

Chattogram Veterinary and Animal Sciences University

BFST 1st Year 1st Semester Final Examination-2023

Course Title: Communicative English (Theory)

Course Code: 0231-ENG-101 (T)

Full Marks: 35, Time: 2 Hours

(Figures in the right margin indicate full marks. Answer all the questions. Use separate answer script for each section. Split answers are strongly discouraged.)

SECTION-A

1. Correct the following sentences if they are incorrect. If the sentence is correct, just copy it. 1×5=5
 - a) I made him to understand the poem.
 - b) The man is comparatively better today.
 - c) He had been died last year.
 - d) One of my friend is good at English.
 - e) The pair of shoes that I had lost was costly.

2. Complete the following sentences: 1×5=5
 - a) It was long since _____.
 - b) He talked as if _____.
 - c) The question is too hard _____.
 - d) _____ until you reach your goal.
 - e) It's true that Artificial Intelligence (AI) will _____.

3. Recently you saw an article in a newspaper about a town and some of the information in the article was incorrect. Write a letter to the editor of the newspaper regarding this. 7

In your letter you should tell

 - How do you know about this town?
 - What information was incorrect?
 - What the editor should do about this?

SECTION-B

4. Change the following sentences as directed: 1×5=5
 - a) What cannot be cured must be endured. (Change the voice.)
 - b) She let me go. (Change the voice.)
 - c) "You? But you are small." said the authoress to the boy. (Change the speech.)
 - d) We try hard. Our intention is to succeed in life. (Join the sentences with a subordinating conjunction while keeping the meaning unchanged.)
 - e) Father asked his sons if they will divide up after his death. (Change the speech.)

5. Write a paragraph of about 150 words on "the effects of unhealthy eating habits." 5

6. Read the passage carefully and answer the questions that follow: 1×8=8

Ant Intelligence

* *aphids*: small insects of a different species from ants

When we think of intelligent members of the animal kingdom, the creatures that spring immediately to mind are apes and monkeys. But in fact, the social lives of some members of the insect kingdom are sufficiently complex to suggest more than a hint of intelligence. Among these, the world of the ant has come in for considerable scrutiny lately, and the idea that ants demonstrate sparks of cognition has certainly not been rejected by those involved in these investigations.

Ants store food, repel attackers and use chemical signals to contact one another in case of attack. Such chemical communication can be compared to the human use of visual and auditory channels (as in religious chants, advertising images and jingles, political slogans and martial music) to arouse and propagate moods and attitudes. The biologist Lewis Thomas wrote Ants are so much like human beings as to be an embarrassment. They farm fungi, raise aphids as livestock, launch armies to war, use chemical sprays to alarm and confuse enemies, capture slaves, engage in child labour, exchange information ceaselessly. They do everything but watch television.

However, in ants there is no cultural transmission - everything must be encoded in the genes - whereas In humans the opposite is true. Only basic instincts are carried in the genes of a newborn baby, other skills being learned from others in the community as the child grows up. It may seem that this cultural continuity gives us a huge advantage over ants. They have never mastered fire nor progressed. Their fungus farming and aphid herding crafts are sophisticated when compared to the agricultural skills of humans five thousand years ago but have been totally overtaken by modern human agribusiness.

Or have they? The farming methods of ants are at least sustainable. They do not ruin environments or use enormous amounts of energy. Moreover, recent evidence suggests that the crop farming of ants may be more sophisticated and adaptable than was thought.

Ants were farmers fifty million years before humans were. Ants can't digest the cellulose in leaves - but some fungi can. The ants, therefore, cultivate these fungi in their nests, bringing them leaves to feed on, and then use them as a source of food. Farmer ants secrete antibiotics to control other fungi that might act as 'weeds', and spread waste to fertilise the crop.

It was once thought that the fungus that ants cultivate was a single type that they had propagated, essentially unchanged from the distant past. Not so. Ulrich Mueller of Maryland and his colleagues genetically screened 862 different types of fungi taken from ants' nests. These turned out to be highly diverse: it seems that ants are continually domesticating new species. Even more impressively, DNA analysis of the fungi suggests that the ants improve or modify the fungi by regularly swapping and sharing strains with neighboring ant colonies.

Whereas prehistoric man had no exposure to urban lifestyles - the forcing house of intelligence - the evidence suggests that ants have lived in urban settings for close on a hundred million years, developing and maintaining underground cities of specialised chambers and tunnels.

When we survey Mexico City, Tokyo, Los Angeles, we are amazed at what has been accomplished by humans. Yet Hoelldobler and Wilson's magnificent work for ant lovers, *The Ants*, describes a supercolony of the ant *Formica yessensis* on the Ishikari Coast of Hokkaido. This 'megalopolis' was reported to be composed of 360 million workers and a million queens living in 4,500 interconnected nests across a territory of 2.7 square kilometers.

Such enduring and intricately meshed levels of technical achievement outstrip by far anything achieved by our distant ancestors. We hail as masterpieces the cave paintings in southern France and elsewhere, dating back some 20,000 years. Ant societies existed in something like their present form more than seventy million years ago. Beside this, prehistoric man looks technologically primitive. Is this then some kind of intelligence, albeit of a different kind?

Research conducted at Oxford, Sussex and Zurich Universities has shown that when desert ants return from a foraging trip, they navigate by integrating bearings and distances, which they continuously update their heads. They combine the evidence of visual landmarks with a mental library of local directions, all within a framework which is consulted and updated. So ants can learn too.

foraging teams. They engaged in contact sessions, at the end of which the scout was removed in order to observe what her team might do. Often the foragers proceeded to the exact spot in the maze where the food had been. Elaborate precautions were taken to prevent the foraging team using odour clues. Discussion now centers on whether the route through the maze is communicated as a 'left- right' sequence of turns or as a 'compass bearing and distance' message.

During the course of this exhaustive study, Reznikova has grown so attached to her laboratory ants that she feels she knows them as individuals - even without the paint spots used to mark them. It's no surprise that Edward Wilson, in his essay, 'In the company of ants', advises readers who ask what to do with the ants in their kitchen to: 'Watch where you step. Be careful of little lives.'

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

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

- a) Ants use the same channels of communication as humans do.
- b) City life is one factor that encourages the development of intelligence.
- c) Ants can build large cities more quickly than humans do.
- d) Some ants can find their way by making calculations based on distance and position.

Complete the summary using the list of words below.

Ants have sophisticated methods of farming, including herding livestock and growing crops, which are in many ways similar to those used in human agriculture. The ants cultivate a large number of different species of edible fungi which convert e).....into a form which they can digest. They use their own natural f)..... as weed-killers and also use unwanted materials as g) Genetic analysis shows they constantly upgrade these fungi by developing new species and by h) species with neighboring ant colonies.

aphids	agricultural	cellulose	exchanging
secretions	fertilizers	food	fungi
growing	interbreeding	natural	other species

Full Marks: 70

Time: 3 Hours

(Figures in the right margin indicate full marks. Answer five (5) questions from each section. Use separate answer scripts for each section. Fractions of the questions must be answered together.)

SECTION-A

1. a) Define transpose and orthogonal matrix with example. 1+1=2
 b) Apply row operation method to find the inverse of the following matrix, 5

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 5 & 3 \\ 1 & 0 & 8 \end{pmatrix}$$

2. a) "Every system of linear equations has whether no solutions, exactly one solution or infinitely many solutions" – explain. 2
 b) Solve the system by Gauss-Jordan elimination: 5

$$\begin{aligned} x_1 + x_2 + 2x_3 &= 8, \\ -x_1 - 2x_2 + 3x_3 &= 1, \\ 3x_1 - 7x_2 + 4x_3 &= 10. \end{aligned}$$

3. a) The curve C has equation, $y = \frac{3}{4}x^2 - 4x - 10$. 4
 i) The point P has coordinates (6, -7) and lies on the curve C. Find the equation of the tangent to C at P.
 ii) The point Q lies on C and is such that the gradient of the normal to C at Q is -2. Find the x-coordinate of Q.
 b) An Apache helicopter of enemy is flying along the curve given by $y = x^2 + 7$. A soldier, placed at (3, 7), wants to shoot down the helicopter when it is nearest to him. Find the nearest distance. 3

4. a) What do you understand by a linear programming problem (LPP)? 1+2=3
 Mention some application of LPP.
 b) Find the values of x and y that maximize, $z = x + 3y$; 4
 subject to

$$\begin{aligned} 2x + 3y &\leq 24, \\ x - y &\leq 7, \\ y &\leq 6, \\ x &\geq 0, \\ y &\geq 0. \end{aligned}$$

5. a) Show that the function $f(x) = |x| + |x+1|$ can be expressed as the 4
 following function- $f(x) = \begin{cases} -2x - 1 & \text{when } x < 0, \\ 1 & \text{when } -1 < x \leq 0, \\ 2x + 1 & \text{when } x \geq 0, \end{cases}$
 i) Draw the graph of the given function $f(x)$.
 ii) Find the Domain and range of $f(x)$.
 Describe the properties of the graph of $f(x)$.
 b) Use the horizontal line test to show that $f(x) = x^2$ has no inverse but that $f(x) = x^3$ does. 3

6. a) If $u = \frac{1}{\sqrt{x^2 + y^2 + z^2}}$ then prove that $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = 0$. 3
 b) If $y = m \cos^{-1} x$ then show that 4

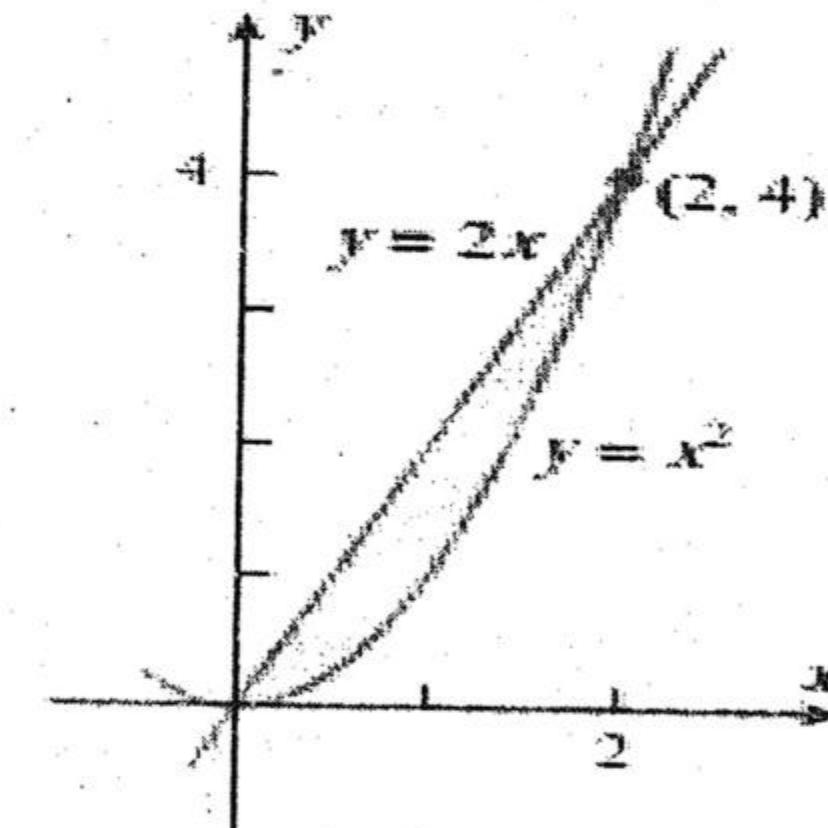
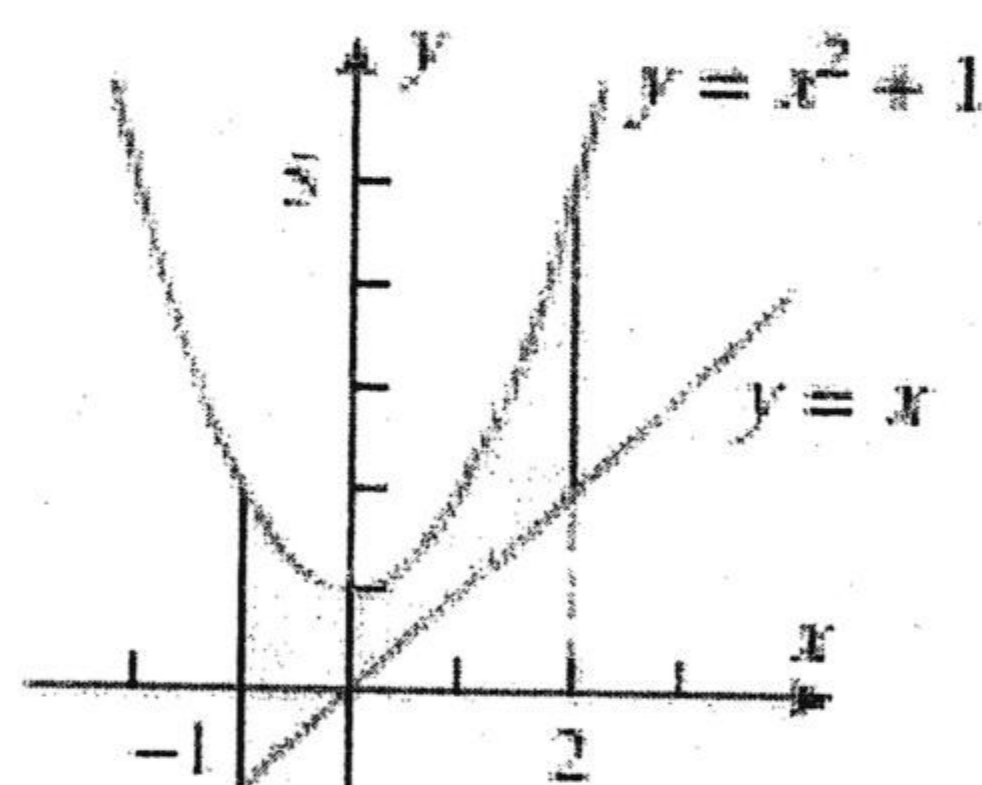
$$(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} - (n^2 + m^2)y_n = 0.$$

SECTION-B

7. a) Define First and Second Eulerian Integrals. Show that $\Gamma(n+1) = n\Gamma n$. 1+2=3
 b) Show that $\int_0^{\pi/2} \sin^m \theta \cos^n \theta d\theta = \frac{\Gamma\left(\frac{m+1}{2}\right)\Gamma\left(\frac{n+1}{2}\right)}{2\Gamma\left(\frac{m+n+2}{2}\right)}$. Hence find the 4

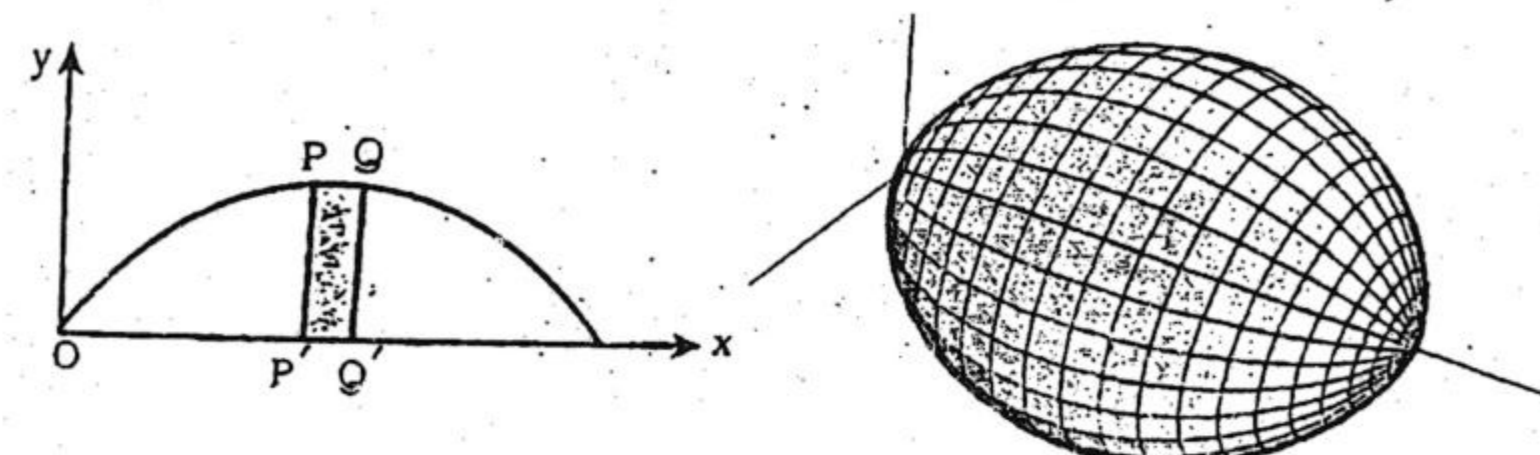
value of the following integral $\int_0^1 x^3(1-x)^4 dx$.

8. Find the area of the shaded region: 3.5+3.5=7



9. a) Find the area enclosed by the curve $x^3 = y^2(2a-x)$ and its asymptote. 4
 b) Find the arc length of the following hyperbola $y^2 = 12x$ with its latus rectum. 3
10. a) Draw the graph of the following, $r = a \sin 2\theta$. 2
 b) Find the volume of the following solid cube produced by the revolution of the curve, 5

$$x = a(\theta - \sin \theta), y = a(1 - \cos \theta).$$



11. a) Find the condition that the general equation of the second degree $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ may represent a straight line. 4
 b) Find in symmetrical form of the equation of a line $x+y+z+1=0 = 4x+y-2z+2$. 3
12. a) Define shortest distance between two non-intersecting lines. 1
 b) Find the ratio in which the yz plane divides the joint of the points $(-2,4,7)$ and $(3,-5,8)$ and also find the coordinates of the point of intersection of this line with the yz -plane. 3
 c) Define the direction cosines. A line makes angles $\alpha, \beta, \gamma, \delta$ with the four diagonals of a cube, prove that $\cos^2 \alpha + \cos^2 \beta + \cos^2 \gamma + \cos^2 \delta = \frac{4}{3}$. 3

Full Marks: 70

Time: 3 Hours

(Figures in the right margin indicate full marks. Answer four (4) questions from each section where question number 1 and 6 are compulsory. Use separate answer scripts for each section. Fractions of the questions must be answered together.)

SECTION-A

1. a) State and explain Hooke's law. 2
 b) Define coefficient of viscosity and write down its unit. 3

2. a) Write the physical significance of capillarity in our daily life. 3
 b) Show that, the surface tension of a liquid is equal to the mechanical part 3
 of its surface energy.
 c) Show that, the excess pressure inside a soap bubble of radius 'r' over the 4
 atmospheric pressure outside is equal to $\frac{4T}{r}$, where T is the surface
 tension of the liquid bubble.

3. a) State and explain equation of continuity. Derive Bernoulli's equation for a 2+2= 4
 fluid in stream line motion.
 b) Water stands at a depth 'H' in a large open tank whose side walls are 6
 vertical. A hole is drilled into one of the walls at a depth 'h' below the
 water surface. Find (i) The velocity of Efflux (ii) The distance 'R' from
 the foot of the wall does the emerging stream of water strike the floor?

4. a) Define co-efficient of thermal conductivity. Derive the expression for 1+4= 5
 rectilinear propagation of heat:

$$\frac{d\theta}{dt} = h \frac{d^2\theta}{dx^2}$$
; Where the symbols have their usual meanings.
 b) Show that the efficiency of Carnot's engine using an ideal gas as the 5
 working substance is $\eta = 1 - \frac{T_2}{T_1}$, Where the symbols have their usual
 meanings.

5. a) Obtain an expression for the differential equation of a simple harmonic 5
 oscillator and hence, show that the motion executed by a spiral spring
 suspended from a fixed support under load is simple harmonic in nature.
 b) "The total mechanical energy density of particles in an elastic medium 5
 executing plane progressive wave motion is constant and is proportional
 to the square of the amplitude"- verify the statement.

SECTION-B

6. a) What do you mean by the terms "Degree's of freedom" and "Mean free 2+2= 4
 path" of gas molecules? Derive an expression for the mean path travelled
 by gas molecules between successive collisions.
 b) State Carnot's theorem on thermodynamics. 1

7. a) Derive an expression for the moment of the couple required to twist one 4+2= 6
 end of a cylinder, while the other end is fixed. Show that, a hollow
 cylinder is stronger than a solid one of the same material, mass and length.
 b) Define modulus of rigidity. Derive an expression, $\eta = \frac{Y}{2(1+\sigma)}$, Where the 4
 symbols have their usual meanings.

8. a) State and explain first law of Thermodynamics. Mention some necessary conditions for both isothermal and adiabatic processes. 1+2= 3
- b) "The kinetic energy of translation of gas molecules depends on temperature, no matter what types of molecules they are"- justify the statement. 3
- c) State Maxwell's equipartition of energy theorem. Establish a relationship between molar specific heat at constant pressure with that at constant volume for an ideal piston-cylinder arrangement working with gas molecules. 1+3= 4
9. a) Derive an expression for surface tension of a liquid inside a capillary tube according to capillary rise method. 3
- b) What is critical velocity? Derive Poiseuille's equation, $\eta = \frac{\pi Pr^4}{8lV}$, Where the symbols have their usual meanings. 1+6= 7
10. a) Derive the adiabatic equation, $TV^{\gamma-1} = \text{constant}$, where the symbols have their usual meanings. 4
- b) Write down the postulates of kinetic theory of gases. 3
- c) Explain the factors affecting the velocity of sound. 3

Course Title: Introductory Human Nutrition (Theory)

Course Code: 0915-IHN-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. Split answers are strongly discouraged.)

SECTION-A

1. Define human nutrition. Depict the nutrition throughout life cycle. 2+3
2. a) Define exclusive breast-feeding. Write down the advantages of breastfeeding. 02
b) Define complementary feeding. When a mother should start the complementary feeding. 2+2
c) Write down the dietary preferences for infants and young children. 04
3. a) What are the determinants of health? 02
b) Distinguish between the growth and development of a person. 03
c) Discuss the different factors and significance of nutrients for human growth and development. 05
4. a) What do you mean by a balanced diet? 02
b) List out the factor of preparing a balanced diet for an individual. 02
c) How does malnutrition jeopardize human health? Elucidate your opinions regarding this.
5. a) Define geriatric nutrition. 02
b) List out some antioxidant nutrients and antiaging foods for senior citizen. 03
c) Which nutrients demand increased in elderly people? State the roles of dietary fiber for the sound health of elderly people. 3+2

SECTION-B

6. a) Who are more vulnerable to developing malnutrition? 02
b) Do you think human milk is better than cow's milk? If yes, then why? 03
7. a) Describe the importance of colostrum for a child's health. 05
b) Outline the conceptual framework of malnutrition. 05
8. a) What is eating disorder? 02
b) Give a detailed overview of the nutritional requirements along with psychosocial issues throughout the pregnancy period. 06
c) What is Body Mass Index (BMI) and Basal Metabolic Rate (BMR)? 02
9. a) Define LBW, SGA and IUGR. 03
b) Outline the causes and consequences of low birth weight. 05
c) How can you take care of a pre-term baby with birth weight 2 kg only? 02
10. a) Define hidden hunger and PEM. Who are the most vulnerable to hidden hunger and PEM? 3+3
b) What do you understand by Barker hypothesis? How do you overcome the low birth weight consequences for developing country? 2+2

BFST 1st Year 1st Semester Final Examination-2023**Course Title: Inorganic Chemistry (Theory)****Course Code: 0531-ICM-101(T)****Full Marks: 70, Time: 3 Hours**

(Figures in the right margin indicate full marks. Answer **Four (04)** questions from each section, where question No. **1** and **6** are compulsory. Use separate answer script for each section. Split answers are strongly discouraged.)

SECTION-A

1. a) Define Inorganic Chemistry. List down some of the inorganic compounds those can be found in food. 03
b) Classify inorganic compounds. 02
2. a) Differentiate between oxidation number and valency. 02
b) "Oxidation and reduction happen simultaneously"- Justify the statement. 04
c) Balance and complete the following equation- 04
$$K_2Cr_2O_7 + H_2SO_4 + FeSO_4 \rightarrow K_2SO_4 + Cr_2(SO_4)_3 + Fe_2(SO_4)_3$$
3. a) Reproduce the manufacture of Na_2CO_3 on large scale by Solvay process. 05
b) Compare the characteristics of alkali metal and alkali earth metal. 03
c) List the use of potassium. 02
4. a) How does a pH indicator function? Explain with suitable example. 03
b) Calculate the pH of 0.1M solution of -
i) CH_3COOH 02
ii) H_2SO_4
c) What do you mean by buffer solution? Discuss the mechanism of buffer action with example. 05
5. a) Describe the Lewis concept of acids and bases. 03
b) Why the aqueous solution of NaCl is neutral where as that of $AlCl_3$ is acidic? 03
c) Prove that the degree of dissociation of weak electrolytes like weak acid and bases is inversely proportional to the square root of concentration of that electrolyte. 04

SECTION-B

6. a) What is pH? What is the molar concentration of $[H^+]$ of a neutral solution? 02
b) What is the $[H^+]$ of human saliva if its $[OH^-]$ is 4×10^{-8} M? Is human saliva acidic, base or neutral? 03
7. a) Design the experimental setup to prove the presence of nucleus in atom. 03
b) Rewrite Rutherford's atomic model. 04
c) Mention the properties of positive rays. 03
8. a) Why inert gases are inert chemically? Write down the uses of Ne. 03
b) Outline the separation techniques of inert gases from gas mixture. 04
c) Describe the Bosch's process for hydrogen production. 03
9. a) Define primary standard substance with example. 02
b) Differentiate between atomic emission and absorption spectroscopy. 04
c) What is chromatography? Discuss the principle of thin layer chromatography. 04
10. Write short note on- 3.5+3.5+03
i) Coordinate bond
ii) Dipole-dipole moment
iii) Chemical properties of Aluminium

Chattogram Veterinary and Animal Sciences University

BFST 1stYear 1st Semester Final Examination, 2023

Course Title: Human Biology (Theory)

Course Code: 0511-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. Split answers are strongly discouraged.)

SECTION-A

1. "Human survival depends on homeostasis" – justify the statement. 05
2. a) Discuss the role of organelles such as the Mitochondria, Endoplasmic reticulum, and Golgi apparatus in cellular function. 05
b) Illustrate the structure and function of the nucleus in the cell. 05
3. a) Discuss the functions of the lymphatic system, including lymphatic vessels, lymph nodes, and lymphatic organs. 05
b) Describe the process of blood clotting, including the role of platelets and clotting factors. 05
4. a) Describe the composition and function of saliva. 05
b) How does alimentary system work during digestion and absorption of protein 05
5. a) What is the functional unit of kidney? 01
b) Define GFR. What are the factors affecting GFR? 1+3
c) Give a brief outline of urine formation, concentration and acidification. 05

SECTION-B

6. a) Explain the difference between voluntary and involuntary muscle contraction, providing examples of each. 05
7. a) Write down the significance of respiratory system in human life. 03
b) Describe the CO₂ transport mechanism from tissue to the lung with symbolic diagram. 07
8. a) Define diuresis. What are the causes and clinical consequences of diuresis? 1+4
b) How many types of tissues are there in human body? Briefly describe about their functions. 2+3
9. a) What is puberty? Write down the factors that influence the onset of puberty. 1+2
b) List the name of male and female reproductive hormones. 02
c) Describe the mechanism of ovarian cycle with flow diagram. 05
10. Write short notes on : 5*2
 - a) Digestive Juice.
 - b) Negative feedback mechanism.
 - c) Succus entericus.
 - d) RBC.
 - e) ABO system of blood.

(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 answers are strongly discouraged.)

SECTION-A

- | | | |
|----|---|-----|
| 1. | Define anti-nutrients. Analyze the contribution of food science in our daily life. | 1+4 |
| 2. | a) Define dietary fiber. How dietary fiber reduces the risk of heart disease? | 04 |
| | b) Explain the assessment of protein quality. | 03 |
| | c) Write down the symptoms and manifestations of CHO deficiency. | 03 |
| 3. | a) Discuss the function of protein. | 04 |
| | b) Classify protein based on their nutritional quality with examples. | 03 |
| | c) How proteins help in maintaining fluid and electrolyte balance? | 03 |
| 4. | a) What is lipid? Why saturated fats are harmful to our health? | 1+3 |
| | b) Summarize some function of fats. | 03 |
| | c) Explain why oil is liquid state in room temperature whether fat is solid. | 03 |
| 5. | a) Define food security with its components. | 02 |
| | b) Write the biological function, food sources, and daily requirement of the following minerals:
i) Calcium ii) Potassium iii) Iodine iv) Iron | 4*2 |

SECTION-B

- | | | |
|-----|--|-----|
| 6. | What do you mean by Cis and Trans-fat? How does trans-fat affect human health? | 05 |
| 7. | a) Diagram the one carbon metabolism with explanation. | 05 |
| | b) Dramatize the absorption process of vitamin B-6 in human body. | 05 |
| 8. | a) Define functional and nutraceutical food. | 02 |
| | b) Outline the hormonal signal from different organ during food intake-feedback regulation. | 04 |
| | c) Briefly explain the components of energy expenditure. | 04 |
| 9. | a) Define the term hunger, appetite, satiation and satiety using the feeding cycle. | 04 |
| | b) What is diverticulosis? How dietary fiber help to reduce diverticulosis? | 04 |
| | c) Categorize the different type of dietary fiber. | 02 |
| 10. | a) What is pigments? | 01 |
| | b) Classify the different types of pigments. | 03 |
| | c) Name three main volatile compounds of below listed fruits.
i) Apple ii) Banana iii) orange | 3*2 |