Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 1st Year 1st Semester Final Examination 2019
Course Title: Communicative English (Theory)
Course Code: ENG – 101

Full Marks: 35 **Time: 2 hours**

(Figures in the right margin indicate full marks. **Answer ALL the questions** from each section. Use separate answer script for each section. **Split answer is strongly discouraged**.)

SECTION-A

1. Fill in the gaps to make complete sentences. 5

a) Please wait here _____ I come.
b) If I were a king I _____ rule the kingdom peacefully.
c) It's not possible to gain success _____ working.
d) She _____ got a job before you helped her.
e) It has been raining ceaselessly _____ morning.

2. Correct the following sentences if they are incorrect. If the sentence is correct, just copy it. 5

a) Only ten months is required for accomplishing such a task.
b) We have gathered many informations from the internet.
c) Twenty per cent sugar have gone missing.
d) Harry Potter is one of those character that is popular with teenagers.
e) If he had a lot of money, he would have travelled around the globe.

3. Recurrent fire incidents in Bangladesh have become talk of the town in recent months. Experts say that negligence in ensuring fire safety measures and rampant breach of the existing building law and code are increasing fire incidents in the cities of the country. Suppose you are concerned about the frequent fire incidents in Bangladesh. Now, write a letter to the editor of an English daily stating your concern. 7

SECTION-B

4. Change the following sentences as directed. 5

a) He will be surprised if he is offered the job. (Change the voice.)
b) One's behaviour reveals one's character. (Change the voice.)
c) "I will see you tomorrow", said the little girl to her mother. (Change the speech.)
d) John wanted to know from Sara if she knew the man who had come the previous day. (Change the speech.)
e) Achieving success is not difficult. One's hard work is the condition. (Join the sentences into a complex sentence.)

5. Write a paragraph of about 150 words on "Ways to improve English skill". 5

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

Chronobiology might sound a little futuristic – like something from a science fiction novel, perhaps – but it's actually a field of study that concerns one of the oldest processes life on this planet has ever known: short-term rhythms of time and their effect on flora and fauna.

This can take many forms. Marine life, for example, is influenced by tidal patterns. Animals tend to be active or inactive depending on the position of the sun or moon. Numerous creatures, humans included, are largely diurnal – that is, they like to come out during the hours of sunlight. Nocturnal animals, such as bats and possums, prefer to forage by night. A third group are known as crepuscular: they thrive in the low-light of dawn and dusk and remain inactive at other hours.

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This can take many forms. Marine life, for example, is influenced by tidal patterns. Animals tend to be active or inactive depending on the position of the sun or moon. Numerous creatures, humans included, are largely diurnal – that is, they like to come out during the hours of sunlight. Nocturnal animals, such as bats and possums, prefer to forage by night. A third group are known as crepuscular: they thrive in the low-light of dawn and dusk and remain inactive at other hours.

When it comes to humans, chronobiologists are interested in what is known as the circadian rhythm. This is the complete cycle our bodies are naturally geared to undergo within the passage of a twenty-four hour day. Aside from sleeping at night and waking during the day, each cycle involves many other factors such as changes in blood pressure and body temperature. Not everyone has an identical circadian rhythm. 'Night people', for example, often describe how they find it very hard to operate during the morning, but become alert and focused by evening. This is a benign variation within circadian rhythms known as a chronotype.

Scientists have limited abilities to create durable modifications of chronobiological demands. Recent therapeutic developments for humans such as artificial light machines and melatonin administration can reset our circadian rhythms, for example, but our bodies can tell the difference and health suffers when we breach these natural rhythms for extended periods of time. Plants appear no more malleable in this respect; studies demonstrate that vegetables grown in season and ripened on the tree are far higher in essential nutrients than those grown in greenhouses and ripened by laser.

Knowledge of chronobiological patterns can have many pragmatic implications for our day-to-day lives. While contemporary living can sometimes appear to subjugate biology – after all, who needs circadian rhythms when we have caffeine pills, energy drinks, shift work and cities that never sleep? – keeping in synch with our body clock is important.

The average urban resident, for example, rouses at the eye-blearing time of 6.04 a.m., which researchers believe to be far too early. One study found that even rising at 7.00 a.m. has deleterious effects on health unless exercise is performed for 30 minutes afterward. The optimum moment has been whittled down to 7.22 a.m.; muscle aches, headaches and moodiness were reported to be lowest by participants in the study who awoke then.

Once you're up and ready to go, what then? If you're trying to shed some extra pounds, dieticians are adamant: never skip breakfast. This disorients your circadian rhythm and puts your body in starvation mode. The recommended course of action is to follow an intense workout with a carbohydrate-rich breakfast; the other way round and weight loss results are not as pronounced.

Morning is also great for breaking out the vitamins. Supplement absorption by the body is not temporal-dependent, but naturopath Pam Stone notes that the extra boost at breakfast helps us get energised for the day ahead. For improved absorption, Stone suggests pairing supplements with a food in which they are soluble and steering clear of caffeinated beverages. Finally, Stone warns to take care with storage; high potency is best for absorption, and warmth and humidity are known to deplete the potency of a supplement.

After-dinner espressos are becoming more of a tradition – we have the Italians to thank for that – but to prepare for a good night's sleep we are better off putting the brakes on caffeine consumption as early as 3 p.m. With a seven hour half-life, a cup of coffee containing 90 mg of caffeine taken at this hour could still leave 45 mg of caffeine in your nervous system at ten o'clock that evening. It is essential that, by the time you are ready to sleep, your body is rid of all traces.

Evenings are important for winding down before sleep; however, dietician Geraldine Georgeou warns that an after-five carbohydrate-fast is more cultural myth than chronobiological demand. This will deprive your body of vital energy needs. Overloading your gut could lead to indigestion, though. Our digestive tracts do not shut down for the night entirely, but their work slows to a crawl as our bodies prepare for sleep. Consuming a modest snack should be entirely sufficient.

Questions (a—d) 4×1=4

Do the following statements agree with the information given in the 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

Statements:

a) The rise and fall of sea levels affect how sea creatures behave.

b) Most animals are active during the daytime.

c) A 'night person' can still have a healthy circadian rhythm.

d) New therapies can permanently change circadian rhythms without harm.

Questions (e—h) 4×1=4

Chose the correct letter, A, B, C or D.

e) In order to lose weight, we should
   A. Avoid eating breakfast
   B. Eat a low carbohydrate breakfast
   C. Exercise before breakfast
   D. Exercise after breakfast

f) Which is NOT mentioned as a way to improve supplement absorption?
   A. Avoiding drinks containing caffeine while taking supplements
   B. Taking supplements at breakfast
   C. Taking supplements with foods that can dissolve them
   D. Storing supplements in a cool, dry environment

g) In the evening we should
   A. Stay away from carbohydrates
   B. Stop exercising
   C. Eat as much as possible
   D. Eat a light meal

h) Which of the following best describes the main aim of the passage?
   A. To suggest healthier ways of eating, sleeping and exercising
   B. To describe how modern life has made chronobiology largely irrelevant
   C. To introduce chronobiology and describe some practical applications
   D. To plan a daily schedule that can alter our natural chronobiological rhythms

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 1st year 1st Semester Final Examination 2019
Subject: Mathematics-I (Theory)
Course Code: MTH-101(T)

Full Marks: 70.0 **Time: 3 hours**

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

Section-A

1. a) Let $f(x)=(x-1)^3(x-5)$ 7
   (i) Where does the f(x) has inflection points?
   (ii) Find the local maxima and minima of the function f(x).
   (iii) Describe concavity of the function f(x).

2. a) Find the domain and range of the function $f(x)=3+e^{-x}$. 2
   b) A function f(x) is defined as follows: 5

$$f(x)=\begin{cases} 3+2x; & -\frac{3}{2}\le x<0 \\ 3-2x; & 0\le x<3/2 \\ -3-2x; & x\ge 3/2 \end{cases}$$

   Show that f(x) is continuous at x=0 and discontinuous at x=3/2.

3. a) Solve the following linear system using row echelon form: 4
   3x-2y+3z=1
   2x+3y+z=3
   x+y+3z=2

   b) Find the inverse of the following matrix using identity matrix: 3

$$\begin{bmatrix} 2 & 3 & 1 \\ 3 & 2 & 1 \\ 4 & 2 & 1 \end{bmatrix}$$

4. a) Integrate followings: 4
   (i)

$$\int_0^{\pi/3} \frac{\cos x\, dx}{3+4\sin x}$$

   (ii)

$$\int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x}+\sqrt{\cos x}}\, dx$$

   b) Evaluate $\int_0^1 y^5(1-y^2)^{4/3}dy$ 3

5. a) Define partial differentiation. Find the partial differentiation of $z=\sin(x^2+4)$ with respect to x. 4
   b) Prove that $\sqrt{n+1}=\underline{\lfloor n}$ 3

6. a) Write down the relation between gamma and beta function. 4
   b) Define improper integral of 1st kind. Test the convergence of the following integral: 3

$$\int_2^{\infty} \frac{x^2-1}{\sqrt{x^6+16}}\, dx$$

Section-B

7. a) Find the three terms of Maclawrin's series of the function $f(x)=\frac{\cos x}{x}$ 4
   b) What is skew hermitian matrix? Show whether the following matrix is skew hermitian or not 3

$$\begin{bmatrix} i & -3+4i & 2+i \\ 3+4i & 0 & -1-i \\ -2+i & 1-i & 4i \end{bmatrix}$$

8. a) Let $y=\frac{\log x}{x}$,then find y_n using Leibnitz theorem. 4

b) Determine the number of real equation of $4x^7+3x^6-x^5+2x^4-x^3+9x^2+x+1=0$ using Descartes rule of sign. 3

9. a) Establish relation between direction ratio and direction cosine. 3

b) Calculate the shortest distance between the following pair of lines: 4

$$\frac{x+3}{3}=\frac{y-1}{5}=\frac{z+3}{4}$$

$$\frac{x+1}{1}=\frac{y-4}{1}=\frac{z-5}{2}$$

10. a) Does the equation $2x^2+5xy+3y^2-9x-11y+10=0$ represents a pair of straight line? If so find the angle between them. 3

b) Define axis of revolution. Find the volume of solid that is obtained by revolving the region enclosed by $y=\sqrt[3]{x}$ and $y=\frac{x}{4}$ about the y-axis. 4

11. a) Write down the condition of Rolle's theorem. Verify the mean value theorem for the function of $f(x)=\ln(x^2+2x+4)$ on the interval of $[-4,3]$. 4

b) Justify the continuity of f(x) at x=-2 3

$$f(x)=\begin{cases} x^2+2x; if x \leq 2 \\ \\ x^3-6x; if x > -2 \end{cases}$$

12. a) Determine whether the following integral is convergent or divergent. If it is convergent then find its value. 4

$$\int_{-\infty}^{\infty} e^{-x^2}\,dx$$

b) Evaluate $\int \frac{1}{\sqrt{4-9x^2}}\,dx$ 3

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 1st year 1st Semester Final Examination, 2019
Course Title: Inorganic Chemistry (Theory)
Course Code: ICM-101

Full Marks: 70 **Time: 3 hours**

[Figures in the right margin indicate Full Marks. Answer any **4 (Four) questions** from each section where **question no. 1 & 6 are compulsory**. Use separate answer scripts for each section. **Split answer is strongly discouraged**.]

SECTION-A

1. a) Briefly discuss the inert gases with their properties. 05

2. a) Define hydrogen bond with bonding structure. 02
   b) Show the hydrogen bonding in ammonia. 03
   c) Discuss Lane's process and Bosch process to produce hydrogen. 05

3. a) What do you mean by oxidation number? 02
   b) Find the oxidation number of central atoms of the following substances: 04
   $KMnO_4$, $K_2Cr_2O_7$, ClO_4^-, HCN
   c) Prove the statement "Oxidation and Reduction reactions occur at the same time." 04

4. a) Discuss the comparative properties of alkali metal in periodic table. 04
   b) Discuss the production process of soda ash by solvery process with a flow diagram. 06

5. a) Write down some uses of Tritium. 02
   b) Illustrate intermolecular and intramolecular hydrogen bond. Why is the melting point of meta/pera nitro phenol greater than ortho nitro phenol? 04
   c) Justify the position of hydrogen in the periodic table. 04

SECTION-B

6. a) Define buffer solution. Explain the mechanism of buffer solution. 05

7. a) Write down the sources of Mg and Ca. 03
   b) Describe the extraction process of Ca from carnalite ores. 04
   c) Write down some uses of boron and boric acid. 03

8. a) Give an account of compounds of carbon. 03
   b) Discuss about "Nitrogen Fixation". 03
   c) Write down the uses of the following compounds: 04
   H_2SO_4, HNO_3, Ca, Cl_2

9. a) Define variable covalency. 02
   b) Discuss the separation of inert gases from their mixture by coconut charcoal method. 04
   c) Explain the formation of coordination bond of H_2O_2 and Al_2Cl_6 molecules. 04

10 a) Explain Drude and Laurentz theory of metallic bond. 05
   b) Balance the following redox reaction by ion-electron method: 05
   $FeSO_4 + KMnO_4 \rightarrow Fe_2(SO_4)_3 + MnSO_4$

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 1st year 1st Semester Final Examination 2019
Subject: Elementary Food Science (Theory)
Course Code: EFS-101

Full Marks: 70 **Time: 3 hours**

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

Section-A

1.	a)	Define food science.	1
	b)	Analyze the contribution of food science in our daily life.	4
2.	a)	Define enzyme and hormone with their functions.	3
	b)	Classify protein based on their nutritional quality with examples.	3
	c)	Discuss the functions of protein.	4
3.	a)	What is mineral? Classify it with example.	1+1=2
	b)	Write down the biological functions, food sources and daily requirements of the following minerals i)Calcium ii) Sodium iii) Iron v) Phosphorus	8
4.	a)	Define dietary fiber. How dietary fiber reduces the risk of heart disease?	4
	b)	Explain the concept of GI and GL.	3
	c)	Write down the symptoms and manifestations of CHO deficiency.	3
5.	a)	What are fats and oils? Differentiate between saturated and unsaturated fat.	4
	b)	Classify fatty acid present in fats and oils.	3
	c)	Write down the health benefits of PUFA.	3

Section-B

6.	a)	Give some examples of B-vitamins act as co-enzyme to promote energy metabolism	5
7.	a)	Discuss on natural pigments present in fruits and vegetables.	4
	b)	Define phyto-protectant. Write down its health claim in aspect of human nutrition	3
	c)	Explore the concept of prebiotic and probiotic.	3
8.	a)	Show the process of converting sunlight into vitamin-D in our skin.	3
	b)	Write the chemical name, deficiency disease and toxicity of vitamin-B_6, B_9 and vitamin-A.	3
	c)	Give an overview about the maintenance of blood glucose in our body.	4
9.	a)	Define the term hunger, appetite, satiation and satiety using the feeding cycle	4
	b)	What is molecular gastronomy? Summarize your activities as a food scientist.	3
	c)	List out the functions of water in our body.	3
10.	a)	How chlorophylls and anthocyanin changes during processing?	3
	b)	Classify vitamins.	3
	c)	Discuss about Wald's vision cycle.	4

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 1st year 1st Semester Final Examination 2019
Subject: Introductory Human Nutrition (Theory)
Course Code: IHN-101

Full Marks: 70 **Time: 3 hours**

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

Section-A

1.	a)	Define nutrition and human nutrition.	2
	b)	"Nutrition must be considered if we think of food"-explain it.	5
2.	a)	Define child's nutrition.	1
	b)	What are the household factors affect child's nutrition?	2
	c)	Discuss the common health problems occurred among school going children.	4
3.	a)	What is complementary feeding?	1
	b)	Differentiate between complementary and supplementary feeding.	3
	c)	Write down the guidelines of complementary feeding.	3
4.	a)	What is aging?	1
	b)	List the nutrition related problems of elderly people.	2
	c)	How do you modify elderly people's diet?	4
5.	a)	Demonstrate the hormonal changes during pregnancy.	3
	b)	Describe about the heartburn and pica. What are ways to relieve from heartburn?	1+1+2=4
6.	a)	Summarize the process of stimulation of human milk production.	4
	b)	Write down the benefits of breastfeeding.	3

Section-B

7.	a)	Define weaning. Why is weaning time dangerous for a baby?	1+2=3
	b)	Interpret the complementary feeding guidelines given by WHO.	4
8.	a)	Diagram the conceptual framework for the cycle of malnutrition and infection by WHO.	5
	b)	Indicate the effects of alcohol, caffeine, drugs and tobacco during pregnancy.	2
9.	a)	"Binge eating is eating disorder rather than a disease"-explain.	3
	b)	Classify anorexia nervosa. Assess the risk factors associated with anorexia nervosa.	2+2=4
10.	a)	Why is protein energy malnutrition common among infants?	2
	b)	Differentiate between marasmus and kwashiorkor.	3
	c)	What is anemia? Write down some signs and symptoms of anemia.	1+1=2
11.	a)	Identify low birth weight infants along with their classification.	3
	b)	Conclude the neonatal complications of low birth weight infant.	4
12.	a)	Illustrate the maternal micronutrient malnutrition and its effects on infant growth and development.	4
	b)	Mention the composition of human milk and cow milk.	3

Chittagong Veterinary and Animal Sciences University
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BFST 1st year 1st Semester Final Examination 2019
Subject: Human Biology (Theory)
Course Code: HBL-101

Full Marks: 70 **Time: 3 hours**

(Figures in the right margin indicate full marks. Answer any **4** 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.		Write the important organelles of cell? Discuss their functions briefly.	1+4
2.	a)	Define and classify tissue. Differentiate between epithelial and connective tissue.	5
	b)	Which organ is responsible for maintaining blood glucose level in human body? Shortly describe about different types of pancreatic secretion.	5
3.	a)	Draw and label the unit of urinary system and write its functions.	5
	b)	Give a brief outline of urine formation, concentration and acidification.	5
4.	a)	Draw and label of heart. Write the functions of heart shortly.	5
	b)	Define spermatogenesis? Briefly discuss the formation of sperm from the primitive germ cell.	5
5	a)	Enumerate the functional organization of human body.	3
	b)	Summarize the parts of eukaryotic cell.	4
	c)	Write down the composition and functions of cell membrane.	3

Section-B

6.	a)	Why white blood cells are called soldiers of the body?	2
	b)	Classify granulocytes according to the type of stain they intake.	3
7.	a)	Why does total body water decrease with age?	1
	b)	Sketch out the body fluid distribution in human body.	4
	c)	Explain the renal-body fluid feedback mechanism of water balance.	5
8.	a)	What are the major intracellular and extracellular electrolytes?	3
	b)	How does sodium regulate water in the body?	4
	c)	Give the outline of cardiovascular system components.	3
9.	a)	How does homeostasis maintained when blood vessels ruptured?	3
	b)	Explain the two pathways involved in blood clotting.	4
	c)	Enlist the digestive juice with their daily secretion and pH.	3
10.	a)	Enlist the composition and functions of saliva.	4
	b)	Classify proteolytic enzyme with example.	1
	c)	How does body digest and absorb protein? Explain it with figure.	5

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 1st year 1st Semester Final Examination 2019
Subject: Physics-I (Theory)
Course Code: PHC-101(T)

Full Marks: 70.0 **Time: 3 hours**

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

Section-A

1. a) Derive Bernoulli's equation. 5
   b) A Pitot tube is fixed on the wing of an aeroplane to measure the speed of the aeroplane. The tube contains a liquid of density 800 kg/m^3. The difference in level between the two limbs is 0.5 m. Density of air is 1.293 kh/m^3. Calculate the speed of the aeroplane. 2

2. a) Describe a method for the determination of the modulus of rigidity of the material of a solid cylinder. Deduce the formula you would use. How will the expression for the moment of couple acting on the cylinder be modified in the case of a hollow cylinder. 7

3. a) Define the terms shearing strain, elastic limit, elastic fatigue and modulus of rigidity. 2
   b) Determine the maximum possible value of Poisson's ratio. 5

4. a) Differentiate isothermal and adiabatic changes. 1
   b) Show that for an adiabatic changes in perfect gas PV^γ =constant, and also work done in adiabatic expansion of an ideal gas for a state P_1V_1 to P_2V_2 is given by $W=\frac{1}{\gamma\ 1}(P_1V_1 - P_2V_2)$, Where the symbols have their usual meanings. 6

5. a) The modulus of rigidity and Poisson's ratio of the material of a wire are $2.87\text{x}10^{10}$ N/m^2 and 0.379 respectively. Find the value of Young's modulus of the material of the wire. 2
   b) Discuss the various forms of energy possessed by liquid in motion. 2
   c) State and explain rate of flow of a liquid. Discuss equation of continuity. 3

6. a) Write short note on: (i)Viscosity (ii) Surface tension 4
   b) Show that numerically surface tension is equal to surface energy. 3

Section-B

7. a) State and explain the second law of thermodynamics. 3
   b) Draw the temperature-entropy diagram for Carnot cycle and hence, from it, find the efficiency of Carnot engine. 4

8. a) Show that the excess of pressure inside a soap bubble is 4T/r, where T is the surface tension and r is the radius of the bubble. 5
   b) Discuss the term angle of contact. 2

9. a) Give the theory and method of determining the surface tension of water by capillary rise. 5
   b) Explain why the level of water rises while that of mercury depressed in a capillary tube. 2

10. a) State and explain Avogadro's hypothesis. 3
    b) Show that the mean kinetic energy of a molecule is directly proportional to the absolute temperature of a gas. 4

11. a) Show that pressure exerted by a perfect gas is 2/3 of the mean kinetic energy per unit volume. 6
    b) Briefly explain the term mean free path. 1

12. a) What are the factors affect the velocity of sound? Explain. 3
    b) Derive the Newton-Laplace equation for the velocity of sound in air. 4