

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
FST 1st Year 2nd Semester Final Examination 2010
Subject: Physics-II
Course Code: PHC-102

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Full Marks: 70

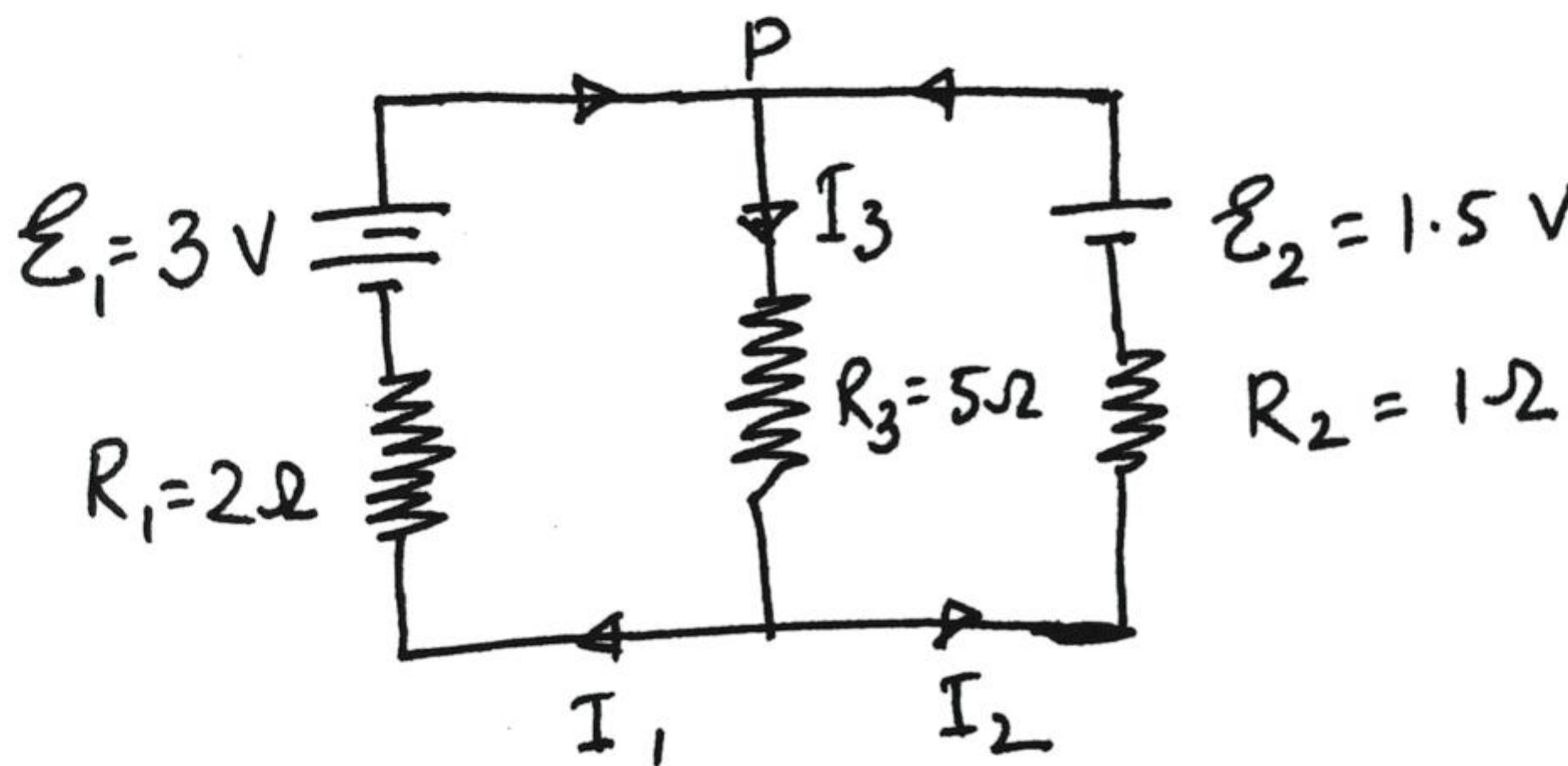
Time: 3 Hours

Figure in the right margin indicate full marks.

(Answer **FOUR** questions from each section where question no. 1 and 6 are compulsory. Use separate answer script for each section)

Section: A

1. What is meant by conservation of charge? Show that $\bar{\Delta} \cdot \bar{J} = -\frac{\partial \rho}{\partial t}$; where the symbols have their usual meanings. 05
2. (a) State and prove Kirchoff's law. 05
 (b) Calculate the current flowing through various branches of the electric circuit as shown in the figure below: 05



3. A series circuit containing an inductor (L) and a resistor (R) is connected to a battery. Obtain the differential equation of the circuit. Hence discuss the growth and decay of current in this circuit. 10
4. (a) State and Explain Lenz's law of electromagnetic induction. 04
 (b) Deduce the differential form of Faraday's law. 06
5. (a) What is meant by magnetic intensity, susceptibility and permeability? 03
 (b) What are para, dia and ferromagnetic substance? 03
 (c) Establish the relation $\bar{B} = \mu_0 (\bar{H} + \bar{I})$; where the symbols have their usual meanings. 04

Section: B

6. What do you mean by a perfectly black body? Describe an approximate perfectly black body. 05

P.T.O.

7. (a) State and explain Stefan's law of radiation. Derive this law using thermodynamic relations. 08
(b) Calculate the radiant emittance of a black body at a temperature of i) 400 K and ii) 4000 K. [$\sigma = 5.672 \times 10^{-8}$ S.I units.] 02
8. Describe the Michelson-Morley experiment. What are the important results of this Experiment? 10
9. (a) Derive the Lorentz transformation equation in relativistic mechanics. 08
(b) At what speed is a particle moving if the mass is equal to three times its rest mass? 02
10. Give the theory of successive disintegration of radioactive substance. Explain what is radioactive equilibrium? 10

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Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
FST 1st Year 2nd Semester Final Examination-2010
Subject: Biochemistry-I
Course Code: BCM-102

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Full Marks: 70

Time: 3 Hours

Figure in the right margin indicate full marks.

(Answer **THREE** questions from each section where question no. **1** and **5** are compulsory. Use separate answer script for each section)

Section: A

1. a) What do you mean by term asymmetric carbon atom? How many isomers can be possible for mannose? 2
- b) Write down the structure of milk sugar and table sugar. 2
- c) What do you mean by reducing sugar? Give two characteristic reactions of reducing sugar. 4
- d) What are anomers and epimers? Write down the Haworth structure of β -D-galactopyranose and its anomer. 3
2. a) Why proximity and orientation of the substrate is important for catalytic efficiency of an enzyme? 3
- b) Write down the distinguishing points for the following pairs. 3
- i. Holoenzyme and Apoenzyme.
- ii. Co-enzyme and prosthetic group.
- c) Write down the name of specific enzymes that are derived from B-complex vitamin. 3
- d) Define enzyme regulation. Briefly describe the enzyme regulation in the context of allosteric control. 3
3. a) Which amino acids are dietary essential for infant ? 2
- b) Give the structure of hydroxyl group containing amino acid. 2
- c) Write down the transamination and decarboxylation reactions of amino acid. 4
- d) Write down the structure sanger's reagent. What is the use of it in protein chemistry? 4
4. a) What is vitamin? In human body which vitamins are naturally synthesized in intestine? 2
- b) Write down the biochemical function of vitamin C, niacin & vitamin B₆. 6
- c) What is k_m ? How could an enzyme be induced or repressed? Explain with examples. 4

Section: B

5. a) Define enzyme. Write down the modern classification of enzyme along with examples. 3
- b) How an enzyme acts on a substrate according to Fischer's template theory and Koshland's model? 4
- c) Explain the temperature, pH and substrate concentration on enzyme activity. 4
6. a) Why vitamin D is called hormone also? Justify your answer. 3
- b) Write down the structural and biochemical function of fat soluble vitamins. 9

7. a) Show the cleavage site and mention the number of fragments produced when the following polypeptide chain is treated with trypsin, carboxypeptidase B, Cyanogenbromide and pepsin separately. The chain is Met-tyr-Phe-Gly-Cys-Val-Arg.
- b) What are meant by peptide bond and glycosidic bond? 2
- c) Draw the titration curve of leucine. 3
- d) Describe the alpha helix structure of protein. 3

8. Write short notes on (any four)

4x3=12

- a) Mutarotation of carbohydrates
- b) Enzyme inhibition
- c) Tertiary structure of protein
- d) Amylose and amylopectin
- e) Denaturation of protein

ittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
FST 1st Year 2nd Semester Final Examination 2010
Subject: Basic Concept of Human Nutrition
Course Code: BHN-102

Full Marks: 70

Time: 3 Hours

Figure in the right margin indicate full marks.

(Answer Five (5) questions from each section where question no. 1 and 7 are compulsory.

Use separate answer script for each section)

Section: A

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|----|----|------------------------------------------------------------------------|---|
| 1. | a) | Write down the functions of protein with example. | 3 |
| | b) | Write the name of essential amino acids of an adult person. | 2 |
| | c) | Why animal proteins are better than plant proteins? | 2 |
| 2. | a) | What are the major nutritional problems in Bangladesh? | 5 |
| | b) | Write down the role of nutrition in human development. | 2 |
| 3. | a) | What are the types of nutritional assessment? | 2 |
| | b) | Explain the methods of dietary assessment | 5 |
| 4. | a) | Define food, nutrients and nutrition education. | 3 |
| | b) | Classify food. Describe the nutritive value of rice. | 4 |
| 5. | a) | Describe the loss of nutrients in different stages of food processing. | 5 |
| | b) | How do you prevent nutrients loss in cooking? | 2 |
| 6. | | Write short note on | |
| | a) | Atwater factors | 2 |
| | b) | Food beliefs and misconceptions | 2 |
| | c) | Protein energy malnutrition (PEM) | 3 |

Section: B

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|-----|----|---------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 7. | a) | What is tissue? Describe classification and functions of epithelial tissue. | 4 |
| | b) | Define connective tissue. Write the composition of bone. | 3 |
| 8. | a) | Describe the principles in the molecular logic of life. | 4 |
| | b) | Distinguishes between living organism and inanimate objects. | 3 |
| 9. | a) | Why do we need energy? Write down the energy values from 1gm each of carbohydrate, fat and protein. | 2 |
| | b) | The gram percentage composition of milk is 3.5% protein, 5.0% carbohydrate and 4.0% fat in sample. Calculate the calorie value of 240 gm of milk. | 5 |
| 10. | a) | Define lipids. Classify phospholipids with their sources. | 3 |
| | b) | Write the name of essential fatty acids. Give their physiological functions and sources. | 4 |
| 11. | a) | Define and classify vitamins. | |
| | b) | Explain the physiological functions, deficiency diseases and dietary sources for | 6 |
| | | i) Vitamin A | |
| | | ii) Riboflavin | |
| | | iii) Iron | |
| 12. | a) | Compare between prokaryotic and eukaryotic cell. | 4 |
| | b) | What are the chemical components of cell? | 3 |

Chittagong Veterinary and Animal Sciences University

Faculty of Food Science and Technology

FST 1st Year 2nd Semester Final Examination 2010

Subject: Organic Chemistry

Course Code: OCM-102

Full Marks: 70

Time: 3 Hours

Figure in the right margin indicate full marks.

(Answer **FOUR** questions from each section where question no. **1** and **6** are compulsory. Use separate answer script for each section)

Section: A

1. a) Assign IUPAC name of the following compounds: 3
 - i) $\text{CH}_3 - \text{C}(\text{Cl}_2) - \text{CH} = \text{CH} - \text{CH}_2 - \text{CH}_3$
 - ii) $\text{CH}_2\text{Cl} - \text{CH}_2 - \text{C}(\text{CH}_3)_2 - \text{COOH}$
 - iii) $\text{CH}_2\text{OH} - \text{CH}(\text{OH}) - \text{COOH}$
- b) What do you mean by carbonium ion and carbaion? 2
2. a) What kind of reaction can be expect of the carbon-carbon single bond and why? Explain with at least two examples. 4
- b) What are Markonikov's and anti-Markonikov's rules? Explain with example. 4
- c) Outline a general method of preparation of alkanes. 2
3. a) Write and name three isomeric carboxylic acids having the molecular formula $\text{C}_6\text{H}_{12}\text{O}_2$. Outline a method of preparation of any one of them. 3+3=6
- b) Discuss in brief the effect of substituent on the acidity of aliphatic monocarboxylic acids. 4
4. a) What is Kekules formula for the structure of benzene? 2
- b) Discuss the facts that supported Kekule formula for the structure of benzene. 6
- c) Write down the halogenation reaction of benzene. 2
5. a) How can you distinguish primary, secondary and tertiary alcohols by Oxidation test and Victor Meyer test? 6
- b) Outline two general method of preparation of alcohol. 4

Section: B

6. a) Write the structural formula of the following compounds: 3
i) 3-ethyl-2-methyl hexane.
ii) 2, 2-dimethyl pentane
iii) 4-bromo-3-methyl-1-butanol
b) What are functional group and homologous series? 2
7. a) Describe the orbital structure of the double bond. 2
b) Explain why alkenes have higher boiling point than alkanes with the same carbon skeleton. 2
c) Outline three general methods of preparation of alkynes. 6
8. a) What is fermentation? How can you obtain alcohol from cane sugar? Write down the reaction. 1+2=
b) Write down the addition and substitution reaction of ethers. 4
c) Compare the chemical properties of ethers and alcohols. 3
9. a) Write the following reaction: 6
i) Aldol condensation
ii) Clemmensen reduction
iii) Wolff-Kishner reduction.
b) Explain why the boiling point of carbonyl compounds are higher than the corresponding alkanes. 2
c) Write down the silver mirror test of aldehydes and ketones. 2
10. a) Distinguish 1°, 2° and 3° amines on the basis of Hinsberg test. 3
b) Outline a general method of preparation of each 1°, 2° and 3° amines. 6
c) What is Quaternary salt? 1

Chittagong Veterinary and Animal Sciences University

Faculty of Food Science and Technology

FST 1st Year 2nd Semester Final Examination 2010

Subject: Human Biology

Course Code: HBL-102

Full Marks: 70

Time: 3 Hours

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(Answer Five (5) questions from each section where question no. 1 and 7 are compulsory. Use separate answer script for each section)

Section: A

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|----|----|------------------------------------------------------------------------------------|---|
| 1. | a) | Draw and level a human cell. | 3 |
| | b) | Enumerate the biological functions of endoplasmic reticulum and mitochondria. | 4 |
| 2. | a) | What are the general functions of blood? | 2 |
| | b) | Describe the composition of blood. | 3 |
| | c) | What are the sites of development of RBC after birth? | 2 |
| 3. | a) | Describe the mechanism of blood coagulation. | 5 |
| | b) | What are the natural and laboratory used anticoagulants? | 2 |
| 4. | a) | Draw and level a nephron. | 5 |
| | b) | Write down the composition of urine. | 2 |
| 5. | a) | How many chambers and valves are present in human heart? Explain cardiac cycle. | 5 |
| | b) | Write down the functions of heart valves, artery and vein? | 2 |
| 6. | a) | Describe the steps of genesis of leucocytes. | 5 |
| | b) | State the concept of "Universal donors" and "Universal recipient" of blood groups. | 2 |

Section: B

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|-----|----|---------------------------------------------------------------------------------------|---|
| 7. | a) | Describe the digestion of carbohydrate in body. | 3 |
| | b) | Name the important constituents and their functions of gastric and pancreatic juices. | 4 |
| 8. | a) | What is semen? Give the composition of semen. | 4 |
| | b) | What is placenta? What are the functions of placenta? | 3 |
| 9. | a) | Describe the controlling system of human body. | 4 |
| | b) | What do you mean by residual change, regulation factor and gain? | 3 |
| 10. | a) | Explain the mechanism of gases exchange through lung. | 4 |
| | b) | What do you mean by positive end expiratory pressure (PEEP)? | 3 |
| 11. | a) | What are the functions of liver? | 3 |
| | b) | What is central nervous system? Explain the functions of brain and spinal cord. | 4 |
| 12. | | Write short note on | |
| | a) | Prothombin time | 2 |
| | b) | Functions of RBC | 2 |
| | c) | ABO blood group. | 3 |