

09 | E | I

Time - 2 Hour

Name : Class : Index No:

- From the above characteristics, which are common to both mRNA and tRNA?

- 1) A and B only. 2) B and C only. 3) B and D only.
4) A and D only. 5) A, C and D only.

05. The organelles involved in performing the following functions, in correct sequence is
- ❖ Transport vesicle production
 - ❖ Detoxification
 - ❖ Lysosome production
 - ❖ Photosynthesis in plants
 - ❖ Digestion of worn-out organelles
- 1) Smooth endoplasmic reticulum, Rrough endoplasmic reticulum, Golgi apparatus, Peroxisomes, Lysosomes.
- 2) Smooth endoplasmic reticulum, Peroxisomes, Rough endoplasmic reticulum, Golgi apparatus, Lysosomes.
- 3) Rough endoplasmic reticulum, Smooth endoplasmic reticulum, Golgi apparatus, Peroxisomes, Lysosomes,
- 4) Rough endoplasmic reticulum, Smooth endoplasmic reticulum, Peroxisomes, Golgi apparatus. Lysosomes.
- 5) Smooth endoplasmic reticulum, Rough endoplasmic reticulum, Golgi apparatus, Lysosomes, Peroxisomes.
06. The correct statement regarding cell junctions is
- 1) The tight junctions in animal embryos allow the exchange of materials between adjacent cells.
- 2) The microfilaments of desmosomes mechanically connect the cytoskeleton of adjacent cells.
- 3) Plasmodesmata contribute to the transport of substances through the symplast and membranes.
- 4) Tight junctions are found in muscle tissue.
- 5) Connects animal cells with their external environment.
07. The answer given in the order of events related to the meiosis division is,
- A. The sister chromatids of each chromosomes move towards opposite poles.
- B. Haploid two daughter cells are formed.
- C. Sister chromatids are attached to microtubules extending from both poles.
- D. Kinetochore microtubules begin to shorten.
- E. Homologous chromosomes move slightly away from each other.
- 1) E, D, B, C, A 2) C, E, D, A, B 3) B, A, E, C, D
- 4) C, E, B, D, A 5) B, A, E, D, C
08. The incorrect statement regarding the mechanism of enzyme action is,
- 1) Only a few amino acids form the active site.
- 2) The specificity of an enzyme results from its shape..
- 3) The active site of the enzyme is always completely complementary to the substrate.
- 4) Enzymes always lower the activation energy of a reaction.
- 5) Certain enzymes require non-proteinuos components called cofactors for their activity.

09. The pair that correctly represents the order of electron flow in linear electron flow is,

- 1) P 680⁺ —————> The primary electron acceptor in photosystem 1
- 2) P 680 —————> H₂O
- 3) P 700 —————> NADP⁺
- 4) H₂O —————> P 680⁺
- 5) The primary electron acceptor in photosystem 11 —————> ATP

10. Which statement is correct regarding the evolution of biological diversity ?

- 1) The increase in the amount of O₂ in the atmosphere was due to the accelerated origin of green algae.
- 2) The dissolved Fe²⁺ ions were oxidized as a result of photosynthesis.
- 3) The earliest tetrapods emerged 360 million years ago.
- 4) The human species originated about 6-7 million years ago, separating from other primates.
- 5) Prokaryotic cells have the ability to evolve with a wider range of morphological diversity than eukaryotic cells.

11. The answer that includes Linnaeus' contribution to the history of classification is.

- A. Classifying living organisms into plants and animals.
- B. Introducing the taxon of the phylum.
- C. Classification of flowering plants based on the reproductive structures of a flower.
- D. Classify plants according to the taxonomic hierarchy of species, genus, family, order and class.

- 1) A and C only
- 2) B and D only.
- 3) C only
- 4) D only.
- 5) A, C and D only.

12. Which answer contains only phyla, included organisms possess an unsegmented body ?

- 1) Cnidaria, Platyhelminthes, Annelida
- 2) Echinodermata, Arthropoda, Platyhelminthes
- 3) Arthropoda, Mollusca, Cnidaria
- 4) Nematoda, Mollusca, Echinodermata,
- 5) Mollusca, Platyhelminthes, Annelida

13. Several types of plant tissues and their functions are shown below.

Tissue type	Function
A-Lateral meristems	P - Gaseous exchange
B-Dermal tissue	Q- Mechanical support
C-Parenchyma tissue	R - Formation of the periderm
D-Xylem tissue	S - Transport water radially.

Select the response that correctly represents all the "tissue type - function" combinations.

- 1) C-Q, A-S, B-R, D-P
- 2) A-Q, B-R, C-P, D-S
- 3) A-R, B-Q, C-S, D-P
- 4) A-R, B-P, C-S, D-Q
- 5) A-S, B-P, C-R, D-Q

14. Select which of the following statement/s is/are correct.

- a. The collenchyma cells present inside the epidermis of a dicotyledonous root provide support.
- b. The roots and stems of all dicotyledonous plant species undergo secondary growth.
- c. The cells of the vascular cambium, which are located perpendicular to the axis of the stem or root, contribute to the connection of secondary tissues to each other.
- d. The cells of the heart wood are adapted to protect the central part of the plant from fungal infections.
- e. The age of plants growing in tropical regions can be estimated by counting annual rings.

- 1) a, b, d and e only
- 2) c, d and e only
- 3) c and d only.
- 4) d and e only.
- 5) d only.

15. Select the correct answer based on the following two statements.

- A. When a flaccid cell is immersed in pure water, the water potential of the cell is zero at equilibrium.
- B. The turgor pressure and the solution potential are same of every fully turgid cell found in nature.

- 1) Both A and B are correct, and B contributes to A.
- 2) Both A and B are correct, but B does not contribute to A.
- 3) A is correct and B is incorrect.
- 4) A is incorrect and B is correct.
- 5) Both A and B are incorrect.

16. Which of the following statements regarding the phloem translocation is correct?

- 1) The loading of sugar from the leaf mesophyll cells into the sieve tube element always occurs via plasmodesmata by diffusion.
- 2) The sap of the phloem is transported through the sieve tube element according to a solute concentration gradient.
- 3) Osmosis is not an important factor in the translocation of phloem sap.
- 4) The pressure in the sieve tubes is maximum at the sink.
- 5) Sugar molecules diffuse from the phloem to the sink along a concentration gradient.

17. Some characteristics of three plant species are shown below.

- P - The female gametophyte develop within the ovules present in the ovary. The gametophyte is a microscopic, short-lived structure.
- Q - The sporophyte is dominant and photosynthetic. The gametophyte is partially dependent on the sporophyte.
- R- The male gametophyte that develops within the pollen chamber of female sporophyte produces motile sperms.

P,Q and R plant species respectively,

- 1) *Cocos*, *Nephrolepis*, *Pogonatum*
- 2) *Nephrolepis*, *Pogonatum*, *Cocos*
- 3) *Dipterocarpus*, *Selaginella*, *Cycas*
- 4) *Dipterocarpus*, *Nephrolepis*, *Cocos*
- 5) *Cycas*, *Selaginella*, *Cocos*

18. From the following responses, select the response/responses initiated in plants by cryptochrome.
- Shade avoidance
 - Flowering.
 - Phototropism
 - Slowing of hypocotyl elongation.
 - Seed germination.

- | | | |
|------------|------------|---------|
| 1) a, b, c | 2) a, b, d | 3) a, b |
| 4) c, d | 5) a, d, e | |

19. Which of the following statement/s about animal tissues is/are correct?
- The alveolar tissue connects the epithelium and the underlying tissue.
 - Matrix of cartilage contains proteins and CaCO_3
 - Osteocytes are enclosed with in lacunae.

- | | | |
|------------------|-----------------------|-----------------|
| 1) A only. | 2) A and B only. | 3) A and C only |
| 4) B and C only. | 5) All of A, B and C. | |

20. The following are some of the components found in human food, the place where their digestion begins, and some of the enzymes that act first.

Component	Where digestion begins	Enzymes act
A - Polysaccharides	E- Small intestine	1-Nucleotidase
B - proteins	F- mouth	J- Trypsin
C - lipids	G- Stomach	k-disaccharidases
D. Nucleic acids	H - Duodenum	L- pancreatic nucleolus

Select the correct combination of the above.

- | | | | | |
|------------|------------|------------|------------|------------|
| 1) A, H, K | 2) B, G, I | 3) C, E, J | 4) D, E, L | 5) D, H, I |
|------------|------------|------------|------------|------------|

21. Circulatory systems that can be seen among the animals are given below.

- Open circulatory system
- Single circulation
- Closed double circulation

Select the response with the animals which possess A, B and C circulatory systems respectively,

- Grasshopper, Snail, Crow
- Spider, Earthworm, Octopus
- Centipede, Shark, Bat
- Cockroach, Carp, *Nereis*
- Sea urchin, Turtle, *Ichthyophis*

22. Which of the following is correct regarding the respiration in animals?

- 1) Vertebrates use lungs, skin and gills for the exchange of respiratory gases.
- 2) Insects possess vascularized respiratory surfaces.
- 3) In large animals, surface area/volume ratio is high and thus respiratory structures with branching has been evolved.
- 4) Respiratory structures with surface invaginations has been evolved in aquatic organisms for efficient extraction of dissolved oxygen from water.
- 5) Earthworms exchange respiratory gases through their thin moist skin.

23. Which of the following are considered as non-specific defense mechanisms?

- A. Lysis of invaded cells by complement proteins through a cascade of biochemical reactions.
- B. Production of antibodies in response to natural infections of microbes.
- C. Production of interferons in blood due to viral infection.
- D. Inflammatory response to tissue damage.
- E. Injecting antivenin to treat poisoning from venomous snake bite.

- 1) Only C and D
- 2) Only B, C and D
- 3) Only A, C and D
- 4) Only C, D and E
- 5) Only B, D and E

24. Blood vessels associated with human nephron and their relevant functions are given below.

P – Afferent arteriole

E – Water reabsorption in the presence of ADH

Q – Efferent arteriole

F – Contribute to the maintenance of normal pH in the blood

R – vasa recta

G – Presence of blood cells

S – Network of peritubular capillaries

H – Supply blood to the nephron

I – Passive reabsorption of NaCl

Select the response with all correct 'blood vessel – relevant function' combinations.

- 1) P-G, Q-H, R-E, S-F
- 2) P-H, Q-G, R-I, S-F
- 3) P-I, Q-G, R-E, S-F
- 4) P-F, Q-I, R-E, S-H
- 5) P-E, Q-H, R-F, S-I

25. This is **not** a function of the hypothalamus,

- 1) Initiates fight-or-flight response.
- 2) Control of autonomic nervous system.
- 3) Regulate sleep and wake cycles.
- 4) Coordinates auditory and visual reflexes.
- 5) Regulate appetite.

26. The correct combination of 'hormone-function' is,
- 1) Prolactin – stimulate milk ejection.
 - 2) FSH – stimulate the progesterone secretion by the corpus luteum.
 - 3) ADH – stimulate the reabsorption of Na^+ by the distal convoluted tubule.
 - 4) Melatonin – coordination of diurnal rhythms of many tissues.
 - 5) LH – stimulate spermatogenesis.
27. Which of the following is the correct statement regarding the fluid produced by the seminal vesical ?
- 1) It is a thin, milky-white, clear fluid.
 - 2) It is released directly into the urethra.
 - 3) It produces citrate for the nourishment of sperm.
 - 4) It contains ascorbic acid and prostaglandin.
 - 5) It contains anticoagulant enzymes.
28. The correct statement regarding the bones of the human skull,
- 1) The bones which bear sinuses are ethmoid bone, sphenoid bone and zygomatic bones.
 - 2) Temporal bone possesses styloid process, mastoid process and temporal process.
 - 3) Maxilla and mandible are movable bones.
 - 4) Fontanelles in the cranium of babies become ossified within 1-2 years of life.
 - 5) The articular surface of the mandible give attachment to muscles.
29. Select the **incorrect** statement regarding the sternum.
- 1) Forms the anterior part of the thoracic cage.
 - 2) The manubrium articulates with the clavicles in the pectoral girdles and the first pair of ribs.
 - 3) Provide protection to the heart, lungs and blood vessels.
 - 4) The main site for production of red blood cells.
 - 5) The middle part gives direct attachment to 5 pairs of ribs.
30. If one in a population of 2500 suffer from cystic fibrosis, find the percentage of the carriers.
- 1) 2%
 - 2) 8%
 - 3) 4%
 - 4) 16%
 - 5) 12%

31. Which of the following is **incorrect** regarding inbreeding?
- 1) It is the breeding among genetically similar individuals.
 - 2) It gives the meaning self-fertilization.
 - 3) Continued inbreeding reduces genetic fitness of the population.
 - 4) Inbreeding increases heterozygosis.
 - 5) Help accumulation of superior genes
32. Several steps in the DNA replication process is given below. Select the correct order of DNA replication
- A. Stabilization of single stranded DNA
 - B. Sealing gap between the adjacent nucleotides
 - C. Priming of DNA synthesis by a RNA primer
 - D. Unwinding of the double helix
 - E. Extension of new DNA strand
- 1) A, D, E, B, C
 - 2) C, A, D, E, B
 - 3) D, A, E, C, B
 - 4) D, A, C, E, B
 - 5) D, B, C, E, A
33. The correct statement regarding Sickle Cell Anaemia,
- 1) A mutated allele of a gene coding for α globin subunit of haemoglobin causes this condition.
 - 2) Occurs due to a chromosomal mutation known as deletion.
 - 3) This a mutation occurs due to the substitution of glutamic acid with valine.
 - 4) The mutated allele shows incomplete dominance.
 - 5) Individuals with homozygous wild type alleles survive malaria attacks.
34. The correct statement regarding the application of GMO in medicine,
- 1) Production of human insulin by using *Saccharomyces*.
 - 2) Use of tissue plasminogen activator to treat heart attack.
 - 3) Use of GM mammalian cells to extract factor VI.
 - 4) Reduction of the malaria vector population by 95% due to employment of GM sterile insect technology.
 - 5) The Chymosin gene from cattle engineered in yeast cells.
35. In which of the following biome have most of its plants with C₄ photosynthetic pathway?
- 1) Tropical forests
 - 2) Savanna
 - 3) Desert
 - 4) Chaparral
 - 5) Tundra

36. Salt marshes in Sri Lanka,
- 1) Are found in large lagoon areas with low wave action.
 - 2) Crystals of salts are formed during the dry season.
 - 3) Are areas with high rainfall and high wind.
 - 4) Abundance of plants that appear like grasses with succulent bodies
 - 5) Disturbed by parking of fishing boats.
37. An organism which is considered as critically endangered in Sri Lanka,
- 1) Blue magpie.
 - 2) Dusky striped jungle squirrel.
 - 3) Marbled rock frog.
 - 4) Indian pitta.
 - 5) Snake head.
38. The response with 'Ecosystem - The plants grown' combination correctly matched,
- 1) Swamp forests – Cogon grass.
 - 2) Dry patina – Tussock grass.
 - 3) Savanna – Citronella grass.
 - 4) Tropical thorn scrubs - Keena.
 - 5) Dry monsoon forests - Walkurudu
39. This is **not** an advantage of smoking as a food preservation method,
- 1) Antioxidants present in the smoke contribute for the preservation food.
 - 2) The hydrocarbons of burning wood enhance the taste.
 - 3) Used in the preservation of fish and meat.
 - 4) Destroys microbes by causing osmotic stress on microorganisms.
 - 5) Enhances the taste and aroma by cooking.
40. Select the response with correct statements regarding the use of nanotechnology.
- A. Since Nano-carrier systems can be transferred to the airways; respiratory diseases can be treated.
 - B. In the treatment of diabetes, Nano shells are used to release insulin.
 - C. Spherical nanoparticles consisting of a dielectric core are used in the treatment of pain.
 - D. Nanoparticles are used to unclog blocked arteries and detect and eliminate cancer cells.
- 1) A and B.
 - 2) B and C.
 - 3) C and D.
 - 4) A and D
 - 5) B and D

For each of the questions 41 to 50 one or more of the responses is/are correct. Decide which response/responses is/are correct and then select the correct number.

- If only A, B and D are correct1
 If only A, C and D are correct2
 If only A and B are correct3
 If only C and D are correct4
 If only other response or combination of responses is correct5

1	2	3	4	5
A, B, D correct.	A, C,D correct.	A, B correct.	C,D correct.	Any other response or combinations of responses correct.

41. What is/ are the correct statement/ statements regarding carbon fixation in plants ?

- (A) The 3-PGA which is produced in carboxylation in C_3 plants is converted into 1,3-bisphosphoglycerate by NADPH which is formed in light reaction.
 (B) C_4 plants contain a high content of organelles in the mesophyll cells to maintain high CO_2 concentrations around Rubisco.
 (C) The bundle sheath cells of C_4 plants contain decarboxylation enzymes as well as carboxylation enzymes.
 (D) The chloroplast grana in C_4 plants are comparatively large.
 (E) In mesophyll cells, extra ATP is produced by cyclic electron flow.

42. The phylum/ phyla bear chitinous structures is/ are,

- (A) Ascomycota (B) Arthropoda (C) Echinodermata (D) Mollusca (E) Annelida

43. The correct combination of the essential nutrient, function and the deficiency symptom is,

Essential nutrient	Function	Deficiency symptom
(A) Fe	Synthesis of chlorophyll	Chlorosis between veins young leaves
(B) Ca	Maintenance of permeability of Plasma membrane	Crinkling of young leaves
(C) Mg	Components of coenzymes	Stem thinning
(D) Zn	DNA transcription	Reduced internode length
(E) Cl	N fixation in photosynthesis	Short, stubby roots

44. Which of the following can be happened when ethylene is applied externally to a plant?

- (A) Retards leaf abscission (B) Fruit growth (C) roots and root hairs formation
 (D) Early leaf fall (E) Growth inhibition

45. Which vitamin/ mineral deficiency can affect the structure of human bones and teeth?

- (A) Calcium (B) Phosphorus (C) Ascorbic acid (D) Fluorine (E) Vitamin D

46. The correct statement/ statements regarding human Kidneys is/ are ?
- (A) Renal Cortex is granulated
 - (B) Apices of pyramids project into the renal pelvis through renal papillae.
 - (C) Medulla has a striated appearance due to the presence of large number of glomeruli.
 - (D) All parts of the cortical nephrons are located only in the cortex.
 - (E) Juxta medullary nephrons reach short distance to the medulla.
47. Correct regarding mechanoreceptors ?
- (A) Missner corpuscles are sensitive to light pressure.
 - (B) Pressure receptors are located close to the surface of the skin.
 - (C) Merkel discs are sensitive to light touch.
 - (D) Pacinian corpuscles are sensitive to large pressure changes.
 - (E) Vestibule of the Corti organ detects sound vibrations
48. What is/ are the correct answer about Mendelian characteristics in humans.
- (A) Bent thumb is a dominant characteristic.
 - (B) The absence of dimples is a dominant characteristic.
 - (C) The absence of widow's peak occurs when homozygous recessive.
 - (D) Attached earlobes is a recessive trait.
 - (E) Non-rolling tongue is a dominant characteristic.
49. The correct statement/ statements on invasive alien species is/ are?
- (A) Spreads rapidly outside its native geographic environment.
 - (B) Human intervention in the environment is being turned to its advantage.
 - (C) They change the services and ecosystem values of their environment wherever they invade.
 - (D) They are considered a major cause of biodiversity loss.
 - (E) Helps maintain the stability of an ecosystem.
50. The enzyme/ enzymes produced by the bacteria *Aspergillus oryzae* is/ are?
- (A) Lipase
 - (B) Invertase
 - (C) Amylase
 - (D) Protease
 - (E) Cellulase

Part A - Structured Essay**Answer all the questions****01 (A)**

i. What is sustainable food production?

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ii. Movement of living organisms occurs through the integration of nerves, muscles and bones. Write the characteristic of organisms related to this.

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iii. State the properties of water relevant to the following situations.

a) Preventing plants from overheating due to sunlight.

.....

b) Water molecules surround each solute molecule and form hydrogen bonds with them.

.....

iv. a) How does the aqueous form of some monosaccharides differ from their solid form?

.....

b) What are the main reasons lipids differ chemically from carbohydrates?

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v. Mention 2 structural features of a protein that has quaternary structure.

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vi. What is the rule of base pairing in nucleic acids?

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(B)

i. What is the resolution of an electron microscope?

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ii. State the reason why the structure of the plasma membrane is called the fluid mosaic model.

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iii.

a) Why is the structure of the cilia called $9 + 2$?

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b) Write 2 structural features of the microtubules that make up the cytoskeleton.

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c) Mention a use of the conversion of ATP energy into light.

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iv.

a) Name 3 main events that occur in the anaphase II of meiosis in a cell except shortening of microtubules.

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b) How does a competitive inhibitor decrease the rate of an enzyme reaction?

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V. a) Mention the molecules that are oxidized separately in photosystems I and II and write the difference between them.

Photosystems I.

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Photosystems II:

.....

b) What apparatus is used to determine the rate of photosynthesis?

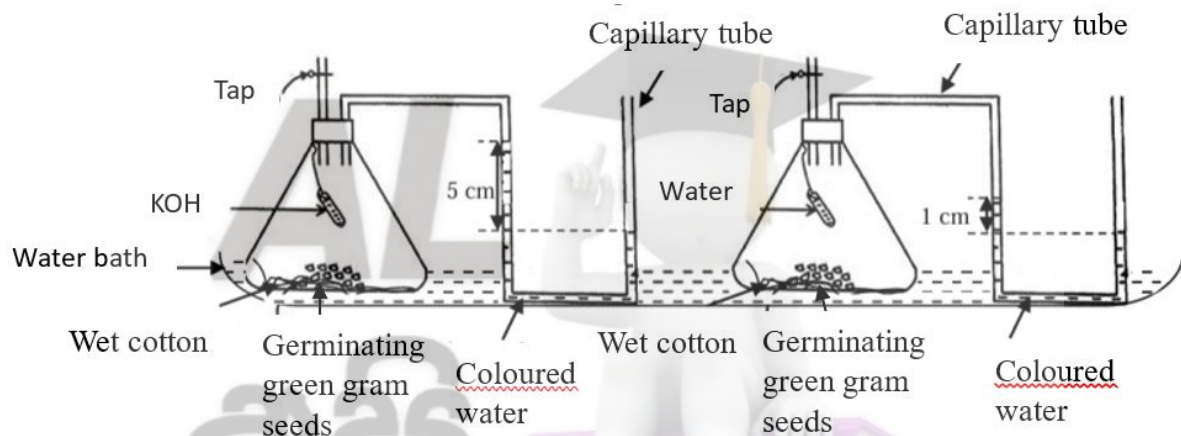
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c) How can CO_2 be prevented from becoming limiting when performing the experiment in the laboratory?

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(C)

i. The following is an observation made about 10 minutes after setting up a experiment setup to find respiratory quotient using germinating green gram seeds.



a) Show how to calculate the respiration quotient of germinating green gram seeds based on the change in the level of colored water in the arms of the capillary tube.

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b) What could be the respiratory substrate that is being respiration in?

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ii. Name the eon that started the increase in atmospheric O_2 concentration.

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iii. Mention the morphological concept for a species.

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iv. How was the transport of materials through the xylem and phloem beneficial to seedless vascular plants ?

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v. Write the genus name of a seedless vascular plant with feathery leaves.

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02 (A)

i. What are the characteristics of Gnetum that are similar to phylum Anthophyta plants?

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ii. Name 3 structures found in sexual reproduction in basidiomycota

.....

.....

.....

iii. What is the function of the cnidocytes ?

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.....

iv. Briefly describe the nature of the excretory structure found in the phylum Nematoda.

.....

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.....

v. State the location and nature of the notochord of chordata.

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(B)

i. Indicate the location water moves from the following cells to adjacent cells of the same type.

Vessel element :

Tracheids :

ii. Indicate the location of vascular tissues in a cross-section of a primary root of a dicotyledonous plant.

Xylem :.....

Pholem:.....

iii. In determining the water potential of *Rhoeo* lower epidermal cells, name the readings obtained after the epidermal peels reaches equilibrium with the sucrose solution.

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iv. Name the three components that are important for ascent of xylem sap.

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v.a) What is the main reason for the emergence of a distinct diploid sporophyte generation in a plant life cycle?

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.....

b) State the ploidy level in the following structures.

❖ Indusium :.....

❖ *Cycas* Integument:.....

c) What is photomorphogenesis ?

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.....

(C)

i. State a function common to cartilage tissue and bone tissue.

.....
.....

ii.a) Name the site where the enzyme that catalyzes each of the following functions.

❖ DNA → deoxyribonucleotides

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❖ Small peptides → amino acids

.....

b) Mention 2 functions of water in the human body.

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c) Write a major difference between blood plasma and interstitial fluid, except cellular components.

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iii. How does venous blood in the coronary circulation return to the heart?

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iv. a) Mention the types of respiratory pigments found in vertebrates and indicate how they are functionally different.

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.....

b) State the amount of red blood cells in human blood.

.....

v.a) State the effect on respiration in each of the following situations.

❖ Decreased blood pH

.....

❖ Very low oxygen concentration in the blood

.....

b) What is the residual volume?

.....

.....

03 (A)

i Indicate how the following component functions in first-line defense.

❖ Lysozyme:.....

❖ HCl :.....

ii. State the reasons why pain occurs near the damaged tissue during the inflammatory response.

.....
.....

iii. What are the cells that respond to primary immune response in cell-mediated immune responses?

.....

iv. State the location of the excretory structures found in crustaceans.

.....
.....

v. Name an ion that contributes to maintaining normal blood volume by actively entering the peritubular capillary network.

.....

(B)

i. Name the order in which light rays from an object in front of the eye undergo refraction as they travel to the retina.

.....

ii. Briefly describe the processing that must occur in the eye for the process of seeing an object that is close to the eye.

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.....

iii. Describe the sequence of vibrations that pressure waves travel from a vibrating object to the auditory hair cells to produce sound.

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iv. a) What are the main asexual reproductive methods found in invertebrates?

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.....

b) Name 2 places where the hCG hormone is produced.

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c) Name the two assisted reproductive technologies used as treatments for infertility.

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d) State the main difference between the above two methods.

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v.a) Name 3 functions that are unique for the human skeletal.

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b) What are the cranial bones in the skull that hold sinuses ?

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vi. a) State 2 structural features that differentiate the atlas vertebra from the typical cervical vertebra.

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b) Name two adaptations of the foot that support the weight of the body in an upright position.

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(C) i. How to distinguish between incomplete dominance and codominance ?

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ii. Name the genetic disease that causes infertility in women.

.....

iii. a) Name the synthetic chemicals used to induce polyploidy in plant breeding.

.....

b) What is the importance of polyploidy in horticulture.

.....

.....

iv) Mutation induction techniques have the potential to produce new sources of genetic variation needed for crop plant breeding.

Name a type of ionizing radiation and a chemical substance used for this purpose.

❖ An ionizing radiation :.....

❖ A chemical substance :.....

v.a) What is interspecific breeding?

.....
.....

b) State the result organism of the following interspecific breeding.

1) Between the lion and the female tiger :.....

2) Between *Malus asiatica* and *Malus pumifolia* :.....

04 (A)

i. a) What is transformed cell?

.....
.....

b) Name the DNA delivery technique/system related to the following methods.

X. Insertion of foreign DNA based on plant infection.

.....

Y. Taking in DNA from its surroundings through the cell membrane.

.....

Z Bacteriophages insert DNA into bacterial cells.

.....

ii. Give two examples of cases where genetic engineering has been used to increase crop yields in agriculture.

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iii. Name the bacteria commonly used to produce plants resistant to pests and indicate how it harms the pest.

Bacteria :

Harm:

(B) i. a) Name 2 biomes that are naturally prone to fire during the dry season.

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.....

b) Give reasons for the following structural adaptations shown by conifers.

❖ Conical in shape :.....

❖ Needle like leaves:.....

ii.a) Mention one major grass species each that grows in wet and dry patana grasslands.

❖ Wet patana grasslands :.....

❖ Dry patana grasslands :.....

b) Give 2 examples of plants that are adapted to grow in water logged in the marshes of Sri Lanka.

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iii. Mention 2 special characteristics of the soil in marshes.

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iv. a) Describe what a vulnerable taxon is.

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b) Name vulnerable animal that lives in Sri Lanka.

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v. Mention two ways in which diseases caused by prions can be transmitted from human to human.

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vi. Name the two pasteurization methods and state the conditions used in them.

Method

Conditions

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(C)

i. What is the adverse effect of exotoxin produced by *Clostridium tetani* on humans?

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ii.a) What is the main reason why antiseptics differs from disinfectants?

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b) Name one type of antibiotic that exhibits the following modes of action.

❖ Inhibition of protein synthesis in bacteria :.....

❖ Disruption of the plasma membrane of bacteria :.....

c) What is the main difference in vaccination inactivated vaccines compared to live attenuated vaccines?

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iii. What is the importance of using bacteria in extracting fiber from plant materials through retting ?

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iv. What is the reason for the presence of a layer of blue-green phytoplankton on the surface of the plants and on the side glass of the aquarium?

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v. a) Name 3 substances used as organic compounds in the preparation of tissue culture medium.

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b) What is the important incident must occur when grafting two plants?

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vi. Name 2 uses of nanocomposites

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Grade 13

(c) Tissue culture