



नेपाल शिक्षा मन्त्रालय
सुदूरपश्चिम प्रदेश शिक्षा विभाग



**MOTITHANG HIGHER SECONDARY SCHOOL
THIMPHU THROMDE**

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

TRIAL EXAMINATION 2020

Class:10
Biology.

Writing time: 2 Hours
Total marks: 100

Name:.....Roll no.....Class.....Section.....

Invigilator'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.

For Teachers use only													
	Section A (50)					Section B (50)							
Question Number	Question 1					Qn2	Qn3	Qn4	Qn5	Qn6	Qn7	Qn8	Total
	a	b	c	d	e								
Marks	25	5	5	5	10	10	10	10	10	10	10	10	
Total Marks Awarded													
Teacher's Initial													

Section A (50 Marks)

Compulsory: Attempt all questions.

Question no. 1

a. Each question in this section is provided with four possible options. **Choose the most appropriate option and circle with pen on the selected option number. [1X25=25]**

1. Under low oxygen conditions, production of lactic acid in the body can lead to
 - a. The shut down of glycolysis
 - b. Muscle soreness and fatigue
 - c. The production of more carbondioxide
 - d. The production of more ATP

2. A person has blood group O^{-ve}. The statement means that,
 - a. The person lacks the Rh factor in his blood
 - b. The person has the Rh factor in his blood
 - c. The person has Rh antibodies in his blood plasma
 - d. The person can receive blood from O^{+ve}

3. Which statement given below is correct for photosynthesis?
 - a. Photosynthesis occurs in three phases: light dependent phase, light independent phase and dark phase
 - b. Light dependent reaction is also known as Calvin cycle
 - c. Photosystem is of two types: photosystem I and photosystem II
 - d. Photolysis is the breakdown of water to release carbondioxide

4. According to this theory, the ions absorbed on the surface of the root cells and clay particles are not held tightly but oscillate within the small volume of space called oscillation volume. This theory is
 - a. Contact exchange theory
 - b. Carbonic acid exchange theory
 - c. Mass flow
 - d. Donnan equilibrium

5. If karma dorji is able to type without looking at his keyboards, this is an example of
 - a. Simple reflex
 - b. Conditioned reflex
 - c. Mixed reflex
 - d. Natural reflex

6. Which of the following organs is paired with its incorrect function?
 - a. Stomach – protein digestion
 - b. Oral cavity – starch digestion
 - c. Large intestine –bile production
 - d. Small intestine – nutrient absorption

7. A partial Punnet square is shown below.

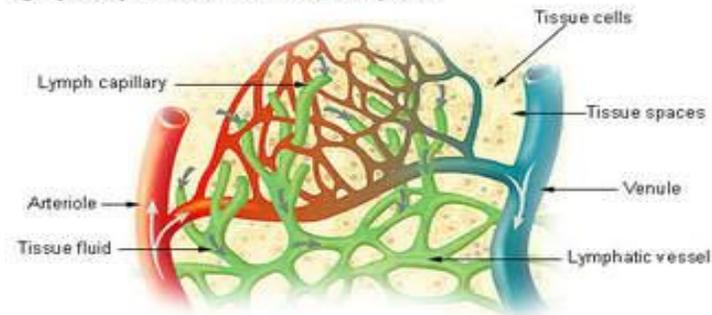
TT	TT
Tt	Tt

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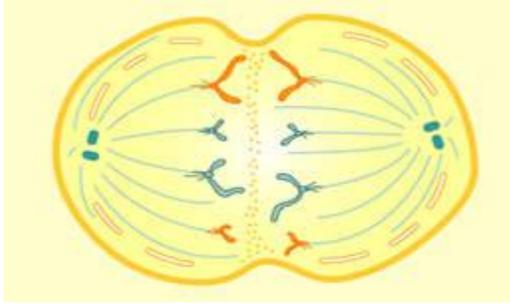
Which of the following statements describe the parental genotypes that would result in this Punnett square?

- a. Both parents are heterozygous
 - b. Both parents are homozygous dominant
 - c. One parent is homozygous dominant and the other parent is heterozygous
 - d. One parent is homozygous recessive and the other parent is heterozygous
8. The figure given below explains the mechanism of exchange of substances between the capillaries and the tissues. The pressure which helps in the exchange of materials is known as,

Lymph Capillaries in the Tissue Spaces



- a. Tissue pressure
 - b. Cellular pressure
 - c. Turgor pressure
 - d. Hydrostatic blood pressure
9. Which of the following enzymes is paired with its incorrect function?
- a. Maltase – maltose digestion
 - b. Lactase – lactose digestion
 - c. Erepsin – protein digestion
 - d. Lipase – glucose digestion
10. The receptors present in the retina of the eyes to detect light stimulus are the
- a. Chemoreceptors
 - b. Photoreceptors
 - c. mechanoreceptors
 - d. thermoreceptors
11. When a cell is immersed into a hypertonic solution, water flows out of the cell in order to balance the concentration of the solutes. This process of movement of water out of the cell is called
- a. Exosmosis
 - b. Osmosis
 - c. Plasmolysis
 - d. Endosmosis
12. A segment of DNA has one strand with the following sequence of bases:
AGCGCATAGCAA
The complimentary strand of DNA would be
- a. UCGCGUAUCGUU
 - b. TCGCGTATCGTT
 - c. GAUAUGCGAUGG
 - d. AGCGCATAGCAA
13. The cell given below depicts a certain phase of mitosis. The depicted phase is



- a. Metaphase
- b. Anaphase
- c. Prophase
- d. Telophase

14. Suppose you are walking along when you see a football coming at high speed towards your head. You would probably move or duck quickly to avoid the contact. A summary of the sequence of events is

- a. Stimulus → receptor → coordination → effector → response
- b. Stimulus → effector → coordination → receptor → response
- c. Response → receptor → coordination → effector → stimulus
- d. Response → effector → coordination → receptor → stimulus

15. Which of the following statement is not the cause for infertility in human.

- a. Women are not able to produce enough follicle stimulating hormone
- b. Males produce low sperm count
- c. The formation of egg in female can be irregular
- d. Thyroid drugs are not produced in sufficient amount

16. The figure given below is a type of white blood cell having three lobed nucleus and granules which gives purple colour when stained with leishman's stain. The given cell is

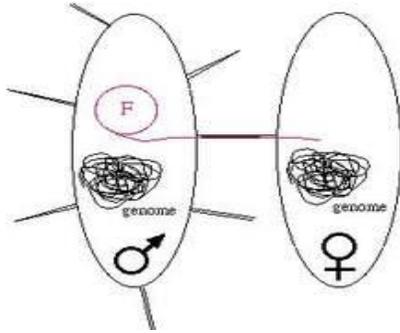


- a. basophils
- b. eosinophils
- c. neutrophils
- d. lymphocytes

17. Sangay Wangmo has a severe uterine bleeding issue and is in need of a hormonal therapy which will help to maintain the lining in the uterus that resembles the lining produced during pregnancy. If you were a doctor which of the hormonal therapy would you recommend for her

- a. I-pill
- b. Ortho-evra
- c. medroxyprogesteron
- d. levothyroxine

18. The given figure below shows the transfer of 'F' factor between two bacterial cells. This kind of transfer is possible through



- a. Conjugation
 b. Binary fission
 c. Binary fusion
 d. Asexual reproduction

19. A fungal disease in human which shows the following symptoms: red itchy patches on the head, body and in between fingers and toes, is
 a. Tinea b. Scabies c. Ringworm d. Athlete's foot
20. According to the immunization schedule for Bhutan, the vaccine given to a baby at birth is
 a. BCG b. MMR c. DTP d. MMR
21. Dawa has a good harvest of citrus fruits this year. But he needs time to carry out negotiations on the market value of his fruits with his marketing incharge. As such he wants to delay the ripening of his citrus fruits. If you were Dawa's friend which plant hormone would you recommend to delay the ripening of his fruits?
 a. NAA b. IAA c. ethylene gas d. Gibberellin
22. The ring experiment in which the ring of bark is removed including the phloem from the stem of the plant is
 a. Evidence for the translocation of food in plants
 b. Evidence for transportation of water in plants
 c. Evidence for food storage in plants
 d. Evidence for photosynthesis in plants
23. The germ or germ substance administered into the body to make a person resistant to infectious diseases is a
 a. antibiotics b. antibodies c. vaccine d. antitoxins
24. In the normal karyotype of sangay wangmo, the 23rd pair of sex chromosomes will be
 a. XY b. XX c. YY d. XXY
25. Brown eye (B) is dominant over blue eyes (b). The _____ combination of alleles signifies heterozygous dominant condition.
 a. BB b. bb c. Bb d. none of the above

- b. **Match each item under Column A with the most appropriate item in Column B. Rewrite the correct matching pairs in the space provided. [5]**

Column A	Column B
Tuberculosis	Bordetella pertussis
Syphilis	Salmonella typhi
Whooping cough	Xanthomonas citri
Typhoid	Mycobacterium tuberculosis
Citrus canker	Treponema pallidum

Ans:

Column A	Column B
Tuberculosis	
Syphilis	
Whooping cough	
Typhoid	
Citrus canker	

- c. **Fill in the blanks. [1x5=5]**

1. Accumulation of excess fluids in a body causes swelling of the body and the condition is called
2. Some virus also have outer lipid layer covering around the capsid called the
3. The white blood cells destroy and digest virus and bacteria by engulfing them in a process known as.....
4. The human body regularly sheds and replaces its skin cells. The process that is directly responsible for replacing these cells is
5. A nutrient in the food which is too large to pass through the blood vessel but absorbed through the lacteals is.....

- d. **State whether the following statements are true or false and correct the false statement. [1x5= 5]**

1. Active immunity develops when antibodies are obtained from other living organisms.
2. The rod shaped bacteria are called coccus.
3. When a graph shows both continuous and discontinuous variation then it is called bipolar graph.
4. If you apply scent, your friends will be able to smell it because of diffusion.

5. Phosphorylation is the process of making ATP during photosynthesis.

e. Answer the following questions. [10]

i. Read and complete the table below. [1X4 =4]

Types of mutation	Characteristic features	Types of cells affected
1.....	It disappears with the death of the animal	Soma/ body cells
Germ cell mutation	2.....	germ/gametic/sex cells
3.....	Point mutation which occurs in the locus of genes	All types
4.....	Macromutation which occurs in the chromosome	All types

ii. Virus possess both the characteristics of living and non-living. Justify with reasons. [1]

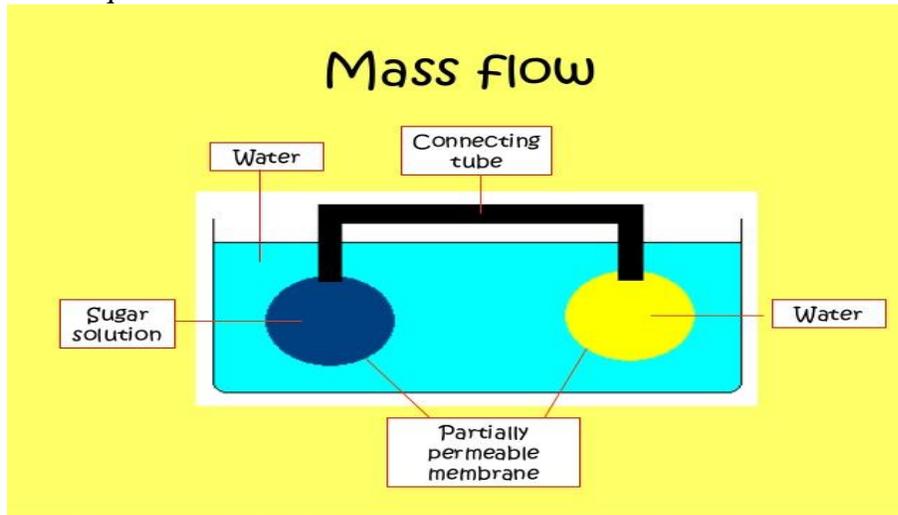
iii. Explain the importance of contraceptions and family planning . [2]

iv. Why did Mendel select the pea plant to carry out his experiments in test crosses? Give three reasons. [3]

Section B (50 marks)
Attempt only FIVE Questions

Question no. 2.

- a. A student set up experiment in the laboratory as shown below. Study and answer the questions that follow:

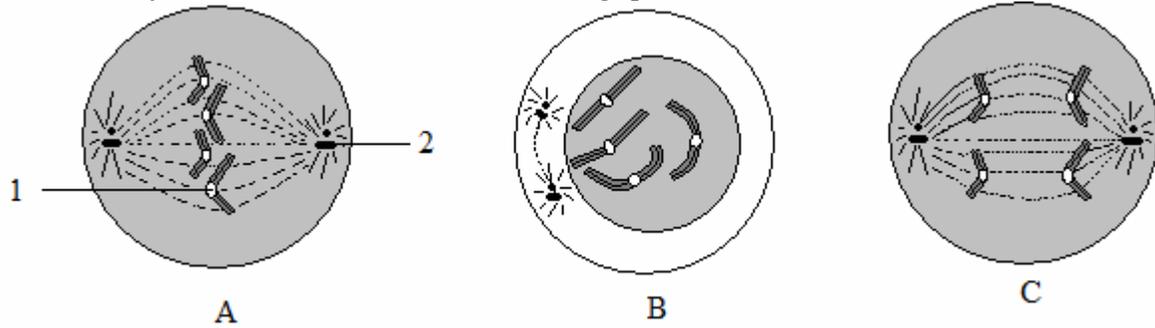


1. What is the aim of the experiment? [1]

 2. What does the parts A, B, C and D represent in the plants? [0.5x4=2]

 3. Explain the terms “source” and “sink” in relation to above mechanism. [1]
- b. Explain one drawback for the above mentioned hypothesis. [1]

c. The diagrams given represent certain phases of mitotic division but wrongly sequenced, study the same and answer the following question.



1. Write the correct sequence of the above stages by using the letters A, B and C. [1]

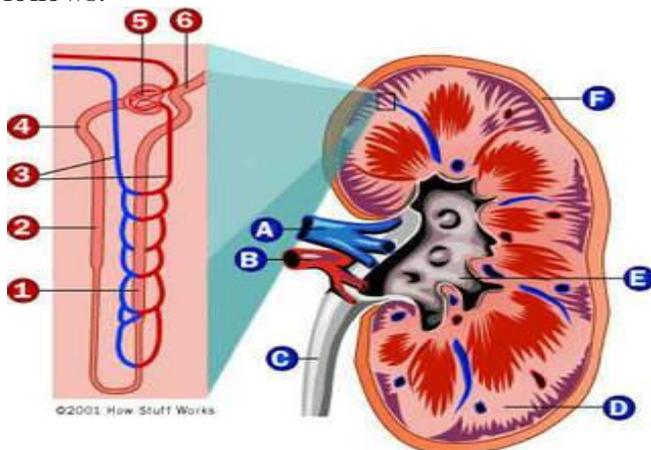
2. Name the **two** phases of mitosis shown in the diagram above. [1]

3. Name the parts labelled 1 and 2. [1]

4. Write down **two** significance of mitotic division. [2]

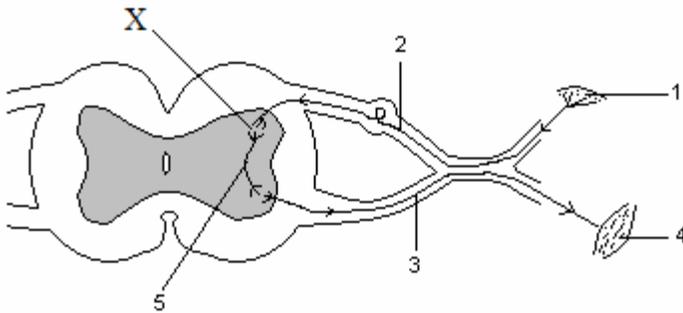
Question no. 3.

Study the figure given below which is a small part of the kidney and answer the questions that follows.



Question no. 4.

- a. The diagram given below shows the internal structure of the spinal cord showing a pathway for a simple reflex. Study the same and answer the questions that follow.



1. Label the parts numbered 1 to 5. [2.5]

2. What is the term used for the point X shown in the diagram? [0.5]

3. Explain the term X in the above diagram? [1]

4. What are neurotransmitters? [0.5]

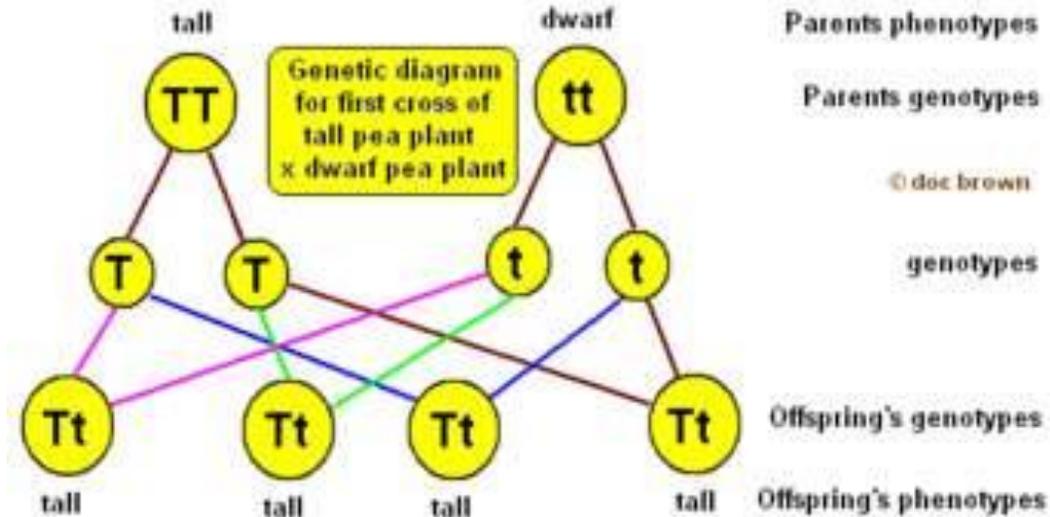
5. Explain the functions of - *sensory neuron, relay neuron and motor neuron.* [1.5]

6. Give two examples of conditioned reflexes. [1]

7. Sonam Dorji come across a snake when going to school one day and he runs away from the spot as fast as possible. Based on the above statement draw a reflex arc for the sequence of events above and name the receptors and effectors. [3]

Question 5.

- a. Study the genetic cross given below and answer the questions that follows.



- Write down the genotype and phenotype for the offsprings. [1]
- Work out the possibility of the genotypes and phenotypes in the F₂ generation, if the offsprings from above were self pollinated, and grown again. [1.5+1]

- Which phenotype is dominant in the above case? [0.5]

- b. A white flowered plant is crossed with a pink flowered plant. All of the F₁ offsprings from the cross are white. Based on this statement answer the following questions.

- Which phenotype is dominant in the above case? [1]

2. What are the genotypes of the original parent plants? [1]

3. Work out the possibility of the genotype and phenotype in the F₂ generation if one of the white F₁ plants is crossed with a true breeding pink flowered plant. [1.5]

4. One of Mendel's law states that the inheritance of one trait will not affect the inheritance of another. Which law of Mendel best explains this statement? [1]

5. Give one example each for the following terms. [1.5]
 - a. Heterozygous alleles-

 - b. Codominance-

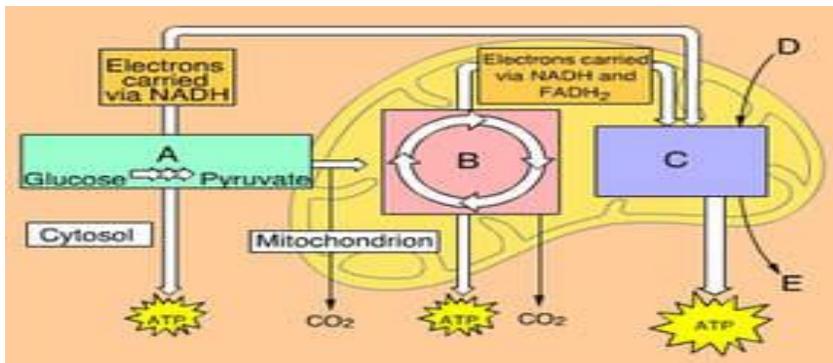
 - c. Mutagen-

Question no. 6.

- a. Classify the following diseases under the headings 'infectious' and 'non-infectious'. [3]
Anemia, appendicitis, AIDS, coronary heart diseases, whooping cough, rickets, tuberculosis, measles, diabetes, syphilis, influenza, haemophilia.

<i>Infectious</i>	<i>noninfectious</i>

b. The steps in aerobic respiration can be represented as shown below. Study and answer the questions that follow.



1. Identify steps A, B and C in the above figure. [1.5]

2. Within a cell , where does the glycolysis stage of aerobic respiration occur? [1]

3. What is the difference between the anaerobic respiration of plants and animals? [1]

4. After a vigorous exercise we feel very tired. Explain giving reasons. [1]

5. Write down three differences between aerobic and anaerobic respiration. [1.5]

6. What is ultrafiltration? [1]

Question 7.

a. Draw a fruiting structure of fungi and label the following parts: [2.5+1]

1. Stolon, 2. Sporangiphore 3. Sporangium 4. Rhizoids 5, Septate hyphae

b. Write the purpose of each of the following: [2.5]

1. TAB-

2. BCG-

3. Salk's vaccine -

4. MMR -

5. DTP-

c. Define the following terms: [4]

1. Mutation

2. Cytokinesis

3. Chiasmata

4. Autosomes

Question no. 8

a. Give reasons for the following questions. [1X5=5]

1. Generally, only the male child suffers from colour blindness and not the female.

2. A red blood cell will burst open when put in distilled water.

3. Live attenuated vaccines are better compared to inactivated vaccines.

4. Its important to check expiry date before buying any canned or packed food.

5. Mostly bacterial cells are used for recombination in genetic engineering.

b. Write down one difference between the following pairs based on what is given in brackets. [1X5=10]

1. Prokaryotes and Eukaryotes (Nucleus)

Prokaryotes	Eukaryotes

2. Mitosis and Meiosis (number of daughter cells produced)

Mitosis	Meiosis

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3. Type 1 diabetes and Type 2 diabetes (body's ability to produce insulin)

Type 1 diabetes	Type 2 diabetes

4. Natural reflex and Conditioned reflex (Examples)

Natural reflex	Conditioned reflex

5. Lysozyme and Zymogen (Site of production)

Lysozyme	Zymogen