

57

**Chittagong Veterinary and Animal Sciences University**  
**Faculty of Food Science and Technology**  
**FST 1<sup>st</sup> Year 2<sup>nd</sup> Semester Final Examination 2011**  
**Subject: Organic Chemistry (Theory)**  
**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: 05  
i)  $\text{CH}_3\text{-CH}(\text{CH}_3)\text{-CO-CH}_3$   
ii)  $\text{HO-CH}_2\text{-C}\equiv\text{C-CH}_2\text{-OH}$   
iii)  $\text{H}_2\text{N-CH}_2\text{-CH}_2\text{-C}(\text{CH}_3)_3$   
iv)  $\text{CH}_3\text{-CH}(\text{Cl})\text{-CH}_2\text{-CH}(\text{OH})\text{-CH}_2\text{-CHO}$   
v)  $\text{HC}\equiv\text{C-C}\equiv\text{C-C}\equiv\text{C-CH}_3$
2. a) Give two important methods of introducing OH group in an aromatic ring. 04  
b) State the following reaction: 04  
i) Gattermann Reaction  
ii) Reimer Tiemann Reaction  
c) How can you obtain p-hydroxybenzene from phenol? 02
3. a) Arrange the following cations in order of increasing stability: 03  
i)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{C}^+\text{H}_2$  ii)  $(\text{CH}_3)\text{C}^+$  iii)  $\text{CH}_3\text{CH}_2\text{C}^+\text{HCH}_3$   
b) Show with equation when propene is separately treated with dilute  $\text{KMNO}_4$  and  $\text{O}_3$  in  $\text{CCl}_4$ . 02  
c) Which of the following compounds undergo Aldol reaction and which undergo Cannizaro reaction? 05  
 $\text{Cl}_3\text{CCHO}$ ;  $\text{PhCOCH}_3$ ;  $(\text{CH}_3)_3\text{CCHO}$ ;  $\text{PhCOCH}_2\text{CH}_3$ ;  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$
4. a) Accomplish the following conversions: 10  
i) n-Butane to isobutene  
ii) Propene to acetic acid  
iii) Methyl alcohol to methane  
iv) Acetic acid to ethane  
v) Methane to acetylene.
5. a) Outline two general method of preparation of primary amines. 04  
b) How will you separate a mixture of primary, secondary and tertiary amines? 04  
c) Describe Hofmann's degradation of amides. 02

## Section: B

6. a) Write the structural formula of the following compounds:  
i) 2-ethyl-3-methyl pentanoic acid  
ii) 2-ethyl-4-methyl hexanoic acid  
b) Write and name three isomers having the molecular formula  $C_3H_6O$ .
7. a) How will you convert phenol into the following compounds:  
i) Picric acid, ii) Salicylic acid, iii) Benzene and iv) Aniline.  
b) How will you distinguish between phenol and benzyl alcohol?
8. a) On the basis of Huckel rule, account for the aromaticity of benzene.  
b) How will you convert the following compounds into benzene?  
i) Toluene ii) Benzoic acid iii) Benzenediazonium Chloride iv) Phenol.
9. a) Write down four (04) points of difference between aldehydes and ketones.  
b) Describe with reactions:  
i) Catalytic dehydrogenation of alcohols  
ii) Addition of Grignard reagent with carbonyl compound.  
c) Write the conversion reaction: Ethylene to Succinic acid.
10. a) Why is the boiling point of alcohol is higher than the same number of carbon containing alkane?  
b) How can you distinguish primary, secondary and tertiary alcohols by Lucas test?  
c) Complete the following reactions:  
i)  $CH_3OH + 3I_2 + 2P \longrightarrow$   
ii)  $CH_3CH_2-OH + HBr \longrightarrow$   
iii)  $CH_3CH_2-OH + PCl_3 \longrightarrow$   
iv)  $CH_3-OH + HCl \longrightarrow$

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Faculty of Food Science and Technology

FST 1<sup>st</sup> Year 2<sup>nd</sup> Semester Final Examination, 2011

Subject: Basic Concept of Human Nutrition

Course Code: BHN - 102

Full Marks: 70

Time: 3 Hours

Figures in the right margin indicate full marks.

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

**Section: A**

(Answer **FIVE** questions where question no. 1 is compulsory.)

- |   |    |  |   |
|---|----|--|---|
| 1 | a) | Distinguish between food and nutrition.  | 2 |
|   | b) | Describe the role of nutrition through out of the life cycle.                                | 5 |
| 2 | a) | Describe the loss of nutrients in different stages of food processing.                       | 5 |
|   | b) | How do you prevent nutrient loss in cooking?   | 2 |
| 3 | a) | What is PEM? What are the main types of PEM? What are the signs of marasmus and kwashiorkor? | 5 |
|   | b) | What is nutritional status and nutritional assessment?                                       | 2 |
| 4 | a) | What do you mean by Physical activity Level?   | 2 |
|   | b) | What is Z-score? Classify of nutritional status according to Z-score.                        | 3 |
|   | c) | What are the roles of a dietitian?   | 2 |
| 5 | a) | How malnutrition and infection make each other worse?  | 5 |
|   | b) | Write short note on food beliefs and misconception.  | 2 |
| 6 | a) | Classify the foods according to their functions.   | 3 |
|   | b) | What are the guidelines for good health?   | 2 |
|   | c) | What are the determinants of good health?  | 2 |

**Section: B**

(Answer **FIVE** questions where question no. 7 is compulsory.)

- |    |    |   |   |
|----|----|---|---|
| 7  | a) | What is antioxidant? Which vitamins are acting as antioxidants?   | 2 |
|    | b) | Define vitamin. What are the common characteristics of water and fat soluble vitamins?  | 5 |
| 8  | a) | Explain the bio-chemical functions, food sources, deficiency diseases and RDA of –<br>i) Iron<br>ii) Iodine   | 6 |
|    | b) | Define micronutrient. Why they are called so?   | 1 |
| 9  | a) | The gram percentage composition of egg is 8 gm protein, 8 gm fat and 0.6 gm carbohydrate in sample. Calculate the calorie value of an egg.<br>( Consider weight of an egg is 50 gm) | 3 |
|    | b) | What are the basic food groups?   | 1 |
|    | c) | How can you assess the quality of protein?  | 3 |
| 10 | a) | State how a mixture of rice and pulse makes a good quality of protein.  | 3 |
|    | b) | Classify protein. Give examples of food sources of each type of protein.  | 4 |
| 11 | a) | Define lipids. Classify phospholipids with their sources.   | 3 |
|    | b) | Write down the names of essential fatty acids & give their physiological functions and sources.   | 4 |
| 12 | a) | What are the components of energy requirements?   | 2 |
|    | b) | What is basal metabolic rate (BMR). What are the factors influences BMR?  | 5 |

Chittagong Veterinary and Animal Sciences University  
Faculty of Food Science and Technology  
BFST 1st Year 2nd Semester Final Examination, 2011  
Course Title: Biochemistry-I  
Course Code: BCM-102

Full Marks: 70

Time: 3 Hours

Figures 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. Write the importance of Biochemistry in Food Science. 2  
b. Give the evidences of ring structure of glucose. 4  
c. Define carbohydrate. Write down the functions of carbohydrate. 3  
d. Classify carbohydrate on the basis of hydrolysis. 2
- 2 a. What is reducing sugar? Give an example of monosaccharide with structure and show anomeric carbon, asymmetric carbon, primary alcohol and how many possible isomers will form from this sugar? 4  
b. Why glucose, mannose and fructose (from) the same osazone when these sugars are treated with phenylhydrazine? 3  
c. Write down the structure, functions and sources of three important disaccharides. 5
- 3 a. Mention the uses of the following reagents in protein chemistry: (i.) **Snager's reagent**; (ii.) **Edman's reagent** and (iii.) **Cynogen bromide** 3  
b. **V-M-T** is the single letter of amino acid abbreviation for a peptide. Draw the structure of this peptide. 3  
c. Define protein. Classify the protein on the basis of functions with appropriate examples. 3  
d. Describe the forces responsible for protein structure. 3
- 4 a. Define biocatalyst. Are all enzymes proteins? 4  
b. Enumerate the factors affecting enzyme action. Describe the effect of temperature and pH on enzyme action. 4  
c. Write down the distinguishing points for the following pairs: **Holoenzyme and Apoenzyme**; **Co-enzyme and Prosthetic group** 4

**Section: B**

- 5 a. Write down the structure of any six essential amino acids for adult. 4  
b. Classify amino acids on the basis of polarity. Give example for each. 2  
c. Define isoelectric pH,  $PK_1$ ,  $PK_2$  and  $PK_3$  of an acid amino acid are **2.32**, **3.46** and **8.64**, respectively. Calculate the isoelectric pH of that amino acid. 2  
d. Write short notes: (i.) Iodine number; (ii) Acid number and (iii) Micelles 3
- 6 a. Who discovered DNA? Explain central dogma of molecular biology. 4  
b. Write down the structure of (i) cAMP; (ii) TTP; (iii) UMP. 3  
c. Define the following terms: (i) Gene; (ii) Codon; (iii) Cloning and (iv) Plasmid 3  
d. Write down the complementary strand of **P-A-T-G-C-T-A-A-G-C-T**. 2
- 7 a. What is rancidity? What are the factors responsible for rancidity? How can fat be prevented from being rancid? 4  
b. What are phospholipids? Indicate the functions and hydrolytic products of Lecithin. 4  
c. Compare amylase with amylopectin in term of their molecular weights, reaction with iodine and type of bonds. Name one homo and one heteropolysaccharides. 4
- 8 **Write short notes on the followings (any three):** 4×3=12  
a. Enzyme specificity; b. Chargaff's rule; c. Michaelis-Menten equation & d. Energy transformation.

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

**Section: A**

(Answer **FOUR** questions where question no. 1 is compulsory.)

- |   |   |  |
|---|---|--|
| 1 | <ul style="list-style-type: none"> <li>a) What are the dimension and unit of the coefficient of thermal conductivity? <span style="float: right;">1</span></li> <li>b) Define thermometric conductivity. <span style="float: right;">1</span></li> <li>c) What are the values of absorptive, reflective and emissive power for a perfectly black body? <span style="float: right;">1</span></li> <li>d) Give two examples of optically active substance. <span style="float: right;">1</span></li> <li>e) What are the unit of resistivity and conductivity? <span style="float: right;">1</span></li> </ul>  |  |
| 2 | <ul style="list-style-type: none"> <li>a) Give the graphical distinction of DC and AC current. <span style="float: right;">2</span></li> <li>b) A circuit containing an inductor (L) and resistor (R) in a series and is connected to a battery. Obtain its equation for the growth and decay of current. <span style="float: right;">6</span></li> <li>c) From the above equation of question 2(b) define time constant for that circuit. <span style="float: right;">2</span></li> </ul>  |  |
| 3 | <ul style="list-style-type: none"> <li>a) Why radiant energy should be considered atomic in structure, like matter? <span style="float: right;">1</span></li> <li>b) Deduce Planck's radiation formula for black body spectrum and hence derive the Wien's and Raleigh-Jean's law from Planck's formula. <span style="float: right;">9</span></li> </ul>  |  |
| 4 | <ul style="list-style-type: none"> <li>a) Define – Interference, Diffraction, Coherent source and Optical activity. <span style="float: right;">2</span></li> <li>b) Distinguish among Ferromagnetism, Para-magnetism and Diamagnetism. <span style="float: right;">3</span></li> <li>c) A rectangular block of iron has dimensions 1.2 cm × 1.2 cm × 1.2 cm. A potential difference is to be applied to the block between parallel sides. What is the resistance of the block if the two parallel sides are: I) square ends with dimensions 1.2 cm × 1.2 cm, and II) two rectangular sides with dimensions 1.2 cm × 15 cm? <span style="float: right;">5</span></li> </ul> |  |
| 5 | <ul style="list-style-type: none"> <li>a) State and explain Kirchhoff's laws of electricity. <span style="float: right;">4</span></li> <li>b) In an unbalanced Wheatstone's bridge, arm resistances are R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>. Obtain the condition of the bridge given by R<sub>1</sub>/R<sub>2</sub> = R<sub>3</sub>/R<sub>4</sub>. <span style="float: right;">6</span></li> </ul>   |  |

**Section: B**

(Answer **FOUR** questions where question no. 6 is compulsory.)

- |    |   |  |
|----|---|--|
| 6  | <ul style="list-style-type: none"> <li>a) Draw the diode representation of the p-n-p and n-p-n transistor. <span style="float: right;">2</span></li> <li>b) Write down three names of donor and acceptor atoms. <span style="float: right;">2</span></li> <li>c) Define forward and reverse voltage. <span style="float: right;">1</span></li> </ul>                                      |  |
| 7  | <ul style="list-style-type: none"> <li>a) State and explain Faradays laws of electromagnetic induction. <span style="float: right;">4</span></li> <li>b) Define self and mutual inductance and write down their unit. <span style="float: right;">2</span></li> <li>c) Find the magnetic field inside a long solenoid carrying a current. <span style="float: right;">4</span></li> </ul> |  |
| 8  | <ul style="list-style-type: none"> <li>a) What is radioactivity? <span style="float: right;">2</span></li> <li>b) Deduce the law of radioactive disintegration. <span style="float: right;">4</span></li> <li>c) Obtain the expressions for the half-life and mean-life. <span style="float: right;">4</span></li> </ul>  |  |
| 9  | <ul style="list-style-type: none"> <li>a) Give with a diagram the construction of a diode. <span style="float: right;">3</span></li> <li>b) What are meant by intrinsic and extrinsic semiconductors? <span style="float: right;">3</span></li> <li>c) What are majority and minority carriers? <span style="float: right;">4</span></li> </ul>   |  |
| 10 | <ul style="list-style-type: none"> <li>a) State the postulates of the special theory of relativity. <span style="float: right;">4</span></li> <li>b) Deduce Einstein mass-energy relation. <span style="float: right;">6</span></li> </ul>  |  |

**Uttarakhand Veterinary and Animal Sciences University**  
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**Subject: Human Biology**  
**Course Code: (HBL -102)**

**Full Marks: 70**

**Time: 3 Hours**

Figures in the right margin indicate full marks.  
(Answer **FIVE** questions from each section where question no. 1 and 7 are compulsory. Use **separate answer script** for each section )

**Section: A**

*(Answer FIVE questions where question no. 1 is compulsory.)*

- |    |    |   |     |
|----|----|---|-----|
| 1. | a) | Why mitochondria is called power house of cell?                                   | 3   |
|    | b) | Sketch out the nucleus of a cell and write their biological functions.            | 4   |
| 2. | a) | Give the diagram of body fluid compartment of human being.                        | 2   |
|    | b) | What are the constituents of blood?   | 1.5 |
|    | c) | Differences between plasma and serum.   | 2   |
|    | d) | Noted down the RBC, WBC & platelets counts in normal health condition.            | 1.5 |
| 3. | a) | How the blood groups under 'ABO' type classified?                                 | 2   |
|    | b) | What are Packed Cell Volume (PCV) and ESR?  | 2   |
|    | c) | What is plasma protein? Give the classification of it.                            | 3   |
| 4. | a) | What is artery and vein? Write the name of a vein which carries oxygenated blood. | 2   |
|    | b) | Sketch and label the electrical structure of heart.                               | 5   |
| 5. | a) | Define blood pressure. What are the factors that affect arterial pressure?        | 3   |
|    | b) | What is heart sound and how many types of it?                                     | 2   |
|    | c) | Enumerate the relation between diet and cardio vascular diseases.                 | 2   |
| 6. | a) | How heart valves can malfunction?   | 2   |
|    | b) | What is Baroreceptor? How it works for controlling HAP?                           | 3   |
|    | c) | What are the functions and normal count of platelets?                             | 2   |

**Section: B**

*(Answer FIVE questions where question no. 7 is compulsory.)*

- |     |    |  |   |
|-----|----|--|---|
| 7.  | a) | Define tissue. Write the distributions and functions of epithelial tissue.                       | 5 |
|     | b) | Classify glands.   | 2 |
| 8.  | a) | What is respiration and inspiration?   | 2 |
|     | b) | What is normal respiration rate?   | 1 |
|     | c) | Sketch the diagram of gases exchange from body tissue to lung.                                   | 4 |
| 9.  | a) | Describe the role of kidney to regulate the body fluid, electrolyte and water balance.           | 6 |
|     | b) | What are the factors influencing fluid and electrolyte balance?                                  | 1 |
| 10. | a) | Illustrate the primary sex organ and puberty of human being.                                     | 2 |
|     | b) | Draw and label of human spermatozoa. Briefly discuss the hormonal regulation of spermatogenesis. | 5 |
| 11. | a) | Sketch the alimentary tract.   | 4 |
|     | b) | What is digestion? Describe the digestion process of protein.                                    | 3 |
| 12. |    | Write short note on  |   |
|     | a) | Functional organization of human body.   | 4 |
|     | b) | Hormonal regulation during pregnancy.  | 3 |