

Chattogram Veterinary and Animal Sciences University

BFST 1st year 1st Semester Final Examination, 2021

Course Title: Elementary Food Science (Theory)

Course Code: EFS-101 (T)

Full Marks: 70, Time: 3 Hours

(Figures in the right margin indicate full marks. Answer **Four (4)** questions from each section, where question No. **1** and **6** are compulsory. Use separate answer script for each section. Fractions of the questions must be answered together)

SECTION-A

1. a) Define food science. Mention the significance of food science in Bangladesh. 05
2. a) What is food? Describe the functions of food. 05
b) What do you mean by carbohydrate? Classify the carbohydrate with example 05
3. a) What is lipid? Why saturated fatty acids are harmful to our health? 04
b) Write down some names of some essential and non-essential fatty acids along with their sources. 04
c) "Lipid has biological importance for human body"- Justify 02
4. a) Define pigments. Give the list of four pigments with their colours. 04
b) What is browning reaction? Differentiate the enzymatic and non-enzymatic browning reaction. 03
c) Assess the importance of pigments for fruits and vegetables. 03
5. a) Write down the chemical name of vitamin A, D, E and K. 02
b) How vitamin-A help in visual cycle 04
c) Demonstrate how vitamin-E prevents atherosclerosis. 04

SECTION-B

6. a) What do you mean by cis and trans fat? How trans fat affects human health? 05
7. a) Explain the one-carbon metabolism with the sketch diagram 05
b) Dramatize the absorption process of vitamin B-6 in human body 05
8. a) Outline the hormonal signal from different organ during food intake- feedback regulation 04
b) Write down the biological function, food source and daily requirement of the following minerals: i) potassium ii) Iron 04
c) Define functional food and nutraceutical food. 02
09. a) What is dietary fibre? 02
b) Demonstrate the functions of carbohydrate in our body. 04
c) What is diverticulosis? How dietary fibre help to reduce diverticulosis? 04
10. a) List the essential amino acid. Why it's called essential? 04
b) Based on chemical composition classify the protein with proper example. 04
c) Define biological value of protein. 02

Chittagong Veterinary and Animal Sciences University

Faculty of Food Science and Technology

BFST 1st Year 1st Semester Final Examination, 2021

Subject: Physics-I

Course Code: PHC-101(T)

Full Marks: 70

Time: 3hours

(Figures in the right margin indicate full marks. Answer **Four (4)** questions from each section where question no. **1** and **6** are compulsory. Use separate answer script for each section. Split answer is discouraged.)

Section-A

1. a) Explain equation of continuity. 2
b) Define Poisson's ratio and shearing stress. 2
c) Write down the dimension of coefficient of viscosity. 1
2. a) Derive an expression for the twisting couple on a solid wire having radius 'R' and length 'L'. 5
b) Establish a relationship between different modulus in terms of Poisson's ratio and hence, show that Poisson's ratio lies between -1 to 0.5 for elastic substances. 5
3. a) Discuss the various form of energy possessed by a liquid in motion. 4
b) Define laminar flow and turbulent flow. Derive Bernoulli's equation for a fluid in stream line motion. 6
4. a) Establish a relation between thermal conductivity and thermometric conductivity. 2
b) Show that for a metal bar heated at one end,
 $\frac{d\theta}{dt} = h \frac{d^2\theta}{dx^2}$, where the symbols have their usual meanings. 5
c) Explain the cylindrical shell method of determining the conductivity of a solid. 3
5. a) Obtain the differential equation of a simple harmonic oscillator and hence, show that the motion exhibited by a spiral spring under load is simple harmonic in nature. 5
b) Show the total mechanical energy density of particles in an elastic medium executing plane progressive wave is constant and is proportional to the square of the amplitude. 5

Section-B

6. a) Derive the adiabatic equation, $TV^{\gamma-1} = \text{constant}$, where the symbols have their usual meanings. 3
b) Establish a relationship between surface tension and surface energy. 2
7. a) State and explain first law of thermodynamics. Mention the necessary conditions for isothermal and adiabatic processes. 4
b) Show that the kinetic energy of translation of gas molecules depends on temperature, no matter what types of molecules they are. 3
c) Establish a relationship between molar specific heats at constant volume and at constant pressure. 3
8. a) Write down the physical significance of capillarity in our daily life. 3
b) Derive Poiseuille's equation for the rate of flow of a viscous liquid through a capillary tube of small bore maintained at constant pressure difference. 7
9. a) Obtain an expression for a plane progressive wave and hence, establish a relationship between particle velocity and wave velocity. 4
b) Mention some major differences between plane progressive wave and stationary wave. 3
c) For a particle executing simple harmonic motion the displacement is 8cm at the instant the velocity is 6cm/s and the displacement is 6cm at the instant the velocity is 8cm/s. Calculate (i) amplitude (ii) frequency (iii) time period. 3
10. a) What do you mean by mean free path? Derive an expression for mean free path. 4
b) State second law of thermodynamics. 2
c) Derive an expression for the efficiency of a Carnot heat engine working between the temperatures T_1 and T_2 . 4

Chattogram Veterinary and Animal Sciences University

BFST 1st year 1st Semester Final Examination, 2021

Course Title: Communicative English (Theory)

Course Code: ENG-101 (T)

Full Marks: 35, Time: 2 Hours

(Figures in the right margin indicate full marks. Use separate answer script for each section. Fractions of the questions must be answered together)

SECTION-A

Answer ALL the questions

1. Correct the following sentences if they are incorrect. If the sentence is correct, just copy it. 5
 - a) He is one of my best friends in the campus.
 - b) More than sixty percent of population is worried about global warming.
 - c) I met him before the session had started.
 - d) If you come earlier, we could have solved all issues.
 - e) They should have informed the authority about this result.

2. Complete the following sentences: 5
 - a) It's interesting to know that _____
 - b) _____ provided that we take care of our health.
 - c) Had I the wings of dove, _____.
 - d) Some people behave as if _____.
 - e) Try your best in order to _____.

3. Nowadays a lot of people prefer to eat fast and package food more than home cooked food. As a result, they are not only missing out on essential nutrition but also risking their health eating highly processed, sugary and high-fat food. Suppose you are concerned about people's changing eating habit. Write a letter to the editor of "The Daily star" newspaper in this regard. 7

SECTION-B

4. Change the following sentences as directed: 5
 - a) He was laughed at by all his friends. (Change the voice.)
 - b) Who let the dog out? (Change the voice.)
 - c) "Mom, if I wear my sweater, will you let me have an ice-cream?" said the little girl. (Change the speech.)
 - d) We work hard. Our intention is be happy in life. (Join the sentences with subordinating conjunction while keeping the meaning unchanged.)
 - e) Tom asked Bob if he (Bob) had seen his (Tom's) wristwatch that he (Tom) had lost the previous day. (Change the speech.)

5. Write a paragraph of about 150 words on "The good sides of having a hobby". 5

6. Read the passage carefully and answer the questions that follow: 8

Collecting must be one of the most varied of human activities, and it's one that many of us psychologists find fascinating. Many forms of collecting have been dignified with a technical name: an archtophilist collects teddy bears, a philatelist collects postage stamps, and a deltiologist collects postcards. Amassing hundreds or even thousands of postcards, chocolate wrappers or whatever, takes time, energy and money that could surely be put to much more productive use. And yet there are millions of collectors around the world. Why do they do it?

There are the people who collect because they want to make money - this could be called an instrumental reason for collecting; that is, collecting as a means to an end. They'll look for, say, antiques that they can buy cheaply and expect to be able to sell at a profit. But there may well be a psychological element, too - buying cheap and selling dear can give the collector a sense of triumph. And as selling online is so easy, more and more people are

joining in.

Many collectors collect to develop their social life, attending meetings of a group of collectors and exchanging information on items. This is a variant on joining a bridge club or a gym, and similarly brings them into contact with like-minded people. Another motive for collecting is the desire to find something special, or a particular example of the collected item, such as a rare early recording by a particular singer.

Some may spend their whole lives in a hunt for this. Psychologically, this can give a purpose to a life that otherwise feels aimless. There is a danger, though, that if the individual is ever lucky enough to find what they're looking for, rather than celebrating their success, they may feel empty, now that the goal that drove them on has gone.

If you think about collecting postage stamps another potential reason for it - or, perhaps, a result of collecting- is its educational value. Stamp collecting opens a window to other countries, and to the plants, animals, or famous people shown on their stamps. Similarly, in the 19th century, many collectors amassed fossils, animals and plants from around the globe, and their collections provided a vast amount of information about the natural world. Without those collections, our understanding would be greatly inferior to what it is.

In the past - and nowadays, too, though to a lesser extent - a popular form of collecting, particularly among boys and men, was trainspotting. This might involve trying to see every locomotive of a particular type, using published data that identifies each one, and ticking off each engine as it is seen. Trainspotters exchange information, these days often by mobile phone, so they can work out where to go to, to see a particular engine. As a by-product, many practitioners of the hobby become very knowledgeable about railway operations, or the technical specifications of different engine types.

Similarly, people who collect dolls may go beyond simply enlarging their collection, and develop an interest in the way that dolls are made, or the materials that are used. These have changed over the centuries from the wood that was standard in 16th century Europe, through the wax and porcelain of later centuries, to the plastics of today's dolls. Or collectors might be inspired to study how dolls reflect notions of what children like, or ought to like.

Not all collectors are interested in learning from their hobby, though, so what we might call a psychological reason for collecting is the need for a sense of control, perhaps as a way of dealing with insecurity. Stamp collectors, for instance, arrange their stamps in albums, usually very neatly, organising their collection according to certain commonplace principles- perhaps by country in alphabetical order, or grouping stamps by what they depict- people, birds, maps, and so on.

One reason, conscious or not, for what someone chooses to collect is to show the collector's individualism. Someone who decides to collect something as unexpected as dog collars, for instance, may be conveying their belief that they must be interesting themselves. And believe it or not, there is at least one dog collar museum in existence, and it grew out of a personal collection.

Of course, all hobbies give pleasure, but the common factor in collecting is usually passion: pleasure is putting it far too mildly. More than most other hobbies, collecting can be totally engrossing, and can give a strong sense of personal fulfilment. To non-collectors, it may appear an eccentric, if harmless, way of spending time, but potentially, collecting has a lot going for it.

Choose ONE WORD ONLY from the passage for each answer.

- a) The writer mentions collecting as an example of collecting in order to make money.
- b) Collectors' clubs provide opportunities to share.....
- c) Searching for something particular may prevent people from feeling their life is completely.....
- d) tends to be mostly a male hobby.
- e) The writer mentions collecting as an example of collecting in order to make money.

Do the following statements agree with the information given in the reading passage?

Beside question number e—h on your answer sheet, write:

TRUE if the statement agrees with the information
FALSE if the statement contradicts the information
NOT GIVEN if there is no information on this

- e) The number of people buying dolls has grown over the centuries.
- f) Arranging a stamp collection by the size of the stamps is less common than other methods.
- g) Someone who collects unusual objects may want others to think he or she is also unusual.
- h) Collecting gives a feeling that other hobbies are unlikely to inspire.

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 1st year 1st Semester Final Examination 2021
Subject: Inorganic Chemistry (Theory)
Course Code: ICM-101 (T)

Full Marks: 70

Time: 3 hours

(Figures in the right margin indicate full marks. Answer any four questions from each section, where 1 and 6 are compulsory. Use separate answer script for each section. Split answer is strongly discouraged.)

Section-A

1. Derive Henderson-Hasselbalch equation for acidic buffer solution. 5
2. a) What do you mean by an ionic bond? What are the conditions for the formation of this type of bond? 4
b) Distinguish between covalent and co-ordination bond. 3
c) Carbon-Oxygen bond is polar but CO₂ molecule is non-polar; explain. 3
3. a) What is hydrogen bond? 2
b) Explain intra molecular and inter molecular hydrogen bond. 3
c) Explain variable electrovalency and variable covalency. 5
4. a) What do you mean by p^H? Write down the significance of p^H. 3
b) Explain conjugated acid-base pairs with examples. 3
c) What is buffer solution? Write down the mechanism of buffer solution. 4
5. a) What do you mean by oxidation number? 'Oxidation number is different from valency', justify your answer. 4
b) Balance the following method by oxidation number method 6
$$\text{K}_2\text{Cr}_2\text{O}_7 + \text{H}_2\text{SO}_4 + \text{FeSO}_4 \rightarrow \text{K}_2\text{SO}_4 + \text{Cr}_2(\text{SO}_4)_3 + \text{Fe}_2(\text{SO}_4)_3 + \text{H}_2\text{O}$$

Section-B

6. Draw a flow chart of isolation of inert gases by coconut charcoal method. 5
7. a) Classify covalent bond. 2
b) Explain the formation of covalent bond of CO₂ and NH₃ molecules. 4
c) Explain the formation of co-ordination bond of H₂O₂ and CO molecules. 4
8. a) What do you mean by nitrogen fixation? Explain. 3
b) Describe the production process of soda ash by solvey method with a flow diagram. 7
9. a) Write down various sources of Na. 2
b) Mention some uses of Mg and Be. 2
c) Describe the lane's process and bosch process of hydrogen production. 6
10. a) Write down some uses of sulfuric acid and boric acid. 3
b) Give a brief description of compound of carbon. 3
c) Describe the frash process of sulfur extraction. 4

Chattogram Veterinary and Animal Sciences University
BFST 1st year 1st Semester Final Examination, 2021
Course Title: Introductory Human Nutrition (Theory)
Course Code: IHN-101 (T)
Full Marks: 70, Time: 3 Hours

(Figures in the right margin indicate full marks. Answer **Three (5)** questions from each section, where question No. 1 and 7 are compulsory. Use separate answer script for each section. Fractions of the questions must be answered together)

SECTION-A

- | | | | |
|----|----|--|----|
| 1. | a) | Define nutrition and nutrients. | 02 |
| | b) | Who is the father of human nutrition? Write down the history of human nutrition. | 05 |
| 2. | a) | Compare between growth and development. | 02 |
| | b) | Explain the roles of nutrients in human growth and development. | 05 |
| 3. | a) | Classify male and female on the basis of activity level. | 01 |
| | b) | What are the main causes of premature birth? | 02 |
| | c) | How do you modify elderly people's diet? | 04 |
| 4. | a) | What are the major hormones related with pregnancy? | 01 |
| | b) | List some negative effects of alcohol, caffeine and tobacco during pregnancy. | 02 |
| | c) | Explain the major physiological changes occurred during pregnancy. | 04 |
| 5. | a) | Compare between human's milk and cow's milk. | 02 |
| | b) | Elaborate the importance of micronutrients for maternal health. | 05 |
| 6. | a) | What are the common nutrients needed during pregnancy period? | 02 |
| | b) | Explain the deficiency disease among preschool children. | 05 |

SECTION-B

- | | | | |
|-----|----|---|----|
| 7. | a) | List the nutrition related problems of elderly people. | 02 |
| | b) | Explain physical, physiological and psychological changes of elderly people. | 05 |
| 8. | a) | Express the eating disorders of adolescent girls. | 04 |
| | b) | What are the factors to be considered in planning packed lunch for school going children? | 03 |
| 9. | a) | Differentiate between supplementary and complementary feeding. | 02 |
| | b) | Discuss the WHO-UNICEF guidelines of complementary feeding. | 05 |
| 10. | a) | Write down the importance of breastfeeding. | 03 |
| | b) | Illustrate the stage of human growth and development. | 04 |
| 11. | a) | Define low birth weight (LBW). Enlist the causes of LBW. | 04 |
| | b) | Write down the management of low birth weight baby. | 03 |
| 12. | a) | Define health. State the dietary guidelines for good health. | 03 |
| | b) | What is balanced diet? What are the factors considered to prepare balanced diet? | 04 |

Chattogram Veterinary and Animal Sciences University

BFST 1st year 1st Semester Final Examination, 2021

Course Title: Human Biology (Theory)

Course Code: HBL-101 (T)

Full Marks: 70, Time: 3 Hours

(Figures in the right margin indicate full marks. Answer **Four (4)** questions from each section, where question No. 1 and 6 are compulsory. Use separate answer script for each section. Fractions of the questions must be answered together)

SECTION-A

- | | | | |
|----|----|---|------------------|
| 1. | a) | Why cell is considered as a basic unit of life? | 01 |
| | b) | Draw and label the cell membrane. List the functions of it. | 02 |
| | c) | Write down the physiological functions of endoplasmic reticulum and mitochondria. | 02 |
| 2. | a) | Enlist the reproductive hormones in male and female. | 01 |
| | b) | What is spermatogenesis? Show the diagrammatic representation of spermatogenesis. | 03 |
| | c) | Write down the parts of female reproductive system sequentially. What are the functions of ovary? | 03 |
| | d) | What is capacitation? Write down the composition of semen. | 03 |
| 3. | a) | Write down the valves of heart with their function. | 02 |
| | b) | List the types of circulation in the body | 01 |
| | c) | Define and classify blood pressure | 02 |
| | d) | Classify granulocytes. Write their morphology and functions | 03 |
| | e) | What is homeostasis? Which systems of the body is maintained homeostasis? | 02 |
| 4. | a) | What is nephron? Draw and label a nephron | 03 |
| | b) | Define glomerular filtration rate and renal threshold. | 02 |
| | c) | Briefly discuss the glomerular filtration of urine formation | 02 |
| | d) | How urine volume is regulated show in a sketch? | 03 |
| 5. | a) | Classify respiration? Draw the upper respiratory tract with explanation. | 04 |
| | b) | List the functions of trachea and alveoli with figure | 03 02 |
| | c) | Explain the way of transportation of CO ₂ from cell to lung. | 04 |

SECTION-B

- | | | | |
|-----|----|--|----|
| 6. | a) | Define digestion and absorption. Write down the composition of succus entericus. | 05 |
| 7. | a) | Sketch carbohydrates absorption pathway with explanation. | 03 |
| | b) | Identify GI secretion associated with the human digestive system | 02 |
| | c) | What are the steps involved in fat digestion and absorption? | 05 |
| 8. | a) | Distinguish the concept of hormones, receptors, and target cell. | 03 |
| | b) | Categorize hormone according to their chemical composition. | 04 |
| | c) | Interpret how PTH regulates Ca concentration in blood. | 03 |
| 9. | a) | Briefly describe the roles of kidneys. | 05 |
| | b) | List any five endocrine gland and their associated hormones with functions. | 05 |
| 10. | a) | Describe the composition of blood. | 03 |
| | b) | Blood plays a vital role in homeostasis by regulation-Justify it as a function | 03 |
| | c) | Discuss the importance of erythrocytes and leukocytes. | 04 |

Chittagong Veterinary and Animal Sciences University

Faculty of Food Science and Technology

BFST 1st Year 1st Semester Final Examination, 2021

Subject: Mathematics-I

Course Code: MTH-101(T)

Full Marks: 70

Time: 3 hours

(Figures in the right margin indicate full marks. Answer any Five (5) questions from each section. Use separate answer scripts for each section. Split answer is strongly discouraged.)

Section-A

1. a) Define skew-symmetric and Hermitian matrix with your own examples. 2
- b) Solve the following system of linear equations: 5
- $$\begin{aligned}8x_1 - x_2 + x_3 &= 2 \\2x_1 + x_2 &= 1 \\x_1 + 6x_2 - x_3 &= 3\end{aligned}$$
2. a) Express $\begin{bmatrix} 1 & 2 & 0 \\ 3 & 7 & 1 \\ 5 & 9 & 3 \end{bmatrix}$ as a sum of symmetric and skew-symmetric matrix. 4
- b) Show that $\begin{bmatrix} \cos \theta & 0 & \sin \theta \\ 0 & 1 & 0 \\ -\sin \theta & 0 & \cos \theta \end{bmatrix}$ is an orthogonal matrix. 3
3. a) Find the natural domain and range of the function $f(x) = 2 - \sqrt{x+1}$. 2
- b) Show that the function 5
- $$f(x) = \begin{cases} x^2 + 2, & x \leq 1 \\ x + 2, & x > 1 \end{cases}$$
- is continuous but not differentiable at
- $x = 1$
- .
4. a) If $y = \sin(m \sin^{-1} x)$, show that $(1 - x^2)y_{n+2} = (2n + 1)x y_{n+1} + (n^2 - m^2)y_n$. 4
- b) State the Rolle's theorem. Does Rolle's theorem apply to $f(x) = (x - 3)(x + 1)^2$ on $[-1, 3]$? If not, why not? If so, find the value of c . 3
5. a) If $f(x) = x^3 + x^2 - 5x - 5$ then (i) find the intervals on which f is increasing and the intervals on which f is decreasing. (ii) sketch the graph of f (iii) find the local extrema of f . 4
- b) Expand the function $f(x) = e^x$ in powers of $(x - 1)$. 3
6. a) Find the slopes in the x - direction and y - direction of the surface. 3
- $$f(x, y) = \frac{x^2}{2} - y^2 + \frac{25}{8} \text{ at point } \left(\frac{1}{2}, 1, 2\right)$$
- b) Find the second-order partial derivatives of the function $z = e^{xy^2}$. 4

Section-B

7. a) Evaluate the following integrals (any two): (i) $\int \frac{4x^2 dx}{(1-x^2)^{\frac{3}{2}}}$ (ii) $\int \frac{dx}{(1-x)\sqrt{1+x}}$ 4
 (iii) $\int 2x \cdot \sin^{-1}(x^2) dx$.
- b) Evaluate $\int_0^3 f(x) dx$ if $f(x) = \begin{cases} x^2, & x < 2 \\ 3x - 2, & x \geq 2 \end{cases}$ 3
8. a) Define beta and gamma function. Prove that, $\Gamma(n+1) = n\Gamma(n)$ 3
- b) Evaluate the following integrals using gamma and beta function (any two): 4
 (i) $\int_0^\infty x^{\frac{1}{2}} e^{-x^{\frac{1}{3}}} dx$ (ii) $\int_0^1 x^2(1-x^2)^4 dx$ (iii) $\int_0^{\frac{\pi}{2}} \sin^3 x \cdot \cos^5 x dx$
9. a) Obtain the area of the surface that is generated by revolving the portion of the curve $y = x^2$ between $x = 1$ and $x = 2$ about y -axis. 5
- b) Evaluate the double integral I, where, 2

$$I = \int_1^2 \int_0^1 x^3 y^2 dx dy$$
10. a) Find the volume and area of the surface that is generated by revolving the portion of the curve $y = x^3$ between $x = 0$ and $x = 1$ about x -axis. 5
- b) Find the projections of the point $(2, 1, -3)$ on the (i) co-ordinate planes and (ii) co-ordinate axes. 2
11. a) Show that the two lines represented by $x^2(\tan^2\theta + \cos^2\theta) - 2xy \tan\theta + y^2 \sin^2\theta = 0$ make angles α, β with x -axis such that $\tan\alpha - \tan\beta = 2$. 4
- b) For what value of λ does the equation $12x^2 + 7xy + \lambda y^2 + 13x - y + 3 = 0$ represent a pair of straight lines and what is then the angle between them. 3
12. a) Verify whether it is possible for a line to make the angles $30^\circ, 45^\circ$ and 60° with the co-ordinate axes or not? 2
- b) Find the magnitudes and equations of the shortest distance between the lines $\frac{x-6}{3} = \frac{y-7}{-1} = \frac{z-4}{1}$ and $\frac{x}{-3} = \frac{y+9}{-2} = \frac{z-2}{4}$. 5