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མུ་ཏིག་ཐང་འབྲིང་རིམ་སློབ་གྲྭ་ཐོང་མ།



MOTITHANG HIGHER SECONDARY SCHOOL  
THIMPHU THROMDE

“Every child is inspired to learn and be empowered with wisdom to excel in life”

TRIAL EXAMINATION- 2019

Science Paper 3 (Biology).  
Class: X

Full mark: [100]  
Time: [2.15]

Name: \_\_\_\_\_ Class/Section: \_\_\_\_\_ RollNo: \_\_\_\_\_

Invigilator's Initial

For Teachers use only													
Question Number	Section A						Section B						Total (100)
	Question I						Qn 2	Qn 3	Qn4	Qn 5	Qn 6	Qn 7	
	A	B	C	D	E	F							
Marks	25	5	6	4	5	5	10	10	10	10	10	10	
Total Marks Awarded													
Teacher's Initial													

Read the following directions carefully.

1. Do not write for the first 15 minutes. This time is to be spent reading over the questions. After having read over the questions the time given at the top of this paper is the time allowed for writing the answers.
2. On the space provided above, write your name, class and roll number.
3. In this paper there are two sections – A and B. Section A is **compulsory** and you are expected to attempt **any five questions** from Section B.
4. The intended marks for questions or parts of the questions are given in the bracket.
5. Read the directions to each questions carefully and write all your answers neatly in the space provided in the question booklet itself.

**SECTION A (50 Marks)**  
**Compulsory: Attempt ALL questions**

**Question 1**

**A Directions: Each question in this part is followed by four possible choices of answers. Choose and circle the correct answer in the question booklet. [25 MARKS]**

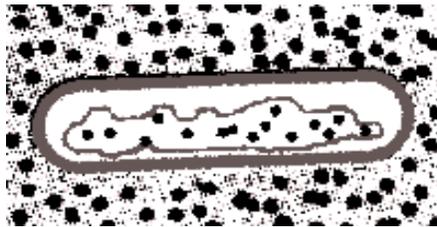
1 The cell which have 'true nucleus' is said to be

- A. eukaryotes.
- B. prokaryotes.
- C. bacteria.
- D. unicellular.

2 In an onion root tip, the correct sequence of mitotic division is

- A. Interphase – prophase – metaphase – telophase – anaphase.
- B. Interphase – prophase – metaphase – anaphase – telophase.
- C. Interphase – prophase – anaphase – metaphase - telophase.
- D. Interphase – prophase – telophase – metaphase – anaphase.

3 The diagram below shows a stage of cell when placed in certain type of solution. The cell cytoplasm shrinks and cell membrane is pulled away from the cell wall. The solution in which the cell was placed is



- A. pure water.
- B. hypotonic solution.
- C. hypertonic solution.
- D. isotonic solution.

4 Salting of meat and pickles is a method of preserving food by the process of

- A. osmosis.
- B. turgidity.
- C. plasmolysis.
- D. Deplasmolysis.

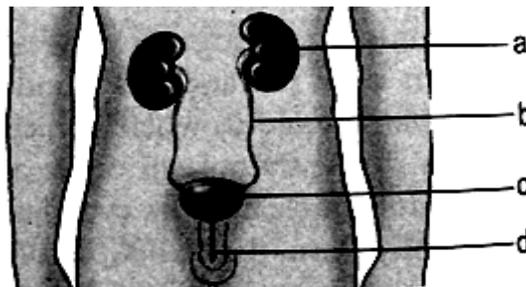
5 The chlorophyll in leaf becomes activated by absorbing light energy and the absorbed light is used to split water molecule into hydrogen and oxygen ions. This reaction of photosynthesis occurs in

- A. stoma.
- B. grana.
- C. stroma.
- D. cytoplasm.

6 Organic food materials are transported through plant stems in

- A. vascular bundles.
- B. the xylem.
- C. phloem.
- D. sieve cell.

- 7 Which one of the following is the gaseous plant hormone?  
**A.** auxin. **C.** gibberellin.  
**B.** ethylene. **D.** abscisic acid.
- 8 The factor which does not affect the rate of photosynthesis is  
**A.** temperature. **C.** velocity of wind.  
**B.** light intensity. **D.** carbon dioxide concentration
- 9 Which of the following is NOT correctly matched with regard to the organ and its function?  
**A.** Mouth – starch digestion.  
**B.** Stomach – protein digestion.  
**C.** Large intestine – bile production.  
**D.** Small intestine – absorption of food.
- 10 The type of WBCs that defend our body by the process of phagocytosis is  
**A.** basophils. **C.** neutrophils.  
**B.** eosinophils. **D.** lymphocytes.
- 11 The given diagram given below shows the human urinary system. The parts marked a, b, c and d are



- A.** a- kidney, b-urethra, c-urinary bladder, d-ureter.  
**B.** a- kidney, b- urinary bladder, c-sphincter, d-urethra.  
**C.** a- kidney, b-ureter, c-urinary bladder, d-urethra.  
**D.** a-kidney, b-urinary bladder, c-urethra, d-collecting duct
- 12 The part of nephron in the kidney, where ultrafiltration of blood occurs is the  
**A.** Bowman's capsule. **C.** distal convoluted tubule.  
**B.** proximal convoluted tubule. **D.** collecting duct
- 13 During vigorous activity under low oxygen condition, the lactic acid is formed in the body. This condition leads to the  
**A.** shut down of glycolysis.  
**B.** muscle soreness and fatigue.  
**C.** production of more carbon dioxide.  
**D.** production of more adenosine triphosphate.





iii. An enzyme secreted by salivary gland that helps in the digestion of starch.

Ans: .....

iv. A complex polysaccharide that made up the cell wall in fungi.

Ans: .....

v. The killed or weakened germ or germ substance introduced into the body to develop immunity.

Ans: .....

**C State whether the following statements are TRUE or FALSE. Correct the false statements. [6 MARKS]**

i. Water potential of pure water is greater than that of 10% sugar solution.

Ans: \_\_\_\_\_

ii. The acid present in the stomach is the potassium chloride.

Ans: \_\_\_\_\_

iii. Heparin is a chemical substance in the blood which initiates the process of clotting.

Ans: \_\_\_\_\_

iv. Viruses are known as endoparasites.

Ans: \_\_\_\_\_

v. Genes are the hereditary units.

Ans: \_\_\_\_\_

vi. The receptor is the muscle/gland that responds to nerve impulse.

Ans: \_\_\_\_\_

**D Differentiate between the following. (Any one point of difference). [4 Marks]**

**i. Diffusion and osmosis**

Diffusion	Osmosis

**ii.** Light reaction and dark reaction.

Light reaction	Dark reaction

**iii.** Sympathetic nervous system and parasympathetic nervous system.

Sympathetic nervous system	Parasympathetic nervous system

**iv.** Gram positive bacteria and gram negative bacteria.

Gram positive bacteria	Gram negative bacteria

**E Choose the correct words from the brackets and fill in the blanks [5 Marks]**

- (i) An animal cell kept in \_\_\_\_\_ solution will burst after sometime.  
[Hypertonic, hypotonic, isotonic]
- (ii) During the process of photosynthesis \_\_\_\_\_ is oxidized.  
[Water, oxygen, carbon dioxide]
- (iii) A gene which cannot express its character in presence of contrasting character is called \_\_\_\_\_ gene.  
[ Dominate, Recessive, homozygous]
- (iv) Antibodies are produced on exposure to \_\_\_\_\_.  
[Disease, antibiotic, antigens]
- (v) The process of prevention of pregnancy is called. \_\_\_\_\_  
[contraception, fertilization, infertility]

**F Match each item under column A with the most appropriate item in column B. Rewrite the correct matching pairs in the space provided. [5 Marks]**

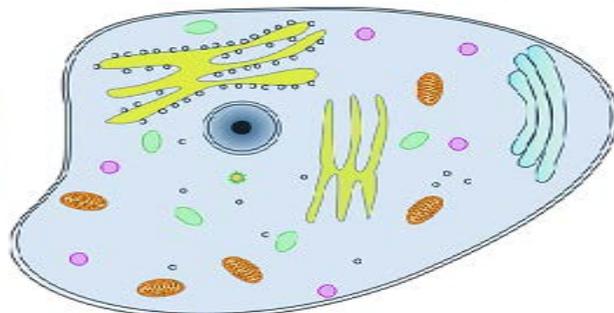
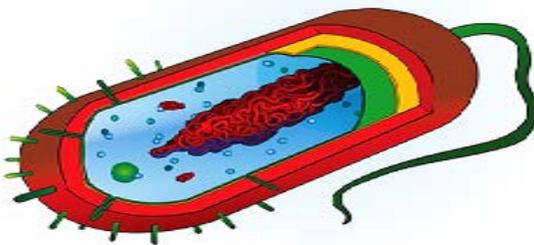
Question	Answer	Choose from the answer column and write here
(i) Progesterone	carries impulses from the central nervous system to effector.	
(ii) In-vitro fertilization	carries sensory signals from the receptors to the nerve centers in the central nervous system.	
(iii) Motor neuron	maintains glucose level in the blood.	
(iv) Sensory neuron	Help absorb glucose from small intestine.	
(v) Insulin	fertilization occurs outside the body and culture of embryo inside.	
	thickens the wall of uterus.	

**SECTION B (50 Marks)**  
**Attempt any FIVE questions**

**Question 2**

**A**

- i. Identify the type of cell for cell A and cell B. Support with one reason in each case. [2 marks]



Ans:

ii. Write two visible structural differences between cell A and cell B? [2 marks]

Cell A	Cell B

iii. How is cell A structurally similar to plant cell? [1 mark]

Ans

**B**

i. Define the following terms. [2 marks]

a. Active transport

Ans:

b. Mineral Nutrition

Ans:

ii. Write one reason how lactic acid fermentation differ from alcoholic fermentation. [1 marks]

Lactic acid fermentation	Alcoholic fermentation

iii. Write two differences between red blood cells and white blood cells in the table given below. (Any two points of difference). [2 marks]

Red blood cells	White blood cells

### Question 3

A

i. Draw a neat diagram of cell as it would appear in metaphase of mitosis of cell division in animal and label the following parts: [4 marks]

- a. centriole
- b. spindle fibre
- c. chromosomes
- d. centromere

ii. Explain Blackman's law of limiting factors of photosynthesis. [2 marks]

Ans

**B**

- i. List down two uses of Auxin and Gibberellins in plants. [2 marks]

Ans:

- ii. "Ileum is a part of small intestine where complete digestion of food takes place". Explain the adaptation of ileum for the efficient absorption of food. [2 marks]

Ans:

**Question 4****A**

- i. Draw a neat diagram of a nerve cell and label the following parts. [3 marks]

a. dendrites                      b. axon                      c. medullary sheath      d. cyton

- ii. Identify and categorize the following actions into natural reflex and conditioned reflex and write it in the column given below. [3 marks]

**(1. Grasping reflex in babies,              2.Quick closing of eyelids in strong light, looking      3.Salivation at the sight of favourite dish      4.Knitting without      5. Dog runs away when it sees a person bending down.      6.Knee jerk as result of sharp,)**

Natural reflex	Conditioned reflex

**B**

i. Give reasons or suitable explanations for the following: [2 marks]

a. Active immunity is better than passive immunity

Ans:

b. Human red blood cells are circular and biconcave in shape.

Ans:

ii. Write down two symptoms of a diabetes mellitus. [2 marks]

Ans:

**Question 5**

A A heterozygous tall pea plant (Tt) is crossed with another heterozygous tall pea plant (Tt).

a. Draw the Punnett square for the above mentioned pea plant. [1 mark]

Ans:

- b. What are the types of off springs (genotype and phenotype) produced in the above cross? [2 marks]

Ans:

- c. Find out the proportion (ratio) of genotypes of phenotypes in the off springs [2 marks]

Ans:

**B**

- i. Explain the economic importance of bacteria in the following: [2 marks]

a. Agriculture: (one importance)

b. Industry: (one importance)

- ii. Expand the following abbreviations. [3 marks]

a. ATP:

b. BCG:

c. OPV:

## Question 6

**A**

**i.** Complete the following table.

[2 marks]

Disease	Pathogens	Mode of transmission
Tuberculosis	1 _____	Contact with nasal discharge, and sputum of patient
2. _____	Fungus	Physical contact, through contact with clothing.
3. _____	Clostridium tetani	Direct entry of pathogens
Syphilis	Treponema pallidum	4 _____ _____

**ii.** Write two difference between Asexual and Sexual reproduction

[2 Marks]

	Asexual reproduction	Sexual reproduction
1		
2		

**B** Suggest and explain three ways to prevent from being infected with sexually transmitted infections (STI's).

[3 marks]

Ans:

C The following paragraph is related to some of the most fundamental processes which have significance in the life of all organism. Fill in the blanks by selecting the appropriate word from the given brackets. [ 3 Marks ]

[ Transpired, Phloem, Hypertonic, Diffusion, Xylem, Absorbed, Hypotonic, Osmosis, Ascent ]

Water is .....(i) by root hair from the soil. This is because the solution in the soil is .....(ii) whereas the cell-sap in the root hair cell is .....(iii). The continued inward movement of the water happens through the cell to cell.....(iv) which helps in the .....(v) of the cell-sap upward through the .....(vi) of the stem.

### Question 7

A Define . [5 marks]

i. Vaccination

Ans:

ii. Mutation

Ans:

iii. Recombination

Ans:

iv. Hybridization

Ans:

v. Hematocrit

Ans:

**B** Identify the odd in set and name the category to which the three remaining belong. [3 marks]

Set	Odd	Category
Phenol, Lime, Iodine, Formalin		
Cell wall, Plastids, Large vacuole, Centrosome		
Renal Artery, ureter, loop of Henle, renal vein,		

**C** Write two differences between Glycolysis and Krebs's cycle. [2 Marks ]

Glycolysis	Krebs's cycle