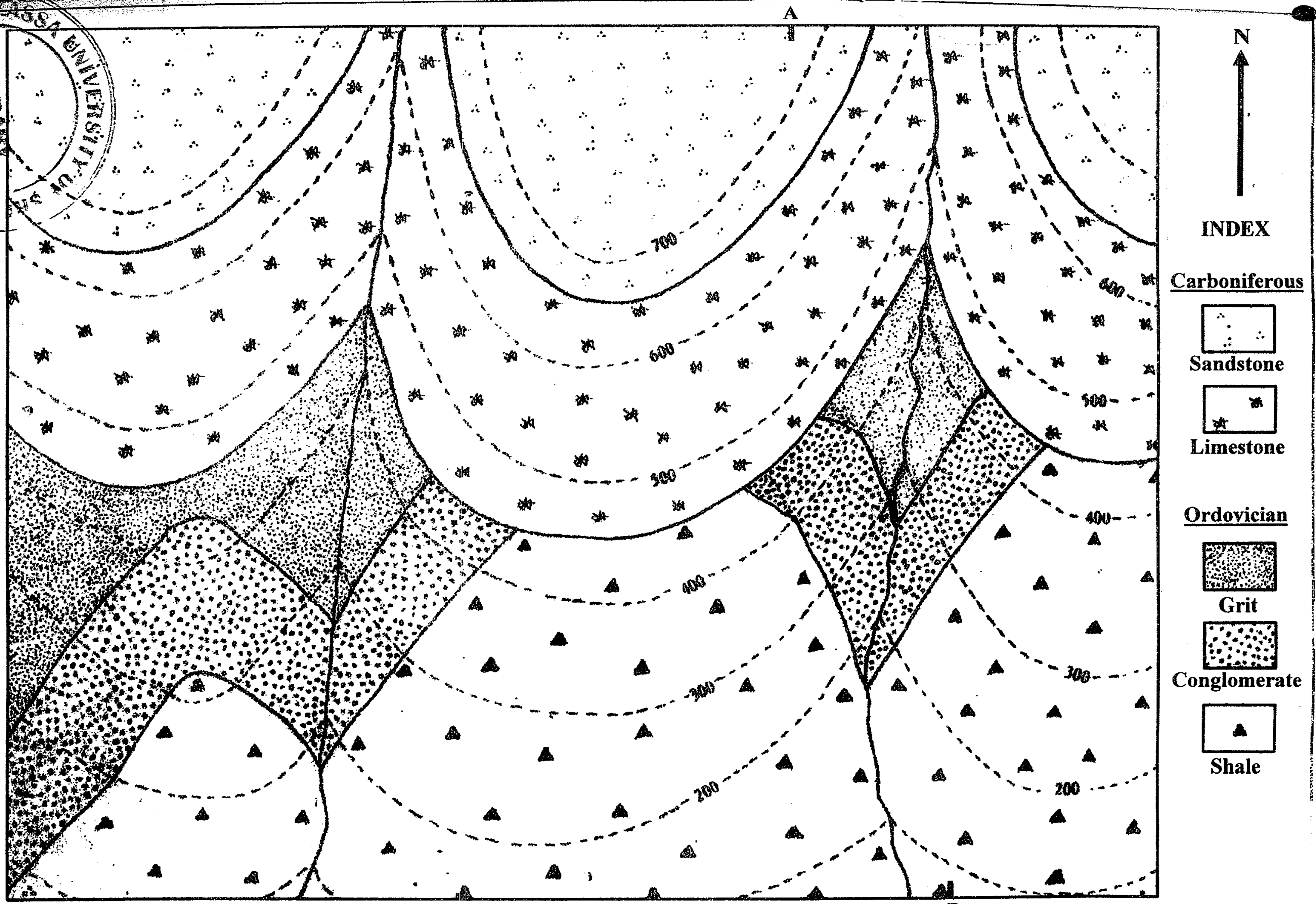
a. Identify the outcrop patterns and colour them accordingly. (5 marks)

b. Complete the AB cross-section with all necessary details on the given graph sheet (20 marks)

2. Calculate the thickness of the beds (10 marks)

3. Explain the geological history of the area (5 marks)

-END-



SCALE – 1 inch = 1000 feet

Part B

Number of questions: Six (06) structured
Mark allocation: 30
Write the correct answer in the space provided

1. Write a complete C program to display "Welcome to C" on the screen. (05 mark)

2. Write a C function that will accept two (02) integer parameters. Multiply them together and store the answer in 'double' type local variable. Finally, function must return the answer. (05 mark)

3. Write a code snippet (not a complete program) to display the values of elements of the following array using a ***while*** loop. (05 mark)

```
myarray[5] = {25, 32, 44, 29, 38}
```

4. Rewrite the following control structure using nested if-else structures. (05 mark)

```
switch(grade){
   case 1:
     printf("Excellent");
   break;
   case 2:
     printf("Good");
   break;
   case 3:
     printf("Average");
   break;
   default:
     printf("Invalid Grade");
   break;
}
```


5. Define an integer array with five (5) elements. Declare an integer pointer to store the address of the first element of the array you defined. Display the value of the third element using the pointer you declared. (05 mark)

ark)

i. Write a C program to calculate and display the weekly wage of an employee. The pay depends on payment per hour (***double rate***) and the number of hours worked (***double hours***). Moreover, if the employee has worked for more than 30 hours then he gets twice the wage per hour (2 x rate) for every extra hour that he has worked (***double overTime***). (05 mark)

Part B

01. Froth flotation is a process for selectively separating hydrophobic materials from hydrophilic.

a. State the convenience of the dense media separation (DMS) over other mineral processing methods. [10 marks]

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b. List out five laboratory heavy liquids with their specific gravities [10 marks]

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c. Describe the Laboratory heavy liquid test of a sand sample that contains Garnet (S.G = 4.0), Ilmenite (S.G= 4.6), Rutile (S.G= 4.2), Zircon (S.G= 4.8) and Quartz (S.G = 2.7)

[15 marks]

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Part C

01. a. State the Stokes's and Newton laws and identify their limitations. [10 marks]

b. Derive an equation for the terminal velocity of a spherical particle of diameter d and density Ds falling under gravity in a viscous fluid (the fluid viscosity = n) of density Df under free-settling conditions using Stokes's law [10 marks]

c. Calculate the settling time of each given diameter size (d) mineral particles in the slurry. [15 marks]

- Particle diameter: 40, 60, 600,1000 microns
- Viscosity of slurry = 1.015 x 10^{-3} Pa.s
- The specific gravity of mineral = 2.65
- Slurry height from bottom to the top level of slurry = 80 mm
- Acceleration of gravity = 9.8 m/s^2

Part B

I.

a. What are the main **four (04)** types of grains? Give **two (02)** examples for each group.

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(04 mark)

b. State the differnece between hard wheat and soft wheat.

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(02 mark)

c. Name **four (04)** quality parametes of grains.

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(02 mark)

d.

i. Define the term "Wet Milling".

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(01 mark)

ii. Write **two (02)** advantages and **two (02)** disadvantages of wet milling.

Advantages

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Disadvantages

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(02 mark)

e. What is meant by conditioning in corn milling?

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(02 mark)

f. What are the information you can find in stack card in grain storage?

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(03 mark)

a. Define "Saponification value".

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(02 mark)

b.

i. What is meant by RDB oil?

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(02 mark)

ii. State the main processes of RDB oil manufacturing.

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(03 mark)

c. What is happening in winterization process ?

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(02 mark)

d. What are the factors that should consider during the selection of coffee beans for the coffee powder production?

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(04 mark)

e. Draw the flow diagram for the coffee manufacturing process.

(06 mark)

Essay Questions

3.

a. Briefly explain the methods of spice preservation. (08 mark)

b. Write short account on spice usage in Sri Lanka. (10 mark)

4.

a. Explain the fresh wet method of vergin coconut oil processing. (08 mark)

b. Briefly explain the benefits of vergin coconut oil compared to the conventional coconut oil. (05 mark)

a. Discribe the processing steps of carbonated beverages. (08 mark)

b. "Recently people are moving towards the natural beverages rather than artificial beverages". Comment on the above statement giving suitable examples. (04 mark)

a. What is meant by rice parboiling? (02 mark)

b. Discuss the advantages and disadvantages of rice parboiling. (10 mark)

Index No: .....

Part B

i. Briefly explain the meaning of mine planning. (2 Marks)

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ii. List out the stages of mine planning and designing process. (5 Marks)

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iii. Under the preliminary study, what are the things that need to be considered before moving to the next level? (5 Marks)

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Index No: .....

iv. At what stage a company should get investment decision? (3 Marks)

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7. i. Define the following and give a brief introduction to each.

a. Direct cost (2 Marks)

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b. Indirect cost (2 Marks)

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c. Sunk Cost (2 Marks)

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d. Capital Cost (2 Marks)

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Index No: .....

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ii. What is cash flow? (5 Marks)

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iii. Assume that Rs 1000 is to be deposited in the bank at the 5 consecutive years. Assuming an interest rate of 10%, calculate the present values. (7 Marks)

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Index No: .....

Part C

1. i. The following table is from a production company. The management has identified the following information about their production line. With the given data fill in the blanks. Clearly mention the steps followed to take the values.

Hint: Output is in 100-unit increments. The table should be read as stating that the marginal cost is 10 for EACH unit between 0 and 100 so that the variable cost is 10$ x 100 units.

(0.75x28 Marks)

Production Units	Marginal Cost ($)	Variable Cost ($)	Fixed Cost ($)	Total Cost ($)	Average Cost ($)
0	---	----	----	6000	---
100	10	----	----	---	---
200	---	2500	----	---	---
300	---	----	----	10,500	---
400	---	----	----	---	36.25
500	---	----	----	---	---
600	70	20,000	----	---	---

2. i. What do you mean by the term "Time value of money"? (2 Marks)

ii. Assume that Rs. 150,000.00 is borrowed from the bank today (time = 0) to purchase a piece of equipment and that a 12.5% interest rate applies. It is intended to repay the loan in equal yearly payments of Rs. 15,000.00. How long will it take to repay the loan? (8 Marks)

iii. Explain the type of depreciation in accounting (4 Marks)

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