

**Chittagong Veterinary and Animal Sciences University**  
**Faculty of Food Science and Technology**  
**BFST 1<sup>st</sup> Year 1<sup>st</sup> Semester Final Examination, 2013**  
**Subject: Communicative English**  
**Course Code: ENG-101**

**Full Marks: 35** **Time: 2 (two) hours**  
(Figures in the right margin indicate full marks. Answer ALL the questions. Use separate answer script for each section.)

**SECTION: A**

1. **Use the right form of verbs in the following sentences:** 5
- a) The boy (suffer) from fever for five days.
  - b) If I were a bird, I (fly) in the sky.
  - c) You had better (have) a haircut.
  - d) I would not mind (have) a cup of tea.
  - e) She is used to (take) a cup of coffee every morning.
2. **Change the voice of the following sentences:** 5
- a) Somebody calls the president everyday.
  - b) John is calling the other members.
  - c) The fire has caused considerable damage.
  - d) The manager should sign these contracts today.
  - e) John will have received the papers by tomorrow.
3. **Complete the following sentences:** 5
- a) Unless you start at once, -----
  - b) Drink pure water if -----
  - c) ----- because she showed negligence to her study.
  - d) ----- until the train stops.
  - e) I saw him when -----
4. **Turn the following into indirect speech:** 3
- Mr Fox said, "You'll look nice and clean if you cut off your tails with knife. I have used it myself." "You didn't use a knife." said the wise old Fox. "You fell into a trap and lost your tail."

**SECTION: B**

5. **Join the following sentences as directed:** 5
- a) The thief jumped out of the window. The thief ran away instantly. (present participle)
  - b) You can keep fit. But taking exercise regularly is the condition. (provided that)
  - c) He plays football. He plays cricket too. (not only .... but also)
  - d) My brother went to India. He wanted to visit Taj Mahal. (in order to)
  - e) She was late. The teacher rebuked her for that reason. (since)
6. **Write a letter to the editor of an English daily mentioning the suffering of the people of your city due to poor drainage system.** 5
7. **Write a paragraph on any one of the following:** 7
- a) Social Network
  - b) Air Pollution



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**Section: A**

1. a) Why cell is called the basic unit of life? 2  
b) Differentiate between plant cell and human cell. 2  
c) Draw and label the structure of nucleus of a cell with its function. 3
2. a) Define immunity. What are the types of immunity? 2  
b) Explain the mode of action of antibody in our body's defense system. 3  
c) What are the functions of neutrophil and lymphocyte? 2
3. a) What is neuron? Draw and level a typical neuron. 2  
b) Classify nervous system. 2  
c) What is reflex? What are the components needed for monosynaptic reflex? 3
4. a) What are the primary and accessory sex organs of reproductive system in male and female? 3  
b) Briefly state the hormonal control of spermatogenesis. 4
5. a) What is semen? Write down the composition of semen. 3  
b) What is ovulation? How does ovulation occur? 4
6. a) Define and classify respiration. List the organs of respiration. 4  
b) Write down the functions of lungs in details. 3

**Section-B**

7. a) List the different parts of digestive tract of a person. Write down some enzymes and hormones that are involved in digestion. 3  
b) Briefly describe the digestion of protein. 2  
c) Write down the functions of bile. 2
8. a) Define hormone with example. Classify hormone on the basis of chemical nature. 3  
b) Differentiate between hormone and enzyme. 2  
c) Briefly discuss the functions of T<sub>3</sub> and T<sub>4</sub>. 2
9. a) List the organs of urinary system with their functions. 4  
b) What is urine? What is the normal daily production of urine? 3
10. a) Define blood Coagulation. 2  
b) Discuss the mechanism of blood coagulation. 2  
c) What are the essential factors for blood coagulation? Why are they call essential? 3
11. a) What are the types of blood circulation? 2  
b) Draw and label the different parts of a heart in its mid coronal section. 3  
c) What are the properties of heart muscles? 2
12. Write short notes on any two: 3.5x2= 7



**Chittagong Veterinary and Animal Sciences University**  
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**BFST 1<sup>st</sup> Year 1<sup>st</sup> Semester Final Examination, 2013**  
**Subject: Physics-I (Theory)**  
**Course Code:PHC-101**

**Full Marks: 70**

**Time: 3 Hours**

(Figures in the right margin indicate full marks. Answer Any **Four (4)** questions from each section where question **1** and **6** are compulsory. Use separate answer script for each section. **Split answer is not allowed**)

**Section: A**

1. a) What do you mean by Elastic and Plastic substances? Draw a typical Stress-Strain graph indicating Proportional limit, Elastic limit, Yielding point, Tensile strength and Breaking point. 3
- b) How can you differ a ductile material from a brittle material in terms of stress-strain relationship? 2
2. a) Write the physical significance of surface tension in our daily life. 3
- b) Show that the surface tension of a liquid is equal to the mechanical part of its surface energy. 3
- b) Show that the excess pressure inside a soap bubble of radius 'r' over the atmospheric pressure outside it is equal to  $\frac{4T}{r}$  where T is the surface tension of the soap solution. How may the surface tension of a bubble be determined? 4
3. a) State and explain principle of continuity for fluid flow. 4
- b) Water stands at a depth 'H' in a large open tank whose side walls are vertical. A hole is made in one of the walls at a depth 'h' below the water surface. Find 6
  - i) The velocity of Efflux
  - ii) At what distance 'R' from the foot of the wall does the emerging stream of water strike the floor?
  - iii) At what height above the bottom of the tank could a hole be cut so that the stream emerging from it would have the maximum range?
4. a) Define thermal conductivity and thermal resistance. 2
- b) Derive Fourier equation for one dimensional flow of heat. 6
- c) The underground temperature in a sandstone district increases  $2^{\circ}C$  for 30 metres descent. Calculate the heat lost per minute by a square kilometre area of the earth's surface in that district. (Conductivity of sandstone is  $0.0025 \text{ cal cm}^{-1} \text{ }^{\circ}C^{-1} \text{ sec}^{-1}$ ) 2
5. a) Obtain a general solution for the differential equation of simple harmonic oscillator. 4
- b) Show that the total mechanical energy of a simple harmonic oscillator is constant and is proportional to the square of the amplitude. 4
- c) The position of a particle executing simple harmonic motion along the x- axis are  $x=A$  and  $x=B$  at time t and 2t, respectively. Show that its period of oscillation is given by 2

$$T = \frac{2\pi}{\cos^{-1}\left(\frac{B}{2A}\right)}$$



## Section-B

6. a) What do mean by the term 'Degrees of freedom' for gas molecules? Calculate the molar specific heat ratios for monoatomic, diatomic and polyatomic gas molecules. 4
- b) State Maxwell's Equipartition of Energy Theorem. 1
7. a) Derive an expression for the moment of couple required to twist one 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. 6
- b) Establish a relationship between Bulk modulus and Rigidity modulus in terms of Poisson's ratio for elastic substances. Show from the first principle that Poisson's ratio lies between -1 to 0.5. 4
8. a) Derive an expression for the terminal velocity of a body falling through a viscous medium. 4
- 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 6
9. a) State Carnot's theorem. For Carnot's reversible cycle show that  $\frac{Q_1}{Q_2} = \frac{T_1}{T_2}$  5
- b) Establish a relationship between molar specific heat at constant pressure and molar specific heat at constant volume for an ideal gas. 3
- c) A Carnot engine whose low temperature reservoir is at  $30^\circ C$  has an efficiency of 50%. It is desired to increase the efficiency of 70%. By how many degrees should the temperature reservoir be increased? 2
10. a) When do the gas molecules of Real gas behave more like an ideal gas? 2
- b) Derive the adiabatic equation  $PV^\gamma = \text{constant}$ , where the symbols have their usual meanings. 5
- c) The volume of 1 mol of Argon gas molecules is  $3.219 \times 10^{-2} L$ . What will be the radius of Argon molecule? 3



(Figure in the right margin indicate full marks. Answer Any Five questions from each section. Use separate answer script for each section. Split answer is not allowed)

**Section: A**

1. a) What is Nutrient? Classify nutrient with example. 2  
b) Write down the interrelation between nutrition, health and disease. 3  
c) Explain. Food is important for our life. 2
2. a) What is geriatric nutrition? Discuss the physiological changes in aging. 4  
b) What are the causes of poor nutrition during elderly age. 3
3. a) Define colostrum. Write down the importance of colostrum feeding to a new born baby. 5  
b) Write down the outcome of breast feeding. 2
4. a) What is nutritional status and nutritional assessment? 2  
b) Briefly describe the dietary evaluation method of nutritional assessment. 5
5. a) What is BMI? What type of error does occur and precaution should be taken during weight measurement? 3  
b) What is micronutrient and malnutrition? Write down the comparison between Kwashiorkor and Marasmus. 4
6. a) Define the following terms: 2  
i) Miscarriage ii) Premature birth  
b) Why protein requirements increase during pregnancy? 2  
c) Shortly discuss about special care during pregnancy and lactation. 3

**Section :B**

7. a) What do you mean by LBW? Write down the causes and complication of LBW. 4  
b) Which factors are responsible for VLBW and the consequences of LBW on human life? 3
8. a) Define weaning. Why do we need to start weaning? 3  
b) Narrate the general requirements of weaning food. 2  
c) What type of food should be provided and avoided during weaning? 2
9. a) Mention the macro and micro nutrient requirements during pregnancy. 3  
b) Write down the composition of human milk and cow's milk 4
10. a) Define lactation. What types of key proteins are found in breast milk? 3  
b) What is maternal nutrition? What kind of physiological changes may occur in pregnancy? 4
11. a) Define anthropometry. Write down the advantages and drawback of anthropometry method during nutritional assessment. 4  
b) What do you mean by MUAC? How do you measure MUAC of a child? 3
12. Write down short notes (Any two) : 3.5x2 7  
a) Breast feeding b) Complementary feeding c) Web influences on pregnancy outcome.



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**Section: A**

1. a) What is food? Classify food on the basis of nutrients with examples. 3  
 b) Show the differences between food science and food technology. 2  
 c) Define protein and state the biological functions of protein with examples. 2
2. a) Define hidden hunger? What is the importance of hidden hunger? 2  
 b) Write down the causes, sign-symptoms and treatments of deficiency of any two micronutrients: i. Iron ii. Iodine iii. Vitamin A 5
3. a) What do you mean by Basal Metabolic rate (BMR)? Which factors affect BMR of a person? 5  
 b) Why do people need energy everyday? 2
4. a) What types of diseases are caused by micronutrient deficiencies? 3  
 b) State the social effects of and control measures for micro-nutrient malnutrition. 4
5. a) Define food security. Which groups are at risk of food insecurity? 3  
 b) Explain the phenomenon of hunger, malnutrition and poverty. 2  
 c) What is food safety? List the principles of food safety. 2
6. a) Define food fortification and food enrichment. 2  
 b) Give the classification and approaches of food fortification with example. 3  
 c) Which conditions are followed for a successful fortification programme? 2

**Section: B**

7. a) What is RDA and how to calculate it? 2  
 b) Write down the standard RDA of an adult male and female for a day. 3  
 c) Where RDA is used to achieve its goals? 2
8. a) What is chronic energy deficiency (CED)? 2  
 b) Define human growth and growth failure. Illustrate the variation in growth rate of a human being? 4  
 c) Which glands and hormones are responsible for human growth? 1
9. a) What do you know about eating habit? Which factor influences the food habit of people? 4  
 b) Define glycemia index and classify it? State the list of carbohydrate rich foods which raise blood glucose level. 3
10. a) Why food insecurity occurs at national level? 3  
 b) Write about the food security circumstances in Bangladesh. 4
11. a) What are the sources of vitamin C? 2  
 b) Mention the symptoms of Scurvy and Beriberi. 5
12. Write short notes on any two: 3.5x2= 7  
 a) Loss of nutrients in different conditions b) Milk sugar c) Symbolism of food.



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**Subject: Mathematics-I (Theory)**  
**Course Code: MTH-101**

**Full Marks: 70**

**Time: 3 Hours**

(Figures in the right margin indicate full marks. Answer Four (4) questions from each section where question 1 and 6 are compulsory. Use separate answer script for each section. **Split answer is not allowed**)

**Section: A**

1. a) What are differentiation and integration? 2  
 b) Discuss critical point, inflection point and concavity of a function with example. 3  
 2. a) Draw the graph of the function 5

$$f(x) = \begin{cases} |x|, & x \neq 0 \\ x, & \\ 0, & x = 0 \end{cases}$$

Also find domain and range of the function.

- b) State Leibnitz rule. Use Leibnitz rule to show that 5  
 $(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} - n^2y_n = 0$  where  $y = (\cos^{-1} x)^2$
3. a) Verify Mean-Value theorem for the function  $f(x) = x - x^3$  in the interval  $[-2, 1]$  4  
 b) A closed cylindrical can is to hold 1 litre ( $1000 \text{ cm}^3$ ) of liquid. How should you choose the height and radius to minimize the amount of material needed to manufacture the can? 6
4. a) A mixture is to be made of three foods A, B and C. The three foods A, B, C contain nutrients P, Q, R as shown in the tabular column. How to form a mixture which will have 8 grams of P, 5 grams of Q and 7 grams of R? 6

| Food | Nutrient P(gm/kg) | Nutrient Q(gm/kg) | Nutrient R(gm/kg) |
|------|-------------------|-------------------|-------------------|
| A    | 1                 | 2                 | 5                 |
| B    | 3                 | 1                 | 0                 |
| C    | 4                 | 2                 | 2                 |

- b) What do you understand by singular matrix and non-singular matrix? 2  
 c) Write down the application of linear programming problem. 2
5. a) Describe briefly the graphic method of solving a linear programming problem. 4  
 b) Given the system of linear equations 6
- $$\begin{aligned} 7x + 6y &\leq 42 \\ x + 2y &\leq 10 \\ x \geq 0, y &\geq 0 \end{aligned}$$
- i) Organize the information in a table which are needed to plot the feasible region.  
 ii) Sketch the feasible region.  
 iii) If the objective function is  $z = x + y$ , then find the point where the function is maximum.



## Section B

6. a) Draw the graph of  $e^x$  and  $\log x$ . 2  
 b) Determine the direction cosines of a line which is equally inclined to the axes. 3
7. a) Define Taylor's Series and Maclaurin's series. 2  
 b) Expand the function  $f(x) = x^3 - 10x^2 + 6$  about  $x=3$  using Taylor's Series. 5  
 c) Write down the chain rule for two variables. If  $z = e^{xy}$ ,  $x = 2u + v$ ,  $y = \frac{u}{v}$  then find 3  
 $\frac{\partial z}{\partial u}$  and  $\frac{\partial z}{\partial v}$
8. a) Define direction cosine and direction ratio of a line. 2  
 b) Write down the homogeneous equation of second degree and show that it represents a pair of straight lines. 5  
 c) Find out the lines represented by the equation  $y^3 - xy^2 - 14x^2y + 24x^3 = 0$  3
9. a) Evaluate the following(any two) 3 × 2 = 6  
 i)  $\int \frac{dx}{x^2 \sqrt{4-x^2}}$     ii)  $\int_0^1 x^2 (1-x)^{3/2} dx$     iii)  $\int \frac{dx}{\sqrt{e^x - 1}}$   
 b) Use a double integral to find the area of the region R enclosed between the 4  
 parabola  $y = \frac{x^2}{2}$  and the line  $y=2x$ .
10. a) Define beta and Gamma function. Show that  $\beta(m, n) = \beta(n, m)$ . 3  
 b) State Walli's formula. 2  
 c) Find the area of the surface that is generated by revolving the portion of the 5  
 curve  $y = x^3$  between  $x=0$  and  $x=1$  about x-axis.



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- 12 Write short notes on any two: 3.5x2= 7  
a) Hormonal control of pregnancy b)Functional organization of human body c)Plasma protein



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i) Organize the information in a table which are needed to plot the feasible region.  
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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. Split answer is not allowed)

### Section: A

1. a) Explain the term "Enthalpy". 2  
b) Differentiate true solution, colloidal solution and suspension. 3
2. a) What is thermodynamical equilibrium constant? Derive the expression showing the effect of temperature on chemical equilibrium. 6  
b) The equilibrium constant  $K_p$  for the reaction  $2\text{NH}_3(\text{g}) = 3\text{H}_2(\text{g}) + \text{N}_2(\text{g})$  is  $1.22 \times 10^{-3}$  at 297K and 2.16 at 498K. Calculate  $\Delta H$  for the reaction. 4
3. a) Write a short definition of each of the following terms: i) Rate of a reaction; ii) Order of a reaction; iii) Molecularity of a reaction; iv) Half-life 4  
b) Deduce the rate expression for second-order reaction. 4  
c) The half-life of a substance in a first order reaction is 15 minutes. Calculate the rate constant. 2
4. a) What are colloids? 2  
b) Describe one method for the preparation of colloids with a neat diagram. 5  
c) What is meant by peptization? Give a suitable example. 3
5. a) Write down short notes on: i) Hess's law of constant heat summation; ii)  $K_c$  and  $K_p$  6  
b) Given that energies for H-H, O=O and O-H bonds are 104, 118 and 111 Kcalmol<sup>-1</sup>, respectively. Calculate the heat of reaction:  $\text{H}_2(\text{g}) + \frac{1}{2}\text{O}_2(\text{g}) \longrightarrow \text{H}_2\text{O}(\text{g})$  4

### Section: B

6. a) Define surface tension. What is the effect of temperature on surface tension? 3  
b) What is common ion effect? 2
7. a) How can you determine the molecular weight of a solute from elevation of boiling point? 5  
b) Write down the Raoult's law of depression of freezing point? 2  
c) The vapour pressure of ether (MW=74) is 442 mmHg at 293K. 3g of the compound 'A' is dissolved in 50g of ether and the vapour pressure is reduced to 426 mmHg. Calculate the mol mass of 'A'. Assume that the solution is very dilute. 3
8. a) Define molar conductance, equivalent conductance and specific conductance. What are the effects of concentration on them? 6  
b) Define osmosis and dialysis. Write down the biological importance of osmosis. 4
9. a) Discuss in details the Faradays law of electrolysis. 5  
b) Write down the Arrhenius theory of electrolytic dissociation. 3  
c) Why the mobilities of hydrogen ion and hydroxyl ion in aqueous solution is abnormally high. 2
10. a) Derive the relation between emf and free energy. 5  
b) What is buffer solution? Write down the mechanism of acidic and basic buffer solution. 5