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Biology

II

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Two hours

(4) Meiosis II differs from mitosis because in Meiosis II,

- (1) the presence of chiasmata between the chromosome pairs where synapse occurred.
- (2) produce two chromatids by duplication of each chromosome in metaphase II.
- (3) Pair of chromatids of a chromosome is genetically dissimilar.
- (4) Chromatid pairs that separate are not genetically identical
- (5) homologous chromosome pairs separate from each other.

- (5) Which of the following compound is required in addition to both glucose and the enzymes used to initiate the actions of glycolysis?
- | | |
|-------------------------|----------------------------|
| (1) Acetyl Co- A enzyme | (2) Reduced NAD^+ |
| (3) Piruvate | (4) 3- PGA |
| (5) ATP | |
- (6) The question given is based on the following plant cells.
- | | |
|----------------------------|-------------------------|
| (a) Guard cells | (b) Bundle sheath cells |
| (c) Normal epidermal cells | (d) Mesophyll cells |
| (e) Collenchyma cells | |
- Among the above cells, which bear chloroplasts in C_4 plant cells.
- | | | |
|-------------|----------------|-------------|
| (1) a, b, d | (2) a, d, e | (3) b, c, e |
| (4) b, d, e | (5) a, c, d, e | |
- (7) The true statement about the classification of organisms from the following is,
- (1) the classification of the three domain shows the divergence of archaea from other organisms.
 - (2) bacteria and archaebacteria belong to two kingdoms and show prokaryotic cellular organization.
 - (3) a hierarchy of taxa consists of kingdom at the top and species at the bottom.
 - (4) viruses do not belong to any kingdom because they do not have organized nuclei.
 - (5) the number of common features found in a genus is higher than the number of common features found in a spezcies.
- (8) The **incorrect** statement refers to a unicellular protist that does not have flagella is,
- | | |
|--------------------------------------|--------------------------|
| (1) may be sensitive to streptomycin | (2) can bear cell walls |
| (3) may have a pellicle | (4) may be heterotrophic |
| (5) may be photosynthetic | |
- (9) Which of the following plant is closest to *Marchantia* evolutionarily?
- | | | |
|------------------------|------------------------|----------------------|
| (1) <i>Selaginella</i> | (2) <i>Gnetum</i> | (3) <i>Pogonatum</i> |
| (4) <i>Lycopodium</i> | (5) <i>Nephrolepis</i> | |
- (10) Select the correct statement about the kingdom Plantae.
- (1) All homosporous plants lack vascular tissue.
 - (2) All non -flowering plants have no seeds.
 - (3) All plants with vascular tissue do not have dominant gametophytes.
 - (4) All plants with photosynthetic gametophytes lack vascular tissue.
 - (5) All heterosporous plants do not require external water for fertilization.
- (11) Following are some structures seen among animals
Protonephridia, Ctenoid scales, Cnidocytes, Mantle.
Organisms showing each of the above structures respectively are,
- | | |
|--|--|
| (1) <i>Taenia</i> , skate, <i>Fasciola</i> , hook worm | (2) <i>Fasciola</i> , Shark, jelly fish, earthworm |
| (3) Sea cucumber, <i>Thilapia</i> , <i>Obelia</i> , Slug | (4) <i>Planaria</i> , Carp, <i>Hydra</i> , Snail |
| (5) Sea anemone, Tuna, <i>Teania</i> , oyster | |

- (12) Select the true statement regarding the root apical meristem.
- (1) The cells at the root apex belong to the elongation zone.
 - (2) Composed of parenchyma cells.
 - (3) The root cap is formed by the undifferentiated exogenous cells.
 - (4) Does the primary growth as well as secondary growth of root.
 - (5) Spend a dormant period in the presence of adverse environmental factors.
- (13) Select the correct statement about ground tissue system.
- (1) Sclerenchyma cells have suberized walls.
 - (2) Collenchyma cells act as supportive tissues in non woody plants.
 - (3) Parenchyma cells have thick, flexible cell walls.
 - (4) Perform storage, long distance transport and photosynthesis.
 - (5) Consists of cortex, pith and pericycle.
- (14) Which of the following is **false** regarding the functioning of stomata in plant leaves?
- (1) ATP provides energy for the transport of K^+ ions.
 - (2) Abscissic acid reaches the guard cells and stimulates stomatal closure.
 - (3) Less elastic outer wall of the guard cells contribute to the opening of stomata
 - (4) When the transpiration is high the stomata of plant leaves close.
 - (5) The cellulose thickening pattern of the guards cells helps the opening and closing mechanism of stomata
- (15) Which of the following statement is correct when comparing *Cycas* ovule and angiosperm ovule?
- (1) Both ovules contain archegonia and pollen chambers.
 - (2) An ovule of an angiosperm has only one female gametophyte while a *Cycas* ovule has several female gametophytes.
 - (3) An ovule of an angiosperm has only one egg cell while a *Cycas* ovule has several egg cells.
 - (4) *Cycas* bears a diploid endosperm while an angiosperm bears a triploid endosperm.
 - (5) *Cycas* ovule has a micropyle while angiosperm ovul does not has a micropyle.
- (16) Which of the following statement is correct regarding the translocation of food in the phloem?
- (1) Sucrose transport occurs from the source to sink in the sieve tubes of phloem.
 - (2) Sucrose is the only organic substance transported in the phloem.
 - (3) The process of phloem unloading consumes metabolic energy.
 - (4) As sieve tube elements does not contain nuclei they become non living cells and contribute to the phloem translocation.
 - (5) The flow of phloem sap occurs as a bulk flow under a negative pressure.
- (17) In experiments to measure the rate of transpiration of a plant shoot if the shoot is not cut under water the test is likely to fail. This is due to which of the following;
When shoot is cut in air,
- (1) transportation cannot occur in the absence of a continuous water column in the system
 - (2) transportation is limited due to closure of stomata
 - (3) air enters the xylem vessels and break the cohesive forces of the water column.
 - (4) the amount of water reduced by transpiration cannot be measured.
 - (5) the phloem sap will block the xylem vessels.

- (18) Which statement is correct about bone and cartilage tissue?
- (1) Chondrocytes and myosin fibres are embedded in the matrix of cartilage.
 - (2) Mature bone cells that maintain bone tissue are osteoblasts.
 - (3) Chondrocytes in the cartilage tissue secretes inorganic salts.
 - (4) The intervetebral disc contains bone tissue.
 - (5) Osteocytes are enclosed within lacunae in an osteon.
- (19) Select the statement that correctly describes the functions of the parts of the human digestive system.
- (1) Chief cells in stomach secrete H^+ and Cl^-
 - (2) Most part of the food digestion takes place in the jejunum
 - (3) Intestinal proteases catalyze the conversion of small peptides into amino acids.
 - (4) Appendix is important for fermentation of non-digestible substances by microorganisms.
 - (5) The colon stores feces until they are eliminated.
- (20) Below given are some of the events that occurred during a complete heart beat.
- (a) At complete cardiac diastole the superior and inferior venacava carry deoxygenated blood to the right atrium.
 - (b) Atrial systole lasts for 0.3s.
 - (c) In ventricular systole the pressure in the right ventricle is higher than the pressure in the pulmonary artery.
 - (d) During complete cardiac diastole atrioventricular valves are open.
 - (e) During artial systole the pressure in atria is less than the pressure in ventricles.

Which of the about responses are correct regarding complete heart beat.

- (1) a, d and e only (2) c, d and e only (3) a, c and d only
(4) a and c only (5) a and d only
- (21) Select the response which mention the parts of the central nervous system that are responsible for regulation of respiration and proper handling of it.
- (1) Cerebellum, Pons Varolii (2) Medulla oblongata, Corpus callosum
(3) Pons Varolii, Medulla oblongata (4) Pituitary gland, Pons Varolii
(5) Medulla oblongata, Pons Varolii
- (22) Which of the following respiratory capacities are important for finding the functional residual capacity in a person?
- p** - Tidal volume **r** - Expiratory reserve volume
q- Inspiratory reserve volume **s** - Residual volume
- (1) p and q only (2) q and r only (3) r and s only
(4) p, r and s only (5) p, q and s only
- (23) Select the correct statement about antigens.
- (1) Proteins secreted by plasma cells.
(2) Proteins and phospholipids act as antigens.
(3) A single antigen has a single epitope
(4) When antigen binds to the specific antigenic receptors on T or B lymphocytes, the lymphocytes are activated.
(5) The shape of the antigen is similar to that of antigenic receptors on B lymphocytes.

- (24) Select the correct statement about selective reabsorption and secretion in the human nephron.
- (1) Energy is always expended for selective reabsorption.
 - (2) Most of the water is reabsorbed in the distal convoluted tubule.
 - (3) H^+ secretion occurs only in the distal convoluted tubule.
 - (4) Water is reabsorbed passively in the ascending limb.
 - (5) NaCl is reabsorbed both actively and passively in the ascending limb.
- (25) The correct combination of the part of the human brain and its function is,
- | | |
|------------------|--|
| (A) Thalamus | (E) Regulates thirst and water balance. |
| (B) Hypothalamus | (F) Helps in motor skills and learning |
| (C) Pons Varolii | (G) Selective disclosure of sensitive information. |
| (D) Cerebellum | (H) Coordinates large scale body movements |
- (1) A, F (2) D, G (3) B, F (4) B, E (5) C, H
- (26) The **false** statement about the human autonomic nervous system is,
- (1) it consists of neurons that carry impulses to control the processes of the glands.
 - (2) controls involuntary activities.
 - (3) parasympathetic nerves exit the base of the brain and the spinal cord.
 - (4) same neurotransmitter enables the two systems, sympathetic and parasympathetic to bring about two opposite effects in different organs.
 - (5) stimulation of the sympathetic system promotes vaginal contractions.
- (27) Below are some statements about human sensory structures.
- A - Epithelial cells are specialized as taste receptor cells and organized as taste buds.
 B - Olfactory sensory cells are located in the epithelial cells of the nasal cavity lining.
 C - Pacinian cells are found in the deep skin as the pressure receptors.
 D - Human sensory receptors are always connected to the nervous system.
- Which of the above statements is correct?
- (1) A and B only (2) B and C only (3) A, B and C only
 (4) A, C and D only (5) A, B, C and D only
- (28) The correct statement about the hormonal control of the human female reproductive cycle is,
- (1) Progesterone secreted by growing follicles maintains the proliferative phase of the uterus.
 - (2) Due to FSH and high LH values the secondary oocyte is released from the ovary.
 - (3) During the luteal phase of the ovarian cycle estradiol secreted by the corpus luteum acts on the pituitary to maintain high levels of FSH secretion. .
 - (4) The high gonadotropin levels at the end of luteal phase of the ovarian cycle promotes generation of the corpus luteum.
 - (5) If implantation of an embryo does not occur during menstrual flow phase, the corpus luteum degenerates and ovarian hormones increase.

(29) Below are the changes that occur in each trimester of a embryo/ fetus and the trimesters.

A - Assumes distinctively human features.

P - First trimester

B - The heart begins to beat

Q - Second trimester

C - Most of the organ systems become fully functional

R - Third trimester

D - Mother may feel the fetal movements.

E - The fetus grows to about 50 cm in length

The different stages of the fetus and the trimester are correctly matched,

(1) AR, BP, CQ, DP, ER

(2) AQ, BP, CR, DQ, ER

(3) AR, BQ, CQ, DR, EP

(4) AR, BQ, CR, DP, EQ

(5) AP, BP, CQ, DQ, ER

(30) Which of the following statement is correct regarding the human lower limb?

(1) Lower end of femur articulates with fibula and patella to form the knee joint

(2) Lateral tibia and medial fibula forms the calf.

(3) Lower ends of tibia and fibula articulate with a tarsal bone to form the ankle joint.

(4) Curve running heel to toe is called the transverse arch

(5) Only rotational movements can be performed at the hip joint.

(31) A population in Hardy- Weinberg equilibrium is 64% homozygous dominant for a particular trait. What is the frequency of the recessive allele in this population?

(1) 0.1

(2) 0.2

(3) 0.36

(4) 0.64

(5) 0.8

(32) Select the most appropriate response by studying the following pair of statements.

A :- Cystic fibrosis is a disease condition caused by the formation of thick sticky mucous than its normal nature.

B :- The condition is caused by the gene mutation which make a defect in the transmembrane chloride channels to secrete excess chloride.

(1) Both statements A and B are true.

(2) A is true and B is false

(3) A is false and B is true

(4) Both statements A and B are true and B explains A.

(5) Both statements A and B are true and B does not explain A.

(33) A characteristic of the genetic code is,

(1) An overlapping code

(2) There are spaces between words in the code

(3) Consists of 61 codons

(4) Stored in a gene as three letter word

(5) Change from organism to organism

(34) This question is based on the diagram below.



Synthesis of proteins by the above structure.

(1) indicates the termination.

(2) shows elongation in translation.

(3) shows initiation in translation.

(4) shows a polyribosome

(5) shows a structure of a ribosome

- (35) Which is the correct response regarding ecological pyramids?
- (1) All ecosystems have the same number pyramids
 - (2) The highest level of an ecological pyramid is at the top of the food chain.
 - (3) The top level of an energy pyramid has the most energy.
 - (4) The number of individuals in a number pyramid always decreases from lower to higher trophic levels.
 - (5) The biomass pyramid is always inverted.

- (36) Following are the characteristics of several biomes.

- Scattered trees in a tall grass cover.
- The dominant trees are mostly deciduous.
- Composed of dwarf forests and shrubs.
- Includes different types of grasses and forbs.

Select the response that states the biomes that have the above characteristics respectively.

- (1) Tropical forests, chaparral, desert, savanna
 - (2) Savanna, chaparral, tropical dry forests, tundra
 - (3) Savanna, temperate broadleaf forests, chaparral, tundra
 - (4) Northern coniferous forests, chaparral, tropical rain forests, tundra
 - (5) Savanna, chaparral, tundra, Northern coniferous forests,
- (37) Savanna grasslands in Sri Lanka are found in which of the following climatic zones.
- (1) Arid zone and dry zone
 - (2) Arid zone and intermediate zone
 - (3) Dry zone and intermediate zone
 - (4) Only in dry zone
 - (5) Only in arid zone

- (38) This question is based on the following scenario

- (A) 1. Microorganisms are small in size and have a high surface area/ volume ratio.
2. The metabolic rate of microbes increases and the average generation time is relatively reduced.
- (B) 1. Bacteria reproduce asexually by binary fission and rarely exhibit fragmentation and budding.
2. At sometimes bacteria of two strains share a portion of genetic material through the process of conjugation.
- (C) 1. Anaerobic condition of compost heaps.
2. Increase the activity of methanogenic bacteria
- (D) 1. Mycoplasma require high amount of organic growth factors.
2. Mycoplasma are pleomorphic, vary in shape from spherical to filamentous.
- (E) 1. Use of bio fertilizers in cropping systems.
2. Increase the bioavailability of N and P in soil.

The choice that **contains an increase in the first affects the increase in the second** is,

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

- (39) An example of a virus that contains more than one form of symmetry is,
- (1) Tobacco Mosaic virus
 - (2) Adeno virus
 - (3) Herpes simplex virus
 - (4) Rabies virus
 - (5) Bacteriophage
- (40) Following are some of the steps involved in industrial waste water treatment.
- (a) Removal of sand
 - (b) Removal of oil and grease
 - (c) Sludge collected and removed
 - (d) Large floating materials are screened out
 - (e) Solid matter settles out in sedimentation tanks.

The choice that contains the correct sequential order is,

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

❖ 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 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 response is correct.....(5)

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

- (41) Below shows few structures found in eukaryotic cells.
 The structures found in both nucleus and mitochondrion is / are
- (A) Double membranes
 - (B) DNA
 - (C) 70s ribosomes
 - (D) Matrix with protein filaments
 - (E) Membranes perforated pores.
- (42) Which of the following statement/s regarding the theory of evolution is/ are described by the Darwin Wallace theory?
- (A) The parts of the body that are used extensively become larger and stronger.
 - (B) Inheritance of acquired characteristics occurs from generation to generation
 - (C) Variations are shown by the individuals in a population.
 - (D) Two phenomena can be observed from the environment.
 - (E) Resistance against disease is an advantageous feature.
- (43) Which of the following statement/ s is / are true regarding the plant responses shown for the different stimuli?
- (A) Positive phototropism of plant shoots strengthen the photosynthes.
 - (B) The aggregation of statoliths of some root cap cells triggers gravitropism.
 - (C) The changes in plant form due to mechanical disturbances is called thigmonasty.
 - (D) The directional growth of tendril towards support is called thigmotropism.
 - (E) The growth substance, auxin, controls the triple response in seedlings.

- (44) Which of the following statement/ s is / are true regarding the human lymphatic system?
- (A) The lymphatic system is closely connected with the blood circulatory system functionally.
 - (B) The force exerted by the contraction of the heart helps to move the lymph along the lymph vessels.
 - (C) The lost fluid from the blood capillaries is called lymph.
 - (D) It carries out immune responses.
 - (E) Lymph nodes are composed of connective tissues and platelets.
- (45) The correct statement/ s regarding the spermatogenesis is/are,
- (A) The time taken to produce mature sperm cells from spermatogonia is about seven weeks.
 - (B) Primary spermatocytes are present in the periphery of the seminiferous tubule.
 - (C) Spermatids have characteristic head, middle piece and a tail.
 - (D) Spermatogonial stem cells divides twice mitotically to produce primary spermatocytes.
 - (E) Secondary spermatocytes are haploid cells.
- (46) The statement/ statements regarding the disorders and abnormalities associated with human skeletal system is / are,
- (A) Osteoarthritis is non-inflammatory disease, associated with the reduction of bone density.
 - (B) Slipped disc is protruding of the the outer portion of the intervertebral disc through the inner ring.
 - (C) A risk factor for osteoarthritis can be obesity.
 - (D) Environmental factors also affect on osteoporosis.
 - (E) Osteoporosis condition leads to immobility.
- (47) This prokaryotic cell contain/s
- (A) Double stranded , circular, single DNA molecule.
 - (B) Double stranded , linear, several DNA molecules.
 - (C) Generation of supercoiled chromosomes in architecture of chromosomes.
 - (D) DNA- protein complex exist as euchromatin or heterochromatin.
 - (E) Presence of extra chromosomal elements called plasmids in cytoplasm.
- (48) The response/ responses which shows the correct sequence of organisms categorized according to the Red data book EX, CR, En and VU is/ are,
- (A) Giant tortoises, Vesak orchid, Butter cup, Mahamadu
 - (B) Dodo, Elephant, Marbled rock frog, Dusky striped jungle squirrel.
 - (C) Woolly mammoth, maha madu, Butter cup, Elephant
 - (D) Dodo, Marbled rock frog, Vesak orchid, Dusky striped jungle squirrel.
 - (E) *Crudia zeylanica*, Dusky striped jungle squirrel, Mahamadu, Giant tortoise.
- (49) Select the correct pair,
- | | |
|--|--|
| (A) <i>Chlorella</i> sp. - Single cell | (B) <i>Acetobacter</i> sp. - Vitamin B ₁₂ |
| (C) <i>Rhizopus</i> sp. - Lipase | (D) <i>Streptomyces griseus</i> - Streptomycin |
| (E) <i>Aspergillus niger</i> - Citric acid | |
- (50) The ingredients of a tissue culture medium are,
- | | | |
|----------------|--------------|---------------------|
| (A) Sucrose | (B) Glucose | (C) Inorganic salts |
| (D) Cytokinins | (E) Ethylene | |

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Three hours

Visakha Vidyalaya Colombo 05 – Advance Level Biology - 2023A/L – Grade 13 Third Term Test–2023 November *[See page two]*

Part A–Structured Essay
Answer **all** questions on **this paper itself**.
(Each question carries **100** marks)

1. (A) (i) State four characteristic features of organisms.

.....

.....

.....

.....

(ii) State three methods based on knowledge in biology for sustainable food production.

.....

.....

.....

(iii) (a) State the main property of water that causes a film of water on the surface to provide habitat for small organisms.

.....

(b) Name the macronutrients that make up 4% of the mass of organisms.

.....

(iv) The two ends of the phospholipid molecule show different behavior. Explain.

.....

.....

(v) (a) State two structural differences in the two groups of nitrogenous bases found in nucleic acids.

.....

.....

(b) State the main function of the smallest type of RNA contained in eukaryotic cells.

.....

(B) (i) (a) Name the groups of invertebrates that appeared during the late Proterozoic eon.

.....

(b) State the era which includes the present time belongs to Phanerozoic eon.

.....

(ii) (a) What is the natural taxon used in classification?

.....

(b) Define the phylogenetic species concept.

.....

- (iii) What are the criteria used for the five kingdom classification system of the scientist Robert H Whittaker.

.....

.....

.....

- (iv) (a) Name a genus with each of the following structures.

Structure

Genus

- Basidiospore
- Conidia

- (b) Name the main storage food of yeast.

.....

- (v) Name a phylum of seedless plants that has the most recent common ancestor with seed plants and name a plant genus in that phylum.

- Phylum -
- Genus -

- (vi) Write the structures of angiosperms corresponding to the structures of *Cycas* given below.

Structure of *Cycas*

Structure of angiosperms

- Microsporophyll
- Female gametophyte

- (C) (i) Name the kingdom of organisms which is considered as an artificial group containing polyphyletic organisms.

.....

- (ii) State an external feature unique to mammals.

.....

- (iii) Complete the given dichotomous key using the appropriate numbers and organisms.

Hydra, Hook worm, Earthworm, Sand dollar, *Chiton*, Frog

1. Have penta radial symmetry.
Do not have penta radial symmetry.
2. Have tentacles.
Do not have tentacles.
3. Have a worm like body.
Do not have a worm like body.
4. Have a clitellum.
Do not have a clitellum.
5. Have an external shell.
Do not have an external shell.

2. (A) (i) State an important physiological feature of meristematic cells.

.....

(ii) Name two other types of plant cells/tissues that perform supportive function in addition to collenchyma cells.

.....

.....

(iii) State two adaptations of a xylem vessel element to transport water and minerals.

.....

.....

(iv) State two major differences between phloem translocation and upward movement of water.

.....

.....

(v) State two requirements to occur guttation.

.....

.....

(vi) Name two trace elements that form chlorosis in young leaves.

.....

.....

(B) (i) (a) State the exact location of the pyloric sphincter in human body.

.....

(b) Write an example of an essential amino acid for human.

.....

(ii) (a) What is an open blood circulatory system?

.....

.....

(b) State the reason for the evolution of respiratory pigments in complex animals.

.....

.....

(iii) (a) Name the type of histamine secreting cell found in connective tissue of human.

.....

(b) State roles of histamine in inflammatory responses.

.....

.....

(iv) (a) Name the largest and more potent phagocytic cells found in the human body.

.....

(b) Name the type of lymphocyte that contributes to internal defenses in innate immunity and state its main function.

Type of cell

Main function

(c) What are complement proteins ?

.....

.....

(v) (a) Write two main characteristics of adaptive immunity.

.....

.....

(b) State the difference in functioning of T cells in autoimmune diseases, type I diabetes mellitus and multiple sclerosis.

.....

.....

(vi) (a) Name the enzyme produced by the kidneys in the process of regulating blood pressure.

.....

(b) State one function of the hormone produced by the adrenal glands in lowering blood pressure.

.....

(C) (i) What are the main parts of the human central nervous system ?

.....

.....

(ii) Write two structural adaptations that the human central nervous system has to protect itself from physical damages.

.....

.....

(iii) The human cerebral cortex is made up of which part of neurons.

.....

(iv) What is the action of the axon membrane is called, to prevent the reverse conduction of an impulse ?

.....

(v) State two methods in which the signal at the presynaptic terminal is terminated after passing to the post synaptic cell.

.....

.....

(vi) (a) What change occurs in the human eye lens to focus a near object on the retina.

.....

(b) Write the path taken by the light rays coming from a distant object as it is refracted by the lens and travels to the brain as a nerve impulse.

.....

.....

(c) Apart from the auditory receptors found in the human inner ear, name the locations of the other special receptors and state the body movements identified by them.

Location

Body movement

.....

.....

3. (A) (i) Name an organ in the human body where isolated endocrine cells can be found in addition to endocrine glands.

.....

(ii) (a) Which human anterior pituitary hormone has trophic and non-trophic effects?

.....

(b) What is target site of the hormone stated in (ii) (a) ?

.....

(iii)(a) Name the hormone secreted by the parathyroid gland.

.....

(b) What specific cell type does that hormone act on ?

.....

(iv) (a) What is lactation?

.....

(b) What pituitary hormone affects the human lactation?

.....

(v) (a) What is the specific stimulus that required for the human secondary oocyte to become a mature ovum?

.....

(b) Where does the fertilization of the human secondary ovum take place?

.....

(c) State separately the fetal structures and the maternal structures that contribute to the formation of the human placenta.

Fetal structure

Maternal structure

(vi) What is the negative feedback mechanism by Leydig cells that regulates the production of sex hormones in males?

.....

(vii) What is the main structural adaptation in the human testes to maintain the temperature below the body temperature?

.....

(B) The diagram given below is a structure belonging to the human skeleton.



Figure 1

(i) (a) Identify the above figure 1.

.....

(b) Name the parts *a* and *b*.

a

b

(ii) (a) Which bone articulates the above (i)(a) structure with the axial skeleton

.....

(b) What type of joint does the human upper limb form when it articulates with the bone in the figure 1 above. State the type of movement that joint exhibits through a wide range.

Type of joint

Type of movement

(iii) In which direction do the protein filaments of the sarcomere move during contraction?

.....

(iv) (a) Which motor protein helps in muscle contraction?

.....

(b) State the type of protein attaches with the Z line.

.....

(v) What is the role of ATP in skeletal muscle contraction?

.....

.....

.....

.....

.....

.....

.....

A

B

C

4. (A) (i) What is meant by a multifactorial cross ?

.....

(ii) While *Drosophila*'s grey body (G) is dominant to black body (g), normal wing (N) is dominant to vestigial (n). When the F₁ obtained by the cross between true breeding grey body normal wing flies and true breeding black body vestigial flies were test crossed and the progeny obtained had high percentages of grey body normal wing (GgNn), black body vestigial (ggnn) flies and less percentages of black body normal wing (ggNn) grey body vestigial (Ggnn) flies.

(a) Inheritance of characteristics like above is called by which name ?

.....

(b) State the reason for gaining the progeny as above.

.....

(c) Write the genotype of the progeny of F₁ and draw how the alleles are located on the chromosome.

(iii) (a) State a function of helicase in DNA replication.

.....

(b) State two facts in which transcription differs from replication.

.....

.....

(iv) (a) Name the segment of DNA that is important to insert the useful gene in the genetic modification of the Ti plasmid of *Agrobacterium*.

.....

(b) State the basic steps in a sequence to form a recombinant DNA (rDNA) molecule.

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•

(v) State two major fields of applications of DNA sequencing.

•

•

(B) (i) (a) Name two sources of abiotic resources in an environment.

.....
.....

(b) What makes the shortest food chains environmentally efficient ?

.....
.....

(c) Define 'community'.

.....
.....

(ii)(a) Name the largest biome on earth.

.....

(b) Write two adaptations of roots of chaparral plants.

.....
.....

(c) State a reason why temperate broad leaf forests are disturbed.

.....

(iii) (a) Name the main forest type found in the dry zone of Sri Lanka.

.....

(b) Name a naturally occurring plant in above (iii)(a).

.....

(iv) (a) Write the areas where salt marshes are spread in Sri Lanka.

.....

(b) Write three climatic features of the above region stated in (iv)(a).

.....
.....
.....

(C) (i) State the three levels that explains biodiversity. .

.....
.....
.....

(ii) (a) What is a biodiversity hotspot ?

.....
.....

(b) State the main objective of the biodiversity conservation process.

.....

(iii)(a) Write two main types of gases contribute to acid rain.

.....
.....

(b) Name two wetlands declared as Ramsar wetlands in Sri Lanka.

.....
.....

(c) What is the reason for designing the Montreal Protocol ?

.....
.....

(iv) State how the filaria parasite enters the human body by a female *Culex quinquefasciatus* mosquito.

.....

(vi) Name the source of obtaining embryonic stem cells.

.....

* *

සියලු ම හිමිකම් ඇවිරිණි / All Rights Reserved]



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Third Term Test, 2023, November

ජීව විද්‍යාව II
Biology II

13 ශ්‍රේණිය (A/L) 2023
Grade -13 (A/L) 2023

09

E

II

Part B - Essay

Answer **four** questions only.

Give clear labelled diagrams where necessary.

Each question carries **150** marks.

5. (a) Briefly describe the basic chemical nature and the structural levels of proteins.
(b) Briefly explain how to design a laboratory experiment to determine the rate of photosynthesis of an aquatic plant at different light intensities using the Audus apparatus.
6. (a) Briefly explain what photomorphogenesis is ?
(b) Name the major plant growth regulators and briefly describe their functions.
7. (a) Describe the morphological structure of the liver and the histology of a liver lobule.
(b) Briefly state the functions of liver in relation to digestion.
8. (a) Briefly describe the basic structure of human skin.
(b) Explain the homeostatic control of human body temperature.
9. (a) Briefly explain genetic modification under plant breeding.
(b) Describe the effects of food spoilage on human health.
10. Write short notes on the following.
 - (a) Phylum - Zygomycota
 - (b) Applications of genetically modified organisms (GMO) in industries.
 - (c) Life cycle of *Aedes* mosquito.