

ගම්පහ අධ්‍යාපන කලාපය
Gampaha Education Zone

Second Term Evaluation - 2025

Grade

13

විෂයය
Subject

Biology-I

කාලය
Time

2 hours

1. Select the cause for the presence of liquid water below the ice layer in a pond during winter season
 1. Cohesive behavior
 2. Ability to moderate temperature
 3. Endothermic nature of fish
 4. Expansion upon freezing
 5. Versatility as a solvent
2. Select the monomer unit of biopolymer having only C H O and N
 1. Glucosamine
 2. Fructose
 3. Galacturonic acid
 4. Ribonucleotide
 5. Methionine
3. **Correct** order of the steps of preparing an epidermal peel to observe via light microscope
 - a- Put the epidermal peel into watch glass with water
 - b- cover the water drop with epidermal peel with cover slip
 - c- take thin epidermal peel from the lower epidermis
 - d- transfer the epidermal peel using fine paint brush on to the water drop
 - e- keep a water drop at the center of glass slide
 1. A, B, E, D, C
 2. C, A, E, D, B
 3. C, B, E, A, D
 4. C, A, E, B, D
 5. A, B, E, C, D

4. Select the answer with **only** structural polysaccharides
1. Cellulose, Hemicellulose, Glycogen
 2. Pectin, Amylose, Chitin
 3. Chitin, Hemicellulose, Pectin
 4. Amylose, Glycogen, Cellulose
 5. Amylopectin, Amylose, Cellulose
5. Following are some steps in cell division process. Select the **correct** order of steps regarding to the meiosis
- a- Join the microtubules which are coming from both poles to the kinetochores
 - b- Chiasmata can be observed in the area with crossing over
 - c- Move the sister chromatids to opposite poles
 - d- Segregation of homologous chromosomes
1. a, b, c, d 2. b, a, c, d 3. c, b, a, d 4. d, a, c, b 5. b, d, a, c
6. Select the **correct** statements related to the photosynthesis
- a- There is no any enzyme catalyzed reaction during light reaction
 - b- ATP is used for all three steps of Calvin cycle
 - c- In C4 plants there is a mechanism to concentrate carbon dioxide surround Rubisco enzyme
 - d- Only PEP carboxylase does the catalytic reaction during C4 carbon dioxide fixation
1. a, b and d 2. b and c 3. b, c and d 4. a, c and d 5. a and b
7. An adaptation of C4 bundle sheath cells to reduce the photo respiration
1. Carbon dioxide fixation happens twice
 2. Well differentiated to do the light reaction
 3. Rubisco activates in high efficiency
 4. Having chloroplast with rich grana
 5. Absence of photosystem I
8. **Incorrect** about the allosteric regulations of enzymes
1. Most enzymes which are regulated by allosteric regulation, formed by two or more sub units
 2. The molecules that regulate the enzyme activation act as non-competitive reversible inhibitors
 3. Production of end products is regulated by feedback inhibition
 4. ADP act as allosteric activator and bind with regulatory site via covalent interaction
 5. In cooperativity, binding of one substate with an active site stimulates other active sites also

9. **Not** a biological process that uses energy
1. Movement using flagella
 2. K^+ move into guard cells
 3. Protein synthesis
 4. Movement of some materials via plasma membrane
 5. Thermoregulation
10. Select the criterium of modern classification system
1. Presence or absence of Red Blood Cells
 2. Unicellular and multicellular nature
 3. Amino acid sequence of common proteins
 4. Plant habit
 5. Prokaryotic and eukaryotic organization
11. Select the answer with haploid, diploid and triploid plant structures respectively
1. Capsule of *Pogonatum* , *Nephrolepis thallus*, *Cycas* endosperm
 2. Gametophyte of *Gnetum*, *Selaginella* male gametophyte, Anthophyta endosperm
 3. *Selaginella* microspore, *Pinus* megasporangium, *Cycas* embryo sac
 4. *Nephrolepis* spore, *Cycas* leaves, Anthophyta endosperm
 5. *Cycas* endosperm, sporangium of *Gnetum*, Anthophyta embryo sac
12. Select the **incorrect** statement about invertebrates
1. Gastrovascular cavity of Cnidaria is covered by endoderm
 2. Some Platyhelminthes animals having cilia for locomotion
 3. Most Mollusca having radula
 4. Arthropoda having periodic shedding of their exoskeleton
 5. All Echinodermata are aquatic, most are marine with few fresh water species
13. Select the **correct** statement related to water potential concept
1. Always pressure potential has a positive value
 2. Water potential is equal to solute potential in a cell at incipient plasmolysis
 3. Water potential of a system is determined by the number of water molecules
 4. Solute potential and pressure potential are equal in a flaccid cell
 5. Pressure potential is equal to water potential in a full turgid cell
14. *Cycas* life cycle is differed from *Selaginella* due to
1. Female gametophyte acts as endosperm after fertilization
 2. Heterosporous condition
 3. Formation of numerous microspores in microsporangia
 4. Having archegonia in female gametophyte
 5. Having flagellated sperms

15) The following table shows the plant genus, the gametophyte and the water requirement for reproduction.

| | Plant genus | | gametophyte | | The need for water for reproduction |
|---|--------------------|---|-----------------------------------|---|-------------------------------------|
| A | <i>Nephrolepis</i> | P | Photosynthetic gametophyte | X | No external water required |
| B | <i>Cycas</i> | Q | Non-photosynthetic gametophyte | Y | Only internal water is required. |
| C | <i>Selaginella</i> | R | Photosynthetic female gametophyte | Z | External water is required |

The letter combination that **correctly** matches the plant genus, gametophyte, and water requirement for reproduction is,

- (1) BQY (2) ARZ (3) AQY (4) BRY (5) CQY

16) Some of the responses of plants to mechanical stimuli are shown below. Which of them are **correct**

A- The stems of plants growing in windy environments are usually short and stockier

B - The directional growth of a tendril towards a support is tangential.

C - Collapsing of *Mimosa pudica* leaflets due to touch is tactile contractile movement.

D - A sheath wrapped around a support shows equal growth on opposite sides.

(1) A and B only.

(2) A and C only.

(3) B and C only.

(4) A, B and C only

(5) A, C and D only

17) Below are some responses on energy budget. The **correct** responses are:

a-Energy budget is the balance of energy intake versus energy expenditure of an organism.

b- The basic formula for the energy budget is $C = M + U + F + P$.

c - The symbol 'C' indicates the energy content in the food source from which it was obtained.

d- The M. U. P symbol in the the energy budget shows energy expenditure.

e-Energy budgets are used to estimate the energy available for growth and reproduction.

(1) a.b.c

(2) a.b.c.d

(3) a.b.c.e

(4) b.c.d

(5) a.d.e

18) Which of the following blood group can receive blood successfully from a person with blood group B positive

(1) B⁻

(2) O⁻

(3) O⁺

(4) A⁺

(5) AB⁺

19) Which of the following is **not** a complication of *Mycobacterium tuberculosis* infection of the human respiratory system?

- (1) Blood may be spitted with saliva.
- (3) Excessive sweating.
- (2) A racking cough
- (4) Difficulty in breathing.
- (5) Weight loss

20) Which of the following is **correct** about the forms of immunity?

- (1) Natural killer cells- engulf foreign molecules.
- (2) Cytotoxic T cells - directly kill the cells with the invading antigen.
- (3) Inflammatory response- Histamine and cytokinins act as signaling molecules.
- (4) Tears, saliva, mucus-Acts only as a chemical barrier.
- (5) Plasma cells- engulfing Cancer cells

21) Which of the following is **incorrect** about the human pancreas?

- (1) It is an exocrine and endocrine gland.
- (2) The hormone secretin regulates pancreatic function.
- (3) Damage to the cells in islets of Langerhans can causes diabetes.
- (4) Pancreatic juice is alkaline
- (5) The emulsifying agent in pancreatic juice facilitates the fat digestion

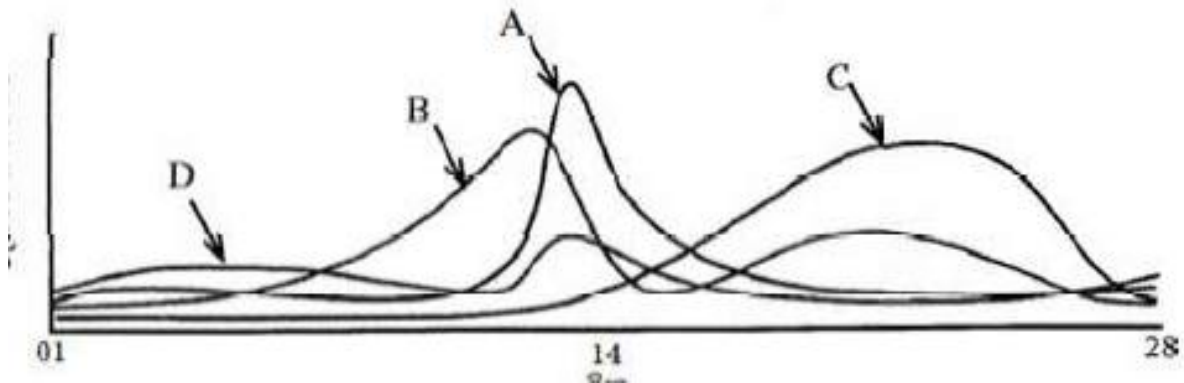
22) Which of the following could be a consequence of hypotention

- (1) Kidney damage
- (2) Unconsciousness
- (3) Internal bleeding
- (4) Increased heart rate
- (5) Stroke

23) Which of the following responses **correctly** matches the hormone and its main function?

- (1) Melatonin - Regulating biological rhythms.
- (2) Thymosin- regulates innate immunity.
- (3) Adrenaline -Reduce the rate of metabolism.
- (4) Oxytocin - Stimulates milk production.
- (5) Parathyroid hormone - reduces blood calcium levels.

24) This question is based on the diagram below, which shows the blood levels of hormones secreted by the anterior pituitary and ovaries during the normal reproductive cycle of mature women.



The hormones indicated by A, B, C and D respectively

- (1) FSH, LH, estradiol, and progesterone.
- (2) LH, progesterone, estradiol, and FSH.
- (3) Estradiol, LH, FSH, and progesterone.
- (4) LH, estradiol, progesterone, and FSH.
- (5) FSH, LH, progesterone, and estradiol.

25) Which of the following statements is **correct** about the human ear?

- (1) The inner ear is completely filled with perilymph
- (2) The only function of the ear ossicles is to transmit vibration waves from the tympanic membrane to the inner ear.
- (3) The cochlear hair cells on the tectorial membrane are in contact with the basilar membrane.
- (4) Sensory organs in the utricle and saccule detect angular movements.
- (5) Nerve impulses generated by stimulation of the auditory receptors in the organ of Corti are perceived by the temporal lobe of the cerebrum

26) The mineral elements required by the human body as component of electron carrier, component of thyroid hormones, for acid-base balance

- (1) Fe.F.S
- (2) Na. 1. Ca
- (3) Fe. I. Ca
- (4) Na, K, Cl
- (5) Fe. 1. Na

27) **Not** a change happens in the fetus during the second trimester.

- (1) Fetus assumes distinctively human features
- (2) The heart begins to beat.
- (3) The length of the stem is about 30 cm.
- (4) Organ systems are completely developed
- (5) mother may feel the fetal movements

28) The cell layers of the human retina arranged from the choroid towards the vitreous humour is **correctly** given.

- (1) The epithelial layer, bipolar cells, ganglion cells, photoreceptor cells
- (2) The photoreceptor cells, epithelial cells, ganglion cells, bipolar cells.
- (3) The epithelial layer, photoreceptor cells, bipolar cells, ganglion cells.
- (4) Ganglion cells, bipolar cells, photoreceptor cells, epithelial layer.
- (5) Epithelial layer, bipolar cells, photoreceptor cells, ganglion cells.

29) Which of the following statement is **correct** about asexual reproduction in animals

- (1) The generation of new organisms by a single parent
- (2) It can result in offspring with genetic variations
- (3) It confirms the evolution of species in changing environments.
- (4) It depends entirely on the meiosis
- (5) New organism can develop from sperm without fertilization.

30) Human red cell anemia can be explained under.

- (1) Epigenetics.
- (2) polygenic inheritance.
- (3) Epistasis
- (4) pleiotropy
- (5) Dihybrid

31) **Correct** about Hybrid vigour

- (1) A result of interspecific hybridization.
- (2) More vigour present in parents than F_1 generation.
- (3) Increment in heterozygosity is resulted
- (4) Vigour may decrease if the hybrids are mated together
- (5) This can be achieved by breeding among genetically similar individuals

(32) Which of the following definition is **incorrectly** given

- (1) Genetic locus -dynamic location of a gene on a chromosome.
- (2) homozygous -The condition of having two identical alleles for a given gene
- (3) Dominant allele - At heterozygous state, the allele which determines the organism's phenotype by masking the expression of the other allele
- (4) The gene- DNA sequence residing usually at a specific locus on a particular chromosome
- (5) Phenotype - Observable traits of an organism

(33) Which of the following statement regarding mutations is **unacceptable**

- (1) Mutations may change the length of a gene.
- (2) A nonsense mutation causes premature termination of protein synthesis.
- (3) Frameshift mutations render a polypeptide completely non functional
- (4) Ploidy level can also increase by abnormal separation of chromosomes.
- (5) A substitution always affects the functional forms of proteins.

(34) Which of the following enzymes is **not** required for the DNA replication process

- (1) Helicase
- (2) Ligase
- (3) restriction endonucleases
- (4) Topoisomerase
- (5) DNA polymerase

(35) The group that can survive and reproduce without nucleic acids is.

- (1) Virus
- (2) Prions
- (3) Viroids
- (4) Archeabacteria
- (5) Actinomycetes

(36) **Not** a process that occurs under aerobic conditions.

- (1) Secondary treatment in a trickling filter method
- (2) Nitrification by soil microorganisms
- (3) Biogas production in a sludge digester
- (4) Composting
- (5) Acetic acid fermentation

(37) Which of the following is **incorrect** about the forest ecosystems of Sri Lanka?

- (1) Some plants in the forests of the dry zone are deciduous.
- (2) Plants with twisted stems are dominant in certain forests in the intermediate zone of Sri Lanka.
- (3) In tropical wet rainforests, a layer of emergent can be seen above the canopy.
- (4) A continuous dense canopy is found in dry monsoon forests.
- (5) Recurrent fires are common in the dry season in the savanna ecosystems of Sri Lanka.

(38) **Not** a direct threat to loss of biodiversity,

- (1) Habitat loss
- (2) Desertification
- (3) Overexploitation
- (4) Introduction of invasive alien species
- (5) Environmental pollution

(39) *Escherichia coli*

- (1) An obligate anaerobic microorganism.
- (2) Vitamin E is synthesized in the human large intestine.
- (3) It is the first microorganism to enter the intestine of a newborn baby.
- (4) An opportunistic pathogen that can infect the lungs.
- (5) Ingestion in probiotics prevents diarrhea.

(40) Some of the plants used in the floriculture industry and their propagation methods are shown below. Which of the above combinations is **correctly** given

- (1) Corms - turmeric and croton
- (2) layering - African violets, Strawberry
- (3) Stolons - rose, *Cyanodon*
- (4) Grafting - Gladiolus, *Hibiscus*
- (5) leaf cutting - *Sansevieria*, Begonia

❖ The responses for questions **41** to **50** should be chosen as follows. One or more responses could be correct.

- | | | |
|--|---|---|
| If only A , B and D are correct | - | 1 |
| If only A , C and D are correct | - | 2 |
| If only A and B are correct | - | 3 |
| If only C and D are correct | - | 4 |
| If any other response or combination of responses is correct | - | 5 |

| 1 | 2 | 3 | 4 | 5 |
|------------------------|------------------------|---------------------|---------------------|---|
| A, B and D are correct | A, C and D are correct | A and B are correct | C and D are correct | any other response or combination of responses is correct |

(41) Which is following/s is/are **correct** about meiosis

- (A) It occurs during pollen production in Anthophyta.
- (B) Occurs in haploid and diploid cells.
- (C) crossing over always occurs.
- (D) In metaphase 1, pairs of homologous chromosomes are arranged randomly on the metaphase plate.
- (E) At the end of telophase I, a cleavage furrow is formed in plant cells.

(42) Which of the following classes includes animals that exhibit internal fertilization as well as external fertilization

- (A) Osteichthyes (B) Amphibia (C) Reptilia
- (D) Chondrichthyes (E) Aves

(43) The characteristics/features found in the tissues of the human respiratory system

- (A) Several layers of disc-shaped cells
- (B) A single layer of dice-shaped cells
- (C) A single layer of cells with different heights
- (D) A matrix containing chondroitin sulfate
- (E) A single layer of brick-shaped cells

(44) The **correct** statement/s about statolith hypothesis

- (A) A type of specialized plastid found in all terrestrial plants.
- (B) Accumulation of statolith at the upper region of the root cap cells
- (C) Ca^+ redistribution and lateral transportation of auxins occurs within the root.
- (D) Ca^+ and auxin accumulate on the lower side of the root elongation zone.
- (E) Stimulation of root cell elongation by high auxin concentration

(45) Select the **correct** statement/s about a sarcomere and its function.

- (A) During muscle contraction, the myosin filaments of the sarcomere pull the actin filaments towards the center.
- (B) The binding sites on actin filaments are exposed by the action of calcium ions.
- (C) The dark area of a sarcomere contains only myosin filaments.
- (D) During muscle contraction, the length of the dark region of the sarcomere decreases.
- (E) During muscle contraction, the sarcomere shortens due to the contraction of the actin filaments in the sarcomere.

(46) In a non-evolving population

- (A) Mutations do not occur.
- (B) Selective mating should occur.
- (C) There should be no immigration or emigration.
- (D) Natural selection does not occur.
- (E) Small population should be present

(47) Select the **correct** relationship/s regarding the Mendelian characteristics of humans.

- (A) Presence of Widow's peak is a dominant trait.
- (B) A bent thumb is a dominant trait.
- (C) The ability to roll the tongue is a dominant trait.
- (D) Attached earlobes is a recessive trait.
- (E) Not having dimples is a dominant trait.

(48) Select the acceptable statement/s regarding antibiotics.

- (A) Antibiotics can be used against any microorganism that is pathogenic to humans.
- (B) Penicillin is an antibiotic that inhibits DNA synthesis.
- (C) Many antibiotics are produced by microbial fermentation.
- (D) Daptomycin destroys bacteria by disrupting their plasma membranes.
- (E) Antibiotics also cause some damage to host cells.

(49) Select the microorganisms that can be used for enzyme production

- (A) *Saccharomyces cerevisiae*
- (B) *Aspergillus oryzae*
- (C) *Streptomyces aureofaciens*
- (D) *Bacillus subtilis*
- (E) *Pseudomonas* sp

(50) Select the Birth control methods that prevent unwanted pregnancies by thickening the cervical mucus in women.

- (A) Use of oral contraceptive pills
- (B) Depo Provera vaccine
- (C) Vasectomy surgery.
- (D) Use of IUD (IUD)
- (E) Fallopian tube surgery.

