

BOARD OF SECONDARY EDUCATION (TELANGANA)
SUMMATIVE ASSESSMENT – II
TENTH CLASS BIOLOGICAL SCIENCE MODEL PAPER
PAPER – II (ENGLISH VERSION)

Time: 2 Hours 45 Minutes

PART A & B

Max. Marks: 40

INSTRUCTIONS:

- i) In the time duration of 2 hours 45 minutes, 15 minutes of time is allotted to read and understand the question paper.
- ii) Answer the questions under PART – A on a separate answer book.
- iii) Write the answers to the questions under PART – B on the question paper itself and attach it to the answer book of PART – A.

Time: 2 hrs.

PART – A

Marks: 35

INSTRUCTIONS:

- i) PART – A comprises of three Sections I, II and III.
- ii) All the questions are compulsory.
- iii) There is no overall choice. However there is internal choice to the questions under Section – III.

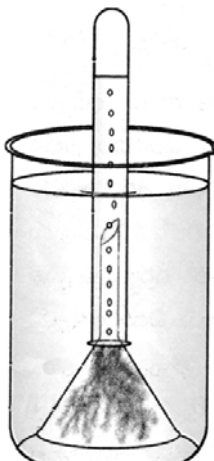
SECTION – I

Note: i) Answer ALL the questions.

- ii) Each question carries ONE mark.
- iii) Write answers in 1 – 2 sentences for each question.

7 × 1 = 7

1. What is mean by excretion?
2. How do you think bacteria dividing to form curd?
3. What is the uses of platelets?
4. Most leaves have the upper surface more green and shiny than the lower ones. Why?
5. Do you think it is necessary to have a lot of lighting for decoration during celebration?
6. What is Heridity?



7.

What will you prove by this experiment?

SECTION – II

Note: i) Answer ALL the questions.

ii) Each question carries TWO marks.

iii) Answer the questions in 4 – 5 sentences.

6 × 2 = 12

8. State two similarities between aerobic and anaerobic respiration?
9. What happens to plant if the rate of respiration becomes more than the rate of photosynthesis?
10. Draw a brief diagram showing from water absorption by roots to transpiration by leaf?
11. Imagine what happens if waste materials are not sent out of the body from time to time?
12. Nature selects only desirable characters. Prepare a cartoon.
13. What precautions will you take to keep away from various sexually transmitted diseases?

SECTION – III

Note: i) Answer ALL the questions.

ii) Each question carries FOUR marks.

iii) There is internal choice for each question. Only one option from each question is to be attempted.

iv) Answer each question in 8 – 10 sentences.

4 × 4 = 16

14. Describe the structure of nephron with the help of diagram?

(OR)

Make a flow chart to show the cell cycle and explain cell division describing different stages of mitosis?

15. What are the different modes of a sexual reproduction? Cite them with examples.

(OR)

Explain monohybrid experiment with an example. Which law of inheritance can we understand? Explain.

16. What experiment do you prefer to understand action of saliva on flour? Explain its procedure and apparatus that you followed.

(OR)

What procedure do you follow to understand the effect of plant growth hormones (in agar median) in the terminal portion of the tip of stem (coleoptile)?

17. Prepare a cartoon on Pavlov's experiment with suitable caption!

(OR)

Proper utilisation of natural resources is the way to show gratitude to our nation. Can you support this statement. Give your argument.

INSTRUCTIONS:

i) Answer ALL the questions.

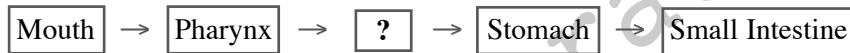
ii) Each question carries $\frac{1}{2}$ mark.

iii) Answers are to be written in question paper only.

iv) Marks will not be awarded in any case of overwriting, rewriting or erased answers.

v) Write the CAPITAL LETTER (A, B, C, D) showing the correct answer for the following questions in the brackets provided against them. $10 \times \frac{1}{2} = 5$

1. Write missing part from following flow chart. ()



- A) Bucal Cavity B) Large Intestine C) Oesophagus D) Rectum

2. Each ATP molecule gives how many calories of energy ()

- A) 7400 cal B) 7200 cal C) 7600 cal D) 7500 cal

3. Which of the following opinion is correct? ()

- A) Ravi said – Xylem and phloem cell arranged one upon the other to form a tube like structure.
 B) John said – Xylem and phloem are not separate tube like structure.
 C) Salma said – Xylem and phloem cells connect together to form a tube like structure.
 D) Hari said – Because of its shape they said to be tube like structures.

4. Which of the following is the correct path taken by urine in our body? ()

- A) kidney – uterus – bladder – urethra bladder
 B) kidney – uterus – bladder – urethra
 C) kidney – bladder – urethra – ureters
 D) kidney – bladder – ureters – urethra

5. Diabetes is related to this gland ()

- A) Thyroid B) Pancreas C) Adrenal D) Pituitary

6. Match the following. ()

- 1) Fragmentation () a) Planaria
 2) Parthenogenesis () b) Yeast
 3) Budding () c) Spirogyra
 4) Regeneration () d) Watermelon

A) 1-c, 2-d, 3-b, 4-a B) 1-c, 2-d, 3-a, 4-b

C) 1-d, 2-c, 3-b, 4-a D) 1-a, 2-b, 3-d, 4-c

7.



This diagram indicates us

()

- A) Tongue – Food chewing
- B) Stomach – digest the food
- C) Villi – absorb the digestive juice
- D) None of these

8.

The four characters observed in the experiments on law of independent assortment are

()

- A) Round and yellow
- B) Wrinkled and green
- C) Wrinkled and yellow
- D) A and B only

9.

The pH of Saliva is

()

- A) Acidic
- B) Basic
- C) Neutral
- D) None of these

10.

Sustainable development means

()

- A) Prevention of wastage
- B) Stable growth
- C) Development without damaging
- D) High yieldings in less time

ANSWERS

SECTION - I

1. What is mean by excretion?

A: Due to metabolism several harmful excretory products are formed, the process of removing toxic waste from the body is called excretion.

2. How do you think bacteria dividing to form curd?

A: Curdling indicates that the increase in number of bacteria by fission.

3. What is the uses of platelets?

A: ♦ Blood platelets play an important role in blood clotting.
♦ When the blood vessel is injured, the platelets collect at the site of the injury and form a plug.

4. Most leaves have the upper surface more green and shiny than the lower ones. Why?

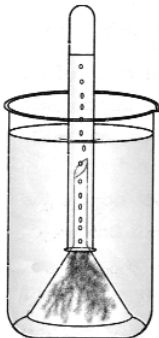
A: The upper surface is more green and shiny than the lower ones because the upper surface comprising of the palisade parenchyma has more number of chloroplasts than the spongy parenchyma in the lower surface.

5. Do you think it is necessary to have a lot of lighting for decoration during celebration?

A: ♦ No. It is not necessary to have a lot of lighting to decorate an occasion of celebration.
♦ It consumes more electricity.

6. What is heridity?

A. The process of acquiring characters or traits from parents is called 'Heredity'.



7.

What will you prove by this experiment?

A: By this experiment we will going to prove oxygen is released during photosynthesis.

SECTION - II

8. State two similarities between aerobic and anaerobic respiration?

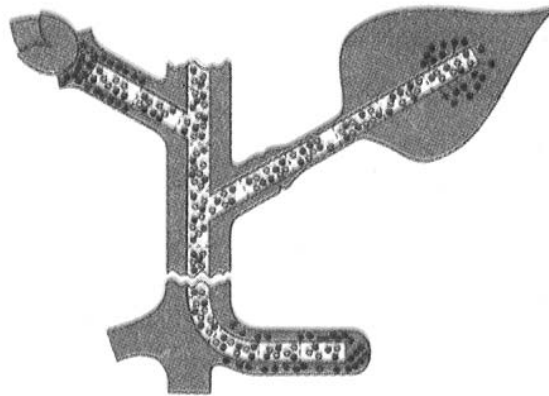
A: ♦ Both aerobic and anaerobic respiration release energy by breaking down glucose molecule.
♦ The energy produced by these two processes will be used to carryout various functions of the body.
♦ Both aerobic and anaerobic respirations take place in a cell.

9. What happens to plant if the rate of respiration becomes more than the rate of photosynthesis?

A: ♦ Respiration is a catabolic process and photosynthesis is an anabolic process.
♦ In catabolic process bigger molecules are broken down into smaller molecules like the glucose molecule into water and carbon dioxide as in respiration.
♦ In anabolic process like photosynthesis simple molecules like CO₂ and water are converted into complex carbohydrate molecules.
♦ If respiration over takes photosynthesis in a plant, it is starved off from the supply of food and there by it gets etiolated and finally it leads to death of the plant.

10. Draw a brief diagram showing from water absorption by roots to transpiration by leaf.

A:



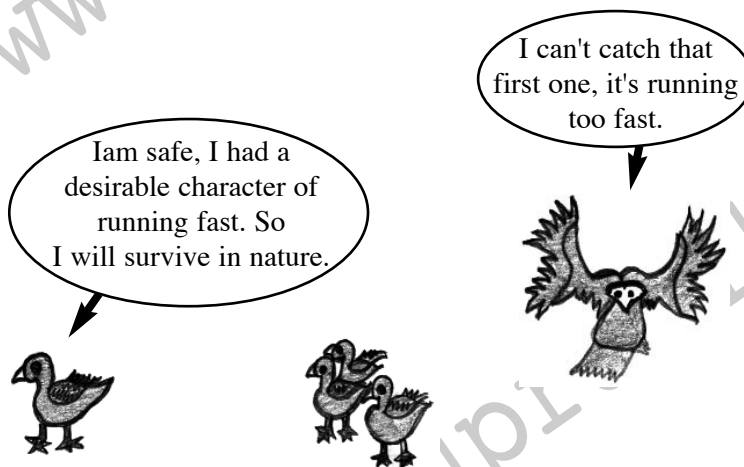
Transportation

11. Imagine what happens of waste materials are not sent out of the body from time to time?

- A:
- ◆ They get accumulated in the body.
 - ◆ The accumulation of toxic wastes in the body harms an organism.
 - ◆ If all the waste released is not sent out, the waste gets stagnated, produce toxins and poisons which pollute the body. They lead to death of the organism.

12. Nature selects only desirable characters. Prepare a cartoon.

A: "Nature selects only desirable characters".



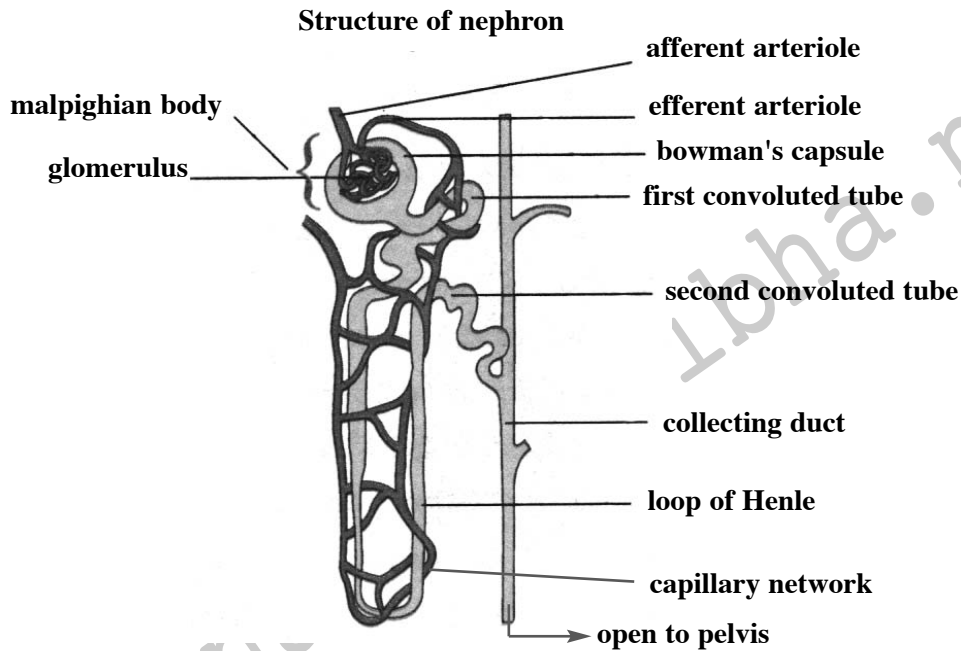
13. What precautions will you take to keep away from various sexually transmitted diseases?

- A: Precautions to be taken to keep away from various sexually transmitted diseases
- ◆ Avoid sex with any one who has genital sores, a rash, discharge or other symptoms.
 - ◆ I will follow abstinence, be careful and correct life style, which is known as ABC for being healthy.
 - ◆ I wash genital organ before and after intercourse.
 - ◆ I will get a vaccination for hepatitis – B.
 - ◆ Sexual act is supposed to be an act between husband and wife.

SECTION – III

14. Describe the structure of nephron with the help of diagram.

A:

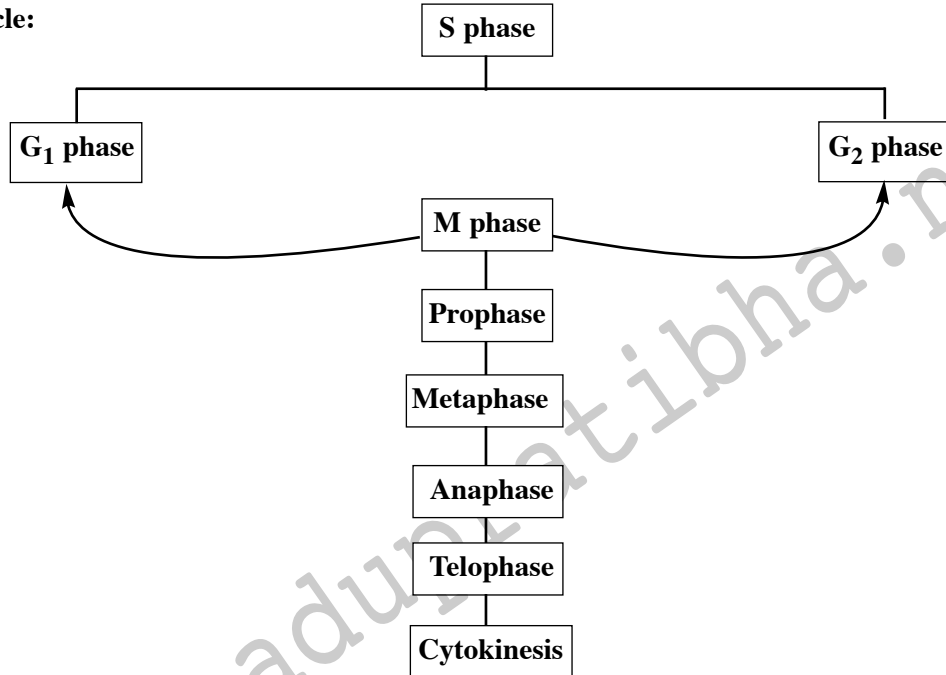


- ◆ Nephron is a specialised tubular structure made up of proximal convoluted tubule, a "U" shaped tube called loop of Henle, and distal convoluted tubule.
- ◆ The three tubular components are selectively permeable and only allow specific molecules to pass through them.
- ◆ The nephron is surrounded by capillaries called peritubular capillaries that arise from the efferent arterioles.
- ◆ The substances essential for the body are reabsorbed from the tubules into the peritubular capillaries and the unwanted or toxic molecules are secreted into the lumen of the nephron.
- ◆ Water, sodium and potassium ions, urea, phosphates, citrate as well as organic molecules like glucose and amino acids are reabsorbed from the Proximal Convoluted Tubule (PCT).
- ◆ In addition PCT is the site of formation of ammonium and also involves the secretion of excess medicines from blood.
- ◆ The filtrate then enters into the descending loop of Henle, where absorption of water from the filtrate to the tissues takes place. This water is transferred by the cells to the capillaries surrounding them.
- ◆ The filtrate then travels through the ascending loop of Henle which is permeable to water. Hence, only ions diffuse out into the surrounding cells.
- ◆ While passing through "Distal Convoluted Tubule" (DCT), the surrounding tissues further facilitate the exchange of water and ions from the filtrate to capillaries.
- ◆ The tissues also absorb the excess potassium and hydrogen ions from the capillaries and secrete them into the filtrate.
- ◆ The filtrate from several nephrons is then collected into the common collecting duct which empties into the minor calyces and is subsequently collected into the bladder as urine.

(OR)

Q. Make a flow chart to show the cell cycle and explain cell division describing different stages of mitosis.

A: Cell cycle:



Different stages of cell division in mitosis are prophase, metaphase, anaphase and telophase.

Stage	Description
1. Prophase	1. Chromosomes contract, spiral and become visible even in light microscope and nucleoli become smaller. 2. Chromosomes split lengthwise to form chromatids connected by centromeres. 3. Nuclear membrane disappears. 4. Centrosome, containing rod-like centrioles, divide and form ends of spindle. (animal cells only)
2. Metaphase	1. Chromosomes move to spindle equator centromeres attached to spindle fibers.
3. Anaphase	1. Centromeres split to separating the chromatids. 2. Spindle fibers attached to centromeres contract, pulling chromatids towards poles.
4 Telophase	1. Chromatids elongate, become invisible. 2. Nuclear membranes form round the daughters nuclei. 3. Cell membrane pinches into form daughter cells or new cell wall material becomes laid down across spindle equator. 4. Nucleus divides into two and division of cytoplasm starts.

15. What are the different modes of a sexual reproduction cite them with examples.

A: **Asexual reproduction takes place by 6 different methods:** They are 1) Fission 2) Budding 3) Spore formation 4) Regeneration 5) Fragmentation 6) Vegetative propagation.

Fission: Single celled organisms split into two equal offsprings or more offsprings.

e.g.: Bacteria, Paramecium.

Budding: A growth on the body as a bud grows to form identical copy of parent.

e.g.: Yeast.

Spore formation: Spores are produced in sporangium.

e.g.: Rhizopus, mucor, bacteria, ferns and mosses.

Regeneration: Ability of organisms to give rise to new individual organisms.

e.g.: Hydra, flatworm.

Fragmentation: New individual growth from a separate piece of parent organism.

e.g.: Flatworms, moulds, lichens, spirogyra.

Vegetative propagation:

A) Natural propagation:

i) **Leaves - e.g.:** Bryophyllum

ii) **Stems - e.g.:** Stolon → valisneria, strawberry

Bulbs → onion

Corns → colacasia

Tuber → potato

B) Artificial propagation:

i) **Layering: e.g.:** Nerium, guava, orange, rose

ii) **Cutting: e.g.:** Rose, Hibiscus, Sugarcane

iii) **Grafting: e.g.:** Sapota, Guava, mango

(OR)

Q. Explain monohybrid experiment with an example. Which law of inheritance can we understand? Explain.

A: ♦ Cross pollinating a pure breed of tall (TT) and dwarf (tt) plants gave, F₁ generation in which all the plants are heterozygous tall.

♂	t	t
♀	Tt	Tt
T	Tt	Tt
T	Tt	Tt

♦ These plants on self pollination gave F₂ generation in which 75% of plants are tall and 25% of plants dwarf.

♦ Out of 75% tall plants 25% of plants are homozygous tall (TT) and remaining 50% are heterozygous tall (Tt, tT).

♦ The remaining 25% dwarf plants are homozygous dwarf (tt).

♂	T	t
♀	TT	Tt
T	TT	Tt
t	Tt	tt

♦ So the phenotype ratio in F₂ generation is 3 : 1, whereas genotype ratio is 1 : 2 : 1.

♦ These plants on self pollination gave F₃ generation, where a set of 25% tall plants gave only tall plants, rest of the tall plants gave 75% tall and 25% dwarf plants and a set of dwarf plants gave only dwarf plants.

- ◆ With this experiment we can understand two laws of inheritance. One is law of dominance and the second one is law of segregation.
- ◆ As only one trait is expressed in the offspring of first generation crosses; we can assume that among a pair of alleles for a character, only one expresses itself in the first generation one of the allele is dominant over the other. This is Mendal called "Law of Dominance".
- ◆ The law of segregation states that every individual possesses a pair of alleles for any particular trait and that each parent passes a randomly selected copy of only one of these to its offspring.

16. What experiment do you perform to understand action of saliva on flour? Explain its procedure and apparatus that you followed.

A: Experiment to understand action of Saliva on flour:

Aim: To demonstrate the action of Saliva on flour.

Apparatus: Test tubes – 2, flour, watch glass, dil. tincture iodine, saliva (1 – teaspoonful).

Procedure:

- ◆ Take a test tube half filled with water and add a pinch of flour to it.
- ◆ Shake the test tube well till the flour gets mixed.
- ◆ Take a few drops of this mixture in a watch glass and test for the presence of starch by putting a drop of dilute tincture iodine in it.
- ◆ A blue – black colour confirms the presence of starch.
- ◆ Now again dissolve a pinch of flour into half filled water in a test tube.
- ◆ Now divide the mixture into two equal halves by transferring it to another test tube.
- ◆ Note that both the test tubes have the same amount of solution.
- ◆ Add a teaspoon of Saliva to one of the test tube and mark it.
- ◆ Do not add anything in the other test tube.
- ◆ After some time add a drop of dilute tincture iodine solution to test tubes containing the solution.

Observation:

- ◆ The solution of the test tube to which saliva is added shows colour change as starch is converted to sugar.
- ◆ There is no colour change in the other test tube to which saliva is not added.

Result: The enzyme amylaze in the saliva breaks down the starch molecules into smaller subunits usually into sugars.

(OR)

Q. What procedure do you follow to understand the effect of plant growth hormones (in agar median) in the terminal portion of the tip of stem (Coleoptile)?

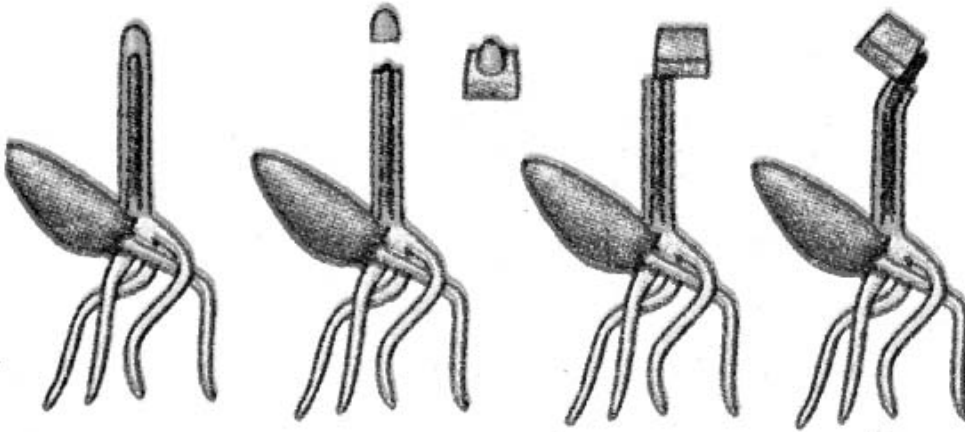
A: Aim: To show the growth of Avena coleoptile involves a chemical substance.

Apparatus: Oat seedlings, coleoptile, a slice of agar, a sharp blade.

Procedure: Take some seedlings of coleoptile cut the tips by using a sharp blade. Place the tips on a slice of agar and leave them for about an hour. Cut the agar into small blocks and place a block on the side each stump of the decapitated plants. They were kept in the dark during the entire experiment.

Observe the plants after one hour.

Observation: It is observed that a distinct bending away from the side on which the agar block was placed.



Agar block that had not been in contact with coleoptile tip produced either no bending or only a slight bending towards the side on which the block had been placed.

Conclusion: The coleoptile tip exerted its effect by means of a chemical stimulus such as an electrical impulse. This chemical stimulus came to be known as "auxin".

17. Prepare a cartoon on Pavlov's experiment with a suitable caption.

A: "Conditional actions comes by learn".



(OR)

Q. Proper utilisation of natural resources is the way to show gratitude to our nation. Can you support this statement? Give your argument.

A: A resource is a source or supply from which benefit is produced. Typically resources are minerals services, staff or other assets that are transformed to produce benefit and in the process may be consumed or made unavailable.

Benefits of resource utilisation may include increased wealth, meeting needs, proper functioning of a system or enhanced well-being.

From human perspective a natural resource is anything obtained from the environment to satisfy human need and wants.

The earth natural resources include air, water, soil, minerals, fuels, plants and animals. Conservation is the practice of caring for these resources so all living things can benefit from then now and in the future.

If resources are carelessly managed. Many will be used up. It used wisely and efficiently renewable resources will last much longer.

Though conservation, people can reduce waste and manage natural resources wisely.

PART – B

ANSWERS

1-C, 2-B, 3-D, 4-B, 5-B, 6-A, 7-C, 8-D, 9-B, 10-C.

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