

Chattogram Veterinary and Animal Sciences University
Faculty of Biotechnology and Genetic Engineering
Bachelor of Science (Honours) in Biotechnology and Genetic Engineering
1st Year 1st Semester Final Examination-2025
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 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, copy it. 10×0.5= 5
 - a. The land is belonged to an old lady.
 - b. Open page 50.
 - c. We prefer tea to coffee.
 - d. Five hundreds taka.
 - e. I feel out of sort today.
 - f. It is said that many students are used to cram before examination.
 - g. If I knew that he would come, I would have waited for him.
 - h. English is one of those languages that is spoken across the world.
 - i. The number of students who have enrolled for the course is surprising.
 - j. Ten minutes is given to each speaker.

2. Complete the following sentences: 10×0.5= 5
 - a. Had I seen the church, _____.
 - b. Would you mind _____?
 - c. The train had started before _____.
 - d. He talked as though _____.
 - e. The man will arrive as soon as _____.
 - f. Even though money is money is necessary for life, _____.
 - g. Since health is wealth, _____.
 - h. Chattogram is the place where _____.
 - i. Would you mind _____?
 - j. _____ let alone travelling abroad.

3. Although social media is a great tool for communication, its improper use negatively impacts young people. Suppose you are concerned about how social media is doing young users more harm than good. Write a letter to the editor of an English newspaper stating your concern. 7

Section: B

4. Change the following sentences as directed. 5
 - a) My pen has been stolen. (Change the voice.)
 - b) We work very hard. Succeeding in life is our intention. (Join the sentences into a complex sentence.)
 - c) "Do you know the person who came yesterday?" said the teacher to the students. (Change the speech.)
 - d) I knew the man. (Change the voice.)
 - e) The puzzle is too hard for me to solve. (Make it complex.)

5. Write a paragraph of about 150 words on "The use and abuse of advertisements". 5
6. Read the passage carefully and answer the questions that follow. 8

The History of Salt

Salt is so simple and plentiful that we almost take it for granted. In chemical terms, salt is the combination of a sodium ion with a chloride ion, making it one of the most basic molecules on earth. It is also one of the most plentiful: it has been estimated that salt deposits under the state of Kansas alone could supply the entire world's needs for the next 250,000 years.

But salt is also an essential element. Without it, life itself would be impossible since the human body requires the mineral in order to function properly. The concentration of sodium ions in the blood is directly related to the regulation of safe body fluid levels. And while we are all familiar with its many uses in cooking, we may not be aware that this element is used in some 14,000 commercial applications. From manufacturing pulp and paper to setting dyes in textiles and fabric, from producing soaps and detergents to making our roads safe in winter, salt plays an essential part in our daily lives.

Salt has a long and influential role in world history. From the dawn of civilization, it has been a key factor in economic, religious, social and political development. In every corner of the world, it has been the subject of superstition, folklore, and warfare, and has even been used as currency.

As a precious and portable commodity, salt has long been a cornerstone of economies throughout history. In fact, researcher M.R. Bloch conjectured that civilization began along the edges of the desert because of the natural surface deposits of salt found there. Bloch also believed that the first war – likely fought near the ancient city of Essalt on the Jordan River – could have been fought over the city's precious supplies of the mineral.

In 2200 BC, the Chinese emperor Hsia Yu levied one of the first known taxes. He taxed salt. In Tibet, Marco Polo noted that tiny cakes of salt were pressed with images of the Grand Khan to be used as coins and to this day among the nomads of Ethiopia's Danakil Plains it is still used as money. Greek slave traders often bartered it for slaves, giving rise to the expression that someone was "not worth his salt." Roman legionnaires were paid in salt – a solarium, the Latin origin of the word "salary."

Merchants in 12th-century Timbuktu – the gateway to the Sahara Desert and the seat of scholars – valued this mineral as highly as books and gold. In France, Charles of Anjou levied the "gabelle," a salt tax, in 1259 to finance his conquest of the Kingdom of Naples. Outrage over the gabelle fueled the French Revolution. Though the revolutionaries eliminated the tax shortly after Louis XVI, the Republic of France re-established the gabelle in the early 19th Century; only in 1946 was it removed from the books.

The Erie Canal, an engineering marvel that connected the Great Lakes to New York's Hudson River in 1825, was called "the ditch that salt built." Salt tax revenues paid for half the cost of construction of the canal. The British monarchy supported itself with high salt taxes, leading to a bustling black market for the white crystal. In 1785, the Earl of Dundonald wrote that every year in England, 10,000 people were arrested for salt smuggling. And protesting against British rule in 1930, Mahatma Gandhi led a 200-mile march to the Arabian Ocean to collect untaxed salt for India's poor.

In religion and culture, salt long held an important place with Greek worshippers consecrating it in their rituals. Further, in the Buddhist tradition, salt repels evil spirits, which is why it is customary to throw it over your- shoulder before entering your house after a funeral: it scares off any evil spirits that may be clinging to your back. Shinto religion also uses it to purify an area. Before sumo wrestlers enter the ring for a match – which is, in reality, an elaborate Shinto rite – a handful is thrown into the center to drive off malevolent spirits.

In the Southwest of the United States, the Pueblo worship the Salt Mother. Other native tribes had significant restrictions on who was permitted to eat salt. Hopi legend holds that the angry Warrior Twins punished mankind by placing valuable salt deposits far from civilization, requiring hard work and bravery to harvest the precious mineral. In 1933, the Dalai Lama was buried sitting up in a bed of salt. Today, a gift of salt endures in India as a potent symbol of good luck and a reference to Mahatma Gandhi's liberation of India.

The effects of salt deficiency are highlighted in times of war, when human bodies and national economies are strained to their limits. Thousands of Napoleon's troops died during the French retreat from Moscow due to inadequate wound healing and lowered resistance to disease – the results of salt deficiency.

Do the following statements agree with the information in 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) The first tax on salt was imposed by a Chinese emperor.
- b) Salt is no longer used as a form of currency.
- c) Most of the money for the construction of the Erie Canal came from salt taxes.
- d) A lack of salt is connected with the deaths of many of Napoleon's soldiers during the French retreat from Moscow.

Complete the summary.

Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

Salt is such an e) _____ that people would not be able to live without it. As well as its uses in cooking, this basic mineral has thousands of business f) _____, ranging from making paper to the manufacture of soap. Being a prized and g) _____, it has played a major part in the economies of many countries. As such, salt has not only led to war but has also been used to raise h) _____ by governments in many parts of the world.

Chattogram Veterinary and Animal Sciences University
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Bachelor of Science (Honours) in Biotechnology and Genetic Engineering
1st Year 1st Semester Final Examination-2025
Course Title: Fundamentals of Computer & IT (Theory)
Course Code: 0611-CTT-101 (T)

Full Marks: 35

Time: 2 Hours

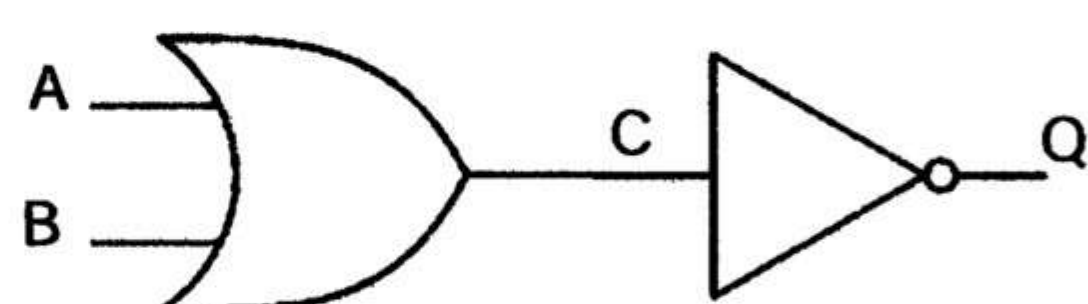
[Figures in the right margin indicate full marks. Answer **Four (4)** questions from each section, where question No. **1** and **6** are compulsory. Use separate answer script for each section. Split answers are strongly discouraged.]

SECTION-A

1. Suppose you want to buy a personal computer. One of your friends gave you some suggestions and told you to consider these before finalizing any computer - 3
 “Brand: Dell/HP
 RAM: 8 GB
 Cache: 512 MB
 Processor: Intel Core i5
 Battery: 4 cells (6 cells will be better)”
 Are these details considered data or information? Explain your answer with suitable reasoning.

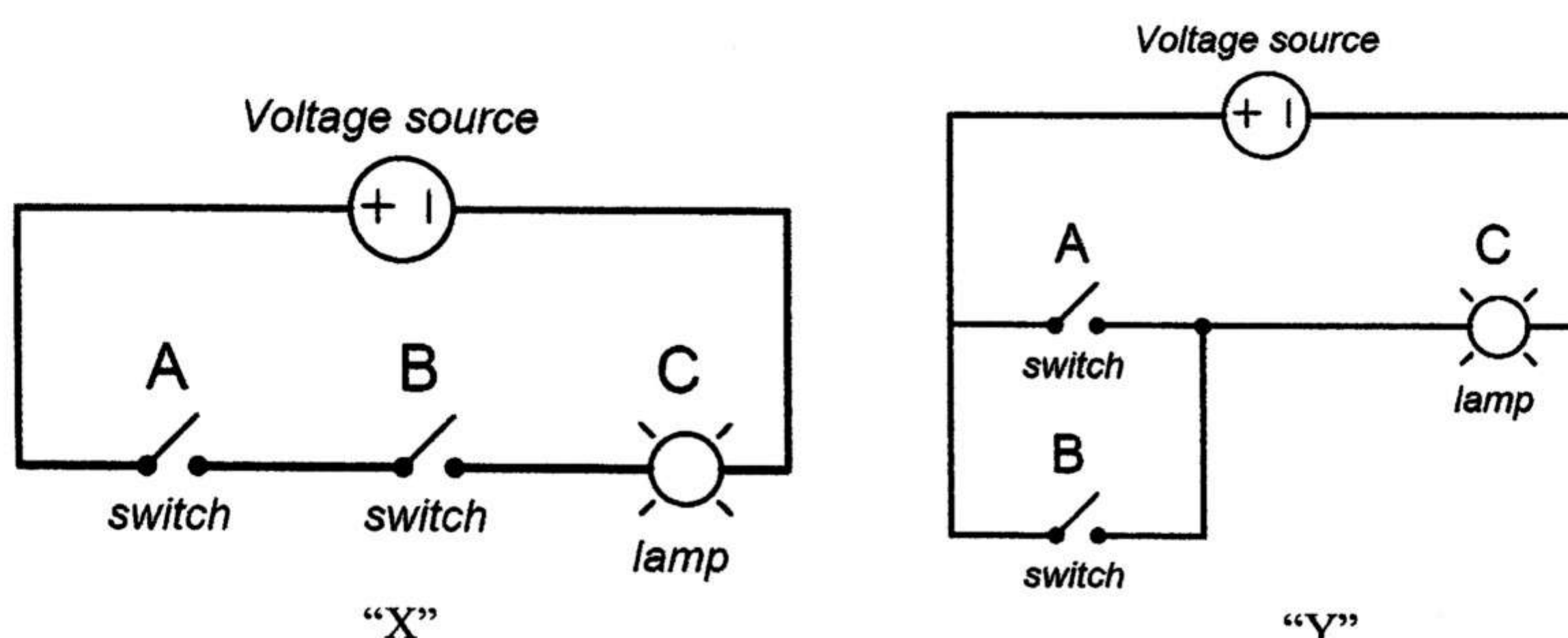
2. a) Prove the universality of the NOR gate. 2
 b) Explain the ASCII, EBCDIC, and BCD coding systems in detail including at least one application for each. 3

3. a) Complete the truth table according to the logic circuit stated below: 2



A	B	C	Q
0	0		
0	1		
1	0		
1	1		

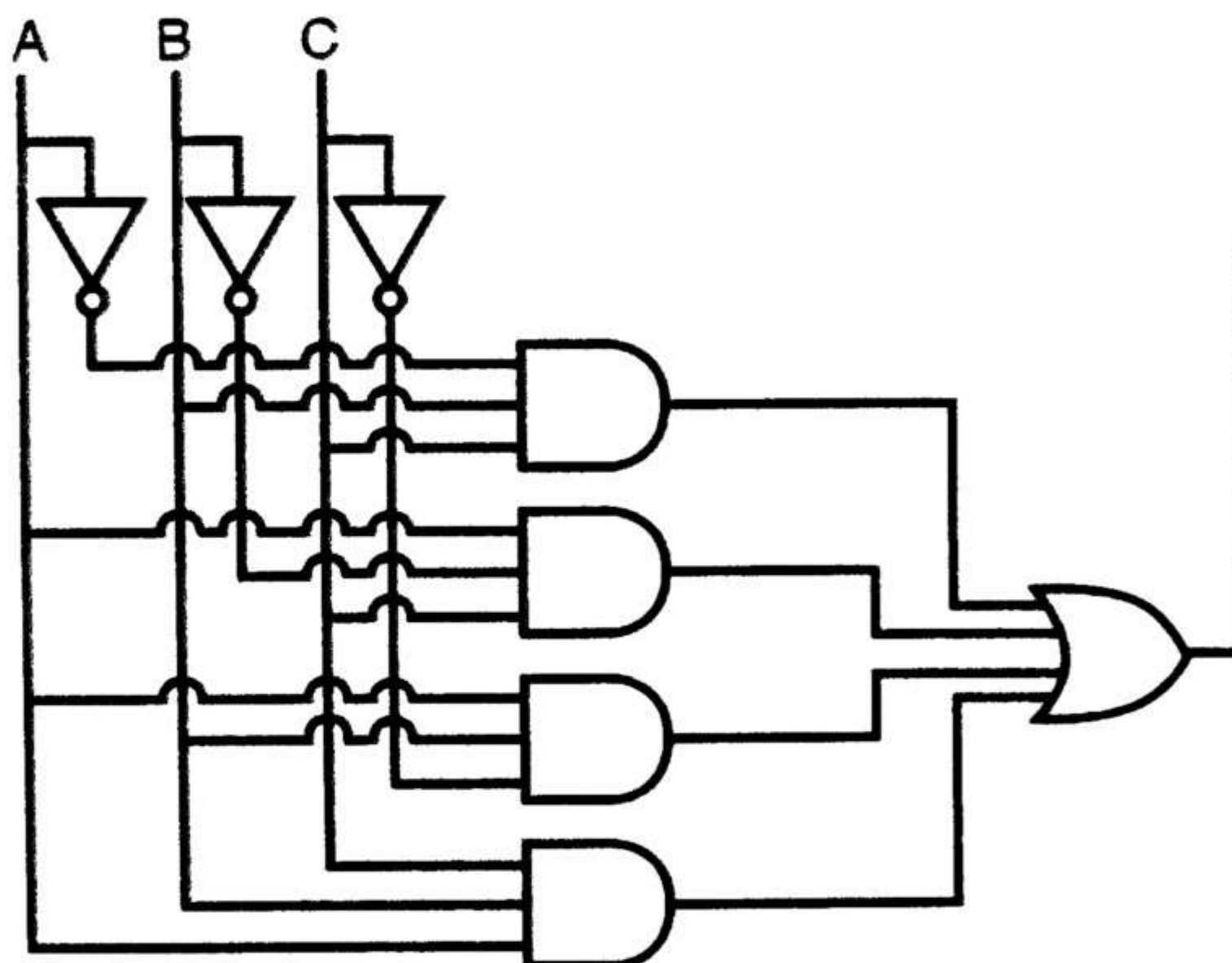
- b) Define the following “X” and “Y” logic gates. How could you illuminate the lights at both gates? Provide an illustration of the gate setup along with proper justification. 3



4. a) What is 2’s complement number system? Add $(0100)_2$ and $(-0111)_2$ using 2’s complement system. 2
 b) What is the degree of a relationship in a Database Management System (DBMS)? Describe the various relationship cardinalities, illustrating each with an appropriate example. 3
5. a) What are the functions of an operating system (OS)? Write three different types of OS for a desktop PC. 2
 b) Simplify the following Boolean expression: 3
 i. $\overline{(A + B + C)} = \overline{B} \cdot \overline{C}$ ii. $XYZ + \overline{X}YZ + XY\overline{Z}$ iii. $\overline{(AB)} \overline{(A + B)}$

SECTION-B

6. Why does a program lost when there is a power failure if it has not been saved? 2
7. a) What is a computer network? Compare LAN, MAN, and WAN. 2
b) What is e-commerce? Write about the benefits and drawbacks of e-commerce. 3
8. a) What is data abstraction in a Database Management System (DBMS)? Describe the different levels of abstraction in a DBMS. 2
b) Proof that 3
i. $F \cdot \bar{F} = 0$ ii. $F + \bar{F} = 1$; if $F = \bar{X}Y + XYZ$
9. a) What is Number system? Briefly describe the types of number system with examples. 2
b) Covert the following number system 3
i. $(450.625)_{10} = (?)_8$, ii. $(10101.11)_2 = (?)_8$, iii. $(525.27)_8 = (?)_{16}$
10. a) Find out the output of the logic circuit with truth table 3



- b) How could you differentiate RAM and SSD? Explain with proper justification. 2

Chattogram Veterinary and Animal Sciences University
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Bachelor of Science (Honours) in Biotechnology and Genetic Engineering
1st Year 1st Semester Final Examination-2025
Course Title: Fundamental of Biochemistry (Theory)
Course Code: 0512-FOB-101 (T)

Full Marks: 70

Time: 3 Hours

[Figures in the right margin indicate full marks. Answer any **3 (three)** questions from each section, where question No. **1 (one)** and **5 (five)** are compulsory. Use separate answer script for each section. Split answers are strongly discouraged.]

SECTION-A

1. a) Define biochemistry. Describe the scope of biochemistry in reference to molecular basis of life. 1+2=3
- b) What is biomolecule? Mention the building block and major functions of the following biomolecules: (i) Polysaccharide (ii) Protein (iii) Lipid (iv) DNA and (v) RNA 1+5=6
- c) Explain the connection of biochemistry in related to biology, medicine and agriculture, giving one example for each. 2
2. a) Define the following terms with examples: (i) Disaccharide (ii) Aldose sugar (iii) Ketose sugar and (iv) Asymmetric carbon. 1×4=4
- b) Explain why β-D glucose is a reducing sugar. 3
- c) Distinguish the structure of starch and glycogen in brief. 5
3. a) Describe four important physical and chemical properties of water that support biochemical reactions. 4
- b) Explain the structure of water molecule briefly. 4
- c) What do you mean by hydrogen bond? Show the hydrogen bond between the water molecules. 2+2=4
4. a) Define amino acids. Classify them based on polarity and nutritional requirement with examples. 1+2=3
- b) Explain the peptide bond formation and the significance of N-terminal and C-terminal residues. 1+2=3
- c) What is isoelectric pH? Draw the structure of the following peptide: "E-C-G". 1+2=3
- d) Describe the biological importance of protein in living organism. 3

SECTION-B

5. a) Define and classify nucleic acid. Draw the general structure of purine and pyrimidine. Distinguish between nucleoside and nucleotide. 2+1+2=5
- b) What is Chargaff's Rule? Draw and label the Watson and Crick's model of DNA. 2+2=4
- c) Define any **2 (two)** of the following terms: (i) Denaturation (ii) Annealing and (iii) T_m 1×2=2
6. a) Define and classify proteins with examples. 1+3=4
- b) Write down the structure of proteins. Enumerate the bonds associated with protein structure. Distinguish between α-helix and β-pleated sheet. 1+1+2=4
- c) Briefly describe the physical and chemical properties of proteins. 2+2=4
7. a) Define lipids and classify them with examples. 2+2=4
- b) Write down the general characteristics and biological functions of lipids. 2+2=4
- c) Define essential fatty acids (FA). Illustrate the structure of the following FA: (i) Linoleic acid (ii) Arachidonic acid and (iii) Stearic acid. 1+3=4
8. a) Write short notes **on any 4 (four)** of the following: (i) Vitamin (ii) Hormone (iii) Heteropolysacchride (iv) Steroid and (v) Rancidity 4×3=12

Chattogram Veterinary and Animal Sciences University
Faculty of Biotechnology and Genetic Engineering
Bachelor of Science (honours) in Biotechnology and Genetic Engineering
1st Year 1st Semester Final Examination-2025
Course Title: Basic Biology (Theory)
Course Code: 0511-BIO-101 (T)

Full Marks: 70

Time: 3 Hours

[Figures in the right margin indicate full marks. Answer any **3 (three)** questions from each section, where question No. **1(one)** and **5 (five)** are compulsory. Use separate answer script for each section. Split answers are strongly discouraged.]

SECTION-A

1. a) Enlist the principal characteristics of living things. 2
b) Enumerate the most important events that happened after the Big Bang. 2
c) Draw a schematic diagram of the timeline of the universe evolution. 3
d) What are the levels of biological organization? Provide an example from each level in relation to application of biotechnology and genetic engineering. 1+3=4
2. a) Differentiate between mitosis and meiosis cell division. 2
b) Differentiate between passive and active transport mechanisms with suitable examples. 3
c) Explain the fluid mosaic model of cell membrane structure with appropriate labelling. 3
d) Describe the stages of mitosis in sequence. Explain one major event that occurs in each stage. 4
3. a) Define taxon, taxonomy and systematics. 3
b) Give an outline of five kingdom classification. 5
c) Who is the father of binomial nomenclature? 1
d) Provide two diagnostic features of bacteria, gymnosperms and angiosperms with an example of each group. 3
4. a) Define biodiversity. Describe different levels of ecosystems. 1+2=3
b) Give an overview of the floral and faunal biodiversity of Bangladesh. 4
c) Write a brief note on extinct species of Bangladesh. What are the main factors behind their extinction? 2+3=5

SECTION-B

5. a) Draw the process of moon formation. 2
b) Discuss how life originates from non-living matter. 2
c) Describe the early structure of the earth. Explain how it transformed from a homogeneous mass to a differentiated planet. 1+2=3
d) What are the theories of the origin of life? Describe Panspermia, Deep-Sea Hydrothermal Vent Hypothesis and RNA World Hypothesis. 4
6. a) Distinguish between extinct and endangered species. 2
b) What are the biodiversity hotspots of Bangladesh? 4
c) What is cell cycle? Describe the phases of the eukaryotic cell cycle. 3
d) Explain the structure and functions of the nucleus, mitochondria and rough endoplasmic reticulum. 3
7. a) Discuss the criteria of five kingdom classification. 3
b) Categorize the following organisms into their respective phyla mentioning the diagnostic features and economic importance and comment on their contribution to animal kingdom: Earthworm and Mouse. 4
c) Differentiate between bacteria and protozoa. 2
d) Describe the evolutionary transition from aquatic to terrestrial habits in plants. What adaptations facilitated this transition? 2+1=3
8. Write short notes any **three (03)** of the followings: (i) Algae (ii) Bryophytes (iii) Pteridophytes. (iv) Ciliophora. 3×4=12

Chattogram Veterinary and Animal Sciences University
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Bachelor of Science (Honours) in Biotechnology and Genetic Engineering
1st Year 1st Semester Final Examination-2025
Course Title: Physics (Theory); Course Code: 0533-BPV-101 (T)
Bio-Physics

Full Marks: 35

Time: 2 Hours

[Figures in the right margin indicate full marks. Answer any 4 (Four) 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) Write the physical significance of capillary in our daily life. 1.0
b) Show the surface tension of a liquid is equal to the mechanical part of its surface energy. 2.0
2. a) State and explain Coulomb's law for electrostatics. 2.0
b) State and explain Kirchhoff's current and voltage laws. 3.0
3. a) State and explain first law of thermodynamics. 1.0
b) Show that the efficiency of a Carnot cycle depends on the temperature of the source and the sink. 4.0
4. a) Explain the formation mechanism of "Depletion region" in a pn junction diode. How does the depletion region behave under forward and reverse biasing condition? 4.0
b) Draw the energy-based diagram for n-type and p-type semiconductor material. 1.0
5. a) Define electric dipole moment. Calculate the electric field strength at a point along the perpendicular bisector of an electric dipole. 3.0
b) A positive charge of $q_1 = 3 \times 10^{-7} \text{ C}$ is placed at a distance of 0.5 m from another positive charge of $q_2 = 6 \times 10^{-7} \text{ C}$. At what point on the joining line the electric field strength will be zero? 2.0

SECTION-B

6. a) Show that for a liquid in stream line motion $\frac{P}{\rho} + gh + \frac{v^2}{2} = \text{Constant}$, where the symbols have their usual meaning. 2.0
7. a) Derive the photo-electric equation $h\nu = h\nu_0 + \frac{1}{2}mv^2$, where the symbols have their usual meaning. 2.0
b) Establish a relationship between half life and decay constant for radioactive element. The half life of a radioactive substance is 30 days. (i) Calculate decay constant. (ii) Calculate time taken for 3/4 of the original number of atoms to disintegrate. 3.0
8. a) Define Bohr's atomic model along with its limitation. 1.0
b) State Faraday's and Lenz's law of electromagnetic induction. Show that electromagnetic induction is a consequence of principle of conservation of energy. 2.0
9. a) Derive an expression for the surface tension of a liquid inside a capillary tube according to capillary rise method. 2.5
b) Draw the electric symbol of a npn transistor and explain its working principle. 1.5
c) "A p-n junction diode can work as half wave rectifier"- explain. 1.0
10. a) State Ohm's law and define resistance. 2.0
b) Explain the principle and application of MRI in medical diagnosis. 3.0

Chattogram Veterinary and Animal Sciences University
Faculty of Biotechnology and Genetic Engineering
Bachelor of Science (Honors) in Biotechnology and Genetic Engineering
1st Year 1st Semester Final Examination-2025
Course Title: ^{Introductory} Elementary Animal Science (Theory)
Course Code: 0811-EAS-101 (T)

Full Marks: 35

IAS

Time: 2 Hours

[Figures in the right margin indicate full marks. Answer any 3 (three) questions from each section, where question No. 1 (one) and 5 (five) are compulsory. Use separate answer script for each section. Split answers are strongly discouraged.]

SECTION-A

1. a) What is animal science? Briefly describe the scope of animal science in relation to biotechnology and genetic engineering applications. 1+2=3
b) Define any 2 (two) of the following terms: (i) Biotechnology (ii) Genetic Engineering (iii) Anatomy 1×2=2
2. a) Classify the animal kingdom with examples. 1
b) What is system? Enumerate the systems of human body. Draw and label the female reproductive system of *Bos taurus*. 1+1+1=3
c) Compare the digestive system of human, ruminant and chicken. 2
3. Draw and label the external morphology, economic importance and biotechnological significance of any 2 (two) of the followings: (i) *Macrobrachium rosenbergii* (ii) *Gallus domesticus* (iii) *Labeo rohita* 3×2=6
4. a) What do you mean by laboratory animals? Mention the external morphology and the organs of different systems of laboratory animals. 1+2=3
b) State the economic importance and biotechnological significance of laboratory animals. 3

SECTION-B

5. a) What are rodents? Enumerate the biological data of *Rattus norvegicus* and *Mus musculus*. 1+2=3
b) Zebra fish is a model organism to study the metabolic disorder of higher animal"-Justify the statement. 3
6. a) What is cell? Classify different types of prokaryotic cells. 1+1=2
b) Compare and contrast between the animal and plant cells. 2
c) Draw and label the circulatory system of *Homo sapiens*. 2
7. a) Define apiculture and sericulture. Describe in brief about the products, marketing and financial aspects of apiculture and sericulture. 1+2=3
b) Describe the commercial aspects of poultry and dairy farming. 3
8. Write short notes on any 3 (three) of the following: (i) Major microbes (ii) Mollusca, (iii) Parasites (iv) Communicable disease 3×2=6

Chattogram Veterinary and Animal Sciences University
Faculty of Biotechnology and Genetic Engineering
Bachelor of Science (Honours) in Biotechnology and Genetic Engineering
1st Year 1st Semester Final Examination-2025
Course Title: General Chemistry (Theory)
Course Code: 0531-CHE-101 (T)

Full Marks: 70

Time: 3 Hours

[Figures in the right margin indicate full marks. Answer any **3 (three)** questions from each section, where question No. **1 (one)** and **5 (five)** are compulsory. Use separate answer script for each section. Split answers are strongly discouraged.]

SECTION-A

1. a) What is pH? State the Lowry-Bronsted theory and Lewis theory of acids and bases. 1+2=3
 b) What are conjugate acid-base pairs? Give two examples. 1+1=2
 c) What is acid rain? Determine the pH of 0.1 M NaOH solution. 1+2=3
 d) Do you expect the pH of pure water at 100 °C to be less than 7, or more than 7? Explain your answer. 3
2. a) Briefly explain the buffer solution. Give an example of acid buffer and basic buffer. 2+1=3
 b) Define indicator. How can you choose an indicator for a given titration? 1+4=5
 c) Derive Henderson's equation to calculate the pH of a buffer solution. 2
 d) At 25 °C, the dissociation constant (K_a) of acetic acid is 1.8×10^{-5} . Calculate the pH of a solution containing 0.18 g mol of acetic acid and 3.01 g mol of sodium acetate per litre. 2
3. a) Define chemical equilibrium and explain that it is dynamic. 4
 b) Describe the characteristics of chemical equilibrium. 4
 c) Illustrate the principle of Le Chatelier's. $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g) + 22.0$ Kcal equilibrium. 4
4. a) Define oxidation-reduction reactions in biochemical terms. Give an example of each from cellular metabolism. 2+2=4
 b) Why are oxidation-reduction reactions important for production? 4
 c) What is co-ordinate covalent bond? Explain with two examples. 2+2=4

SECTION-B

5. a) Explain the electronic theory of valence. 2
 b) What type of bond is present in Al_2O_3 ? Why? Explain. 3
 c) Differentiate between the polar and non-polar covalent bond. 2
 d) Define hybridization and explain the hybridization of C_1H_4 . 1+3=4
6. a) What is pi bond? Explain the formation of pi bond in ethylene. 1+2=3
 b) Define thermodynamics, system, boundary, and surroundings. 4
 c) State the first law of thermodynamics with mathematical expression. 3
 d) Calculate the ΔE , q and w if 3 moles hydrogen at 3 atm pressure expand isothermally at 50°C and reversibly to a pressure of 1 atm. 2
7. a) Briefly explain valence and valence electron with examples. 2
 b) What is hydrogen bond and how sulphur formed H-bond and H atom? 2+2=4
 c) Discuss the ionic bond and intra-molecular forces. Explain the bond formed in $MgCl_2$ with figure. 2+4=6
8. a) What is spontaneous process? Give some examples. Write down the criteria for spontaneity. 2+1+2=5
 b) Briefly define the entropy and state the 2nd law of thermodynamics. 2+2=4
 c) Define isomer. Explain the criteria of optical isomer. 1+2=3

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Course Title: Elementary Animal Science (Theory)
Course Code: 0811-EAS-101 (T)

Full Marks: 70

Time: 3 Hours

[Figures in the right margin indicate full marks. Answer any **3 (three)** questions from each section, where question No. **1 (one)** and **5 (five)** are compulsory. Use separate answer script for each section. Split answers are strongly discouraged.]

SECTION-A

1. a) What do you know about animal science? Briefly describe the scope of animal science in relation to biotechnology and genetic engineering applications. 1+2=3
- b) Who proposed 5 Kingdom classification of living organism? Briefly describe the 5 major phylum of animal kingdom. 1+3=4
- c) Enlist the major characteristics of arthropods. Draw and label the morphology of *Macrobrachium rosenbergii*. 2+2=4
2. a) Define any two of the following terms: (i) Biotechnology (ii) Genetic Engineering (iii) Anatomy (iv) Digestion 1×4=4
- b) What is system? Enumerate the systems of human body. Draw and label the anatomy of female reproductive system of *Bos taurus*. 1+1+2=4
- c) What do you mean by circulatory system? Draw and label the different parts of heart with specific function. 1+3=4
3. a) Draw and label the external morphology, economic importance and biotechnological significance of the *Gallus domesticus* 4
- b) Define Apiculture. What are the advantages and disadvantages of *Bombyx mori* cultivation? 1+3=4
- c) Define the following terms: (i) Hydrophytes (ii) Mesophytes (iii) Xerophytes and (iv) Halophytes 1×4=4
4. a) What do you mean by laboratory animal? Justify the animal uses in biomedical medical research and classify laboratory animals with examples. 1+3=4
- b) Describe the housing, feeding; handling, experimental procedure, and bio-medical applications of mouse. 4
- c) Define fresh water ecosystem with figure. 4

SECTION-B

5. a) What are rodents? Distinguish between the biological data of *Rattus norvegicus* and *Mus musculus* 1+3=4
- b) Distinguish the between the following pair: (i) SPF and GF (ii) Flora and Fauna 2×2=4
- c) What is the functional unit of life? Distinguish between plant and animal cell. 1+2=3
6. a) What do you mean by communicable disease? Distinguish between following organism: (i) Bacteria and Virus (ii) Protozoa and Parasites 1+6=7
- b) What is pathogen? What are the precautions will you take to prevent communicable diseases like hepatitis and tuberculosis? 1+4=5
7. a) Provide a scenario of technical, commercial and functional aspects of sericulture. 4
- b) What is poultry? Briefly describe the housing, feeding and management pattern of broiler production. 1+3=4
- c) Define non-communicable disease with examples. Describe briefly a non-communicable disease. 2+2=4