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 མུ་ཏིག་ཐང་འབྲིང་རིམ་སློབ་གྲྭ་གོང་མ།



**MOTITHANG HIGHER SECONDARY SCHOOL
 THIMPHU THROMDE**

“Every child is **inspired** to learn and **empowered** with **wisdom** to excel in life”
ANNUAL EXAMINATION 2018

Subject: Biology (Theory)
 Class :XI

Writing Time: 3hours
 Maximum Marks:100

NAME:..... Class /sec..... Roll no.....

Invigilator’s initial

Section	Section A					Section B						
Question	Question 1											
	A	B	C	D	E	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Marks	15	5	5	5	10	10	10	10	10	10	10	10
Marks Awarded												
Total marks Awarded												
Teacher’s Signature												

READ THE FOLLOWING INSTRUTCIONS CAREFULLY

1. The first fifteen minutes of the examination time is for reading the paper only. Candidates must **NOT** start writing during this time.
2. Answer all the questions in section A and any six questions from section B.
3. The intended marks for questions are given in brackets [].
4. Answer all the question in the answer sheet provided.

SECTION A (40 Marks)
(All questions are compulsory)

Question 1

A. Read the following questions carefully. For each question there are four alternatives. Choose the correct alternatives and write it in answer sheet. [15]

- i. ABO system of blood grouping in human is an example of
 - Incomplete dominance
 - Blending inheritance
 - Co dominance
 - Complete dominance

- ii. Lactose is a disaccharide and it is composed of
 - Fructose and galactose
 - Glucose and fructose
 - Glucose and glucose
 - Glucose and galactose

- iii. All of the following are GM crops EXCEPT
 - Humulin
 - Bt cotton
 - New leaf
 - Flavr Savr

- iv. During inspiration in human the volume of thoracic cavity increases due to
 - Relaxation of radial and inter costal muscles
 - Contraction of radial inter costal muscles
 - Contraction of radial and relaxation of inter costal muscles
 - Relaxation of radial and contraction of inter costal muscles.

- v. Minimata disease in human is caused by pollution of drinking water. Metal found in such type of polluted water is
 - Cadmium
 - Mercury
 - Nitrate
 - Arsenic

- vi. During anaphase of mitosis, chromosomes
 - Undergo coiling
 - Move towards the equator
 - Line up at the equator
 - Break and move toward opposite poles

- vii. Niche is best defined as the
 - Position of species in a community in relation to other species
 - Place where organism lives
 - Place where organism lives and perform its duty
 - Place where population lives and performs their duties.

- viii. Function of Pons varoli is to
 - Transmit impulses from one cerebrum to another.
 - Transmit impulses from one cerebellum to another.
 - Maintain equilibrium.
 - Link nervous and endocrine system.

- ix. When body gets over heated, all of the following happens EXCEPT
- Sweating
 - Pilo erection
 - Hair dropped
 - Vasodilation
- x. Which factor is responsible for inhibition of enzymatic process during feedback?
- End product
 - Enzymes
 - pH
 - Temperature
- xi. Eustachian valve is present at the opening of
- Superior vena cava in left auricle
 - Superior vena cava in right auricle
 - Opening of inferior vena cava
 - Opening of coronary sinus
- xii. In sweet potato, vegetative propagation is carried out by underground
- Corm
 - Bulb
 - Stem
 - Roots
- xiii. *Mangifera indica* is the scientific name of mango. Scientific name consist of
- Genus and phylum
 - Class and order
 - Genus and species
 - Species and family
- xiv. In a Mendelian monohybrid cross, which generation is always completely homozygous?
- F₁ generation
 - F₂ generation
 - F₃ generation
 - P generation
- xv. Each restriction endonuclease enzyme cleaves a molecule o at
- Methyl group
 - End of genes
 - Time of DNA replication
 - A particular nucleotide sequence

B. Complete the following sentences

[5]

- i. The hormone.....is secreted by posterior pituitary at the end of pregnancy for easy birth of a child.
- ii. Enzyme.....helps in the synthesis of complementary DNA strands on a DNA template during cloning of gene.
- iii.is a special form of predation in which predator and prey belong to same species.
- iv. In a protein molecule, amino acids are joined together by..... bonds.
- v. The various forms of a gene is called.....

C. Match the items of column A with items of column B. Rewrite the correct matching pair.

[5]

Column A	Column B
i. Eosinophil	a. Cross between heterozygous F ₁ hybrid.
ii. Hyperthyroidism	b. Controls emotional behaviour
iii. Bronchial asthma	c. Gull's disease
iv. Neutrophils	d. Cross involving reverse sexes
v. Limbic system	e. Grave's disease
vi. Hypothyroidism	f. Relay centre for sensory impulses
vii. Emphysema	g. Engulf bacteria
viii. Test cross	h. Caused by allergens or stress
ix. Diencephalon	i. Promotes tissue inflammations
x. Reciprocal cross	j. Caused by pollutants or smoke.

D. Correct the following statements.

[5]

- i. Phospholipids have both hydrophilic and hydrophobic layers, making it an amphoteric in nature.
- ii. Enzymes having slightly different molecular structure but performing identical activity are coenzymes.
- iii. Rod cells are photo receptor cells containing the photosensitive pigments called iodopsin.
- iv. Hyposecretion from adrenal cortex produces the symptoms such as bronze like pigmentation on skin, restlessness is called Conn's disease.
- v. Total number of genes present in the haploid set of chromosomes is called genotype.

E. Short answer type.

[10]

- i. Why are enzymes referred to as 'biocatalyst'?
- ii. What is the difference between external and internal respiration?
- iii. A true breeding tall plant is crossed with a true breeding dwarf plant. F₁ progeny is 100% tall. Explain why F₁ shows only one type of parental phenotype.
- iv. List down the significance of lymphatic system.
- v. Explain positive feedback mechanism with one example.
- vi. What happens when insulin level goes down?
- vii. If pituitary gland of an individual is surgically removed. Which endocrine glands will be affected?
- viii. Explain reflex arc in a spinal reflex action.
- ix. What is the difference between reproductive and non-reproductive cloning?
- x. How does biomagnifications take place?

PART B (60 marks)

Answer any **six** questions.

Question 2

- i. Describe in brief the factors which affect enzymatic action. [2]
- ii. Explain the phenomenon of competitive inhibition of enzymatic action with the help of a diagram. [2]
- iii. Draw a neuron and label the following parts [2]
 - a. Nissl's granules
 - b. Myelin sheath
 - c. Synaptic knob
 - d. Schwann cell
 - e. Node of ranvier
 - f. Dendrite
- iv. Do you think it is ethical to manipulate organisms for human benefit? Justify your answer. [2]
- v. High light any four areas where genetically modified organisms are used. [2]

Question 3

- i. Describe and mention the functions of three types of RNAs. [3]
- ii. Differentiate between [2]
 - a. Food chain and food web
 - b. Sympathetic and parasympathetic nervous system.
- iii. List down the functions of cerebrospinal fluid. [2]
- iv. Define the following terms [3]
 - a. Population density
 - b. Ecosystem
 - c. Eutrophication

Question 4

- i. What is Haldane effect? [1]
- ii. Describe how CO₂ is taken up from the tissue and transported to the lungs. [3]

- iii. What is plant tissue culture? Describe the technique of tissue culture. [4]
- iv. Draw neat pyramids for the following [2]
 - a. Stable population
 - b. Diminishing population

Question 5

- i. During summer when we sweat heavily, what effect would this have on osmotic pressure of blood and how the level of ADH will change? [2]
- ii. Explain how homeostasis is maintained by any two organ system in human. [2]
- iii. Write a short note on the following [4]
 - a. Phases of Cell cycle
 - b. Asexual reproduction in animals
- iv. In your opinion which kind of pollution is most harmful? Give reasons to support your answer. [2]

Question 6

- i. Define cardiac cycle. Enumerate the events during a cardiac cycle. [4]
- ii. *Mirabilis jalapa* shows in complete dominance for flower colour. Work out the progeny for the cross between plants with pink flowers and state their phenotypic and genotypic ratio.[3]
- iii. What is cytokinesis? [1]
- iv. Define the following terms [2]
 - a. Detritivore
 - b. Species

Question 7

- i. Classify the polysaccharide based on its function. Give example each. [3]
- ii. write down the function of the following [3]
 - a. area centralis
 - b. vitreous humour
 - c. aqueous humour
- iii. Why are the restriction endo nucleases referred to as restriction enzyme? [1]
- iv. What is PCR? List down the steps involved in PCR. [2]
- v. Explain with help of a diagram the pyramid of number. [1]

Question 8

- i. Mention the function of the following. [4]

a.Pheromones	c.sphygmomanometer
b.Electrocardiograph	d.Adrenaline
- ii. Describe the morphology of a chromosome as seen during metaphase stage. [3]
- iii. Draw and label a plant cell in telo phase stage of mitosis [1]
- iv. List down four characteristics of kingdom protista [2]

Goodluck