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Biology I

13 ශ්‍රේණිය (A/L) 2024
Grade -13 (A/L) 2024

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Two hours

Instructions :

- * Answer all questions.
- * Write your **Index Number** in the space provided in the answer sheet.
- * Instructions are given on the back of the answer sheet. Follow those carefully.
- * In each of the questions 1 to 50, pick one of the alternatives from (1), (2), (3), (4), (5) which is correct or **most appropriate** and **mark your response on the answer sheet with a cross (x)** on the number of the correct option in accordance with the instructions given on the back of the answer sheet

1. Which of the following polysaccharides contains galacturonic acid as the monomer?
(1) Chitin (2) Pectin (3) Inuline (4) Glycogen (5) Hemicellulose
2. Select the most correct statement regarding the microscopes.
(1) The resolution is limited due to the magnification of a microscope.
(2) Transmission electron microscope is the most suitable for studying internal structures of cells.
(3) In a microscope, resolution power is directly proportional to the wavelength.
(4) The simple microscope is commonly used in school laboratories and medical laboratories as a diagnostic tool.
(5) Images obtained by the electron microscope can be observed with the actual colours of the object.
3. Select the correct response that correctly matches the subcellular component and its function.
(1) Smooth endoplasmic reticulum – Manufacturing cellulose
(2) Glyoxysomes – Photorespiration in plants
(3) Flagella and cillia – Cytoplasmic streaming
(4) Cytoskeleton – Moving fluid over the surface of the tissue
(5) Lysosomes – Transport residue materials out of cell
4. This question is based on following statements.
(A) Formation of synaptonemal complex.
(B) The homologous chromosome pairs move towards the metaphase plate.
(C) One chromosome of each pair arrange facing each pole.
(D) Chromosomes decondense into chromatin.

Which events are taken place in the prophase of the reduction division?

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

5. Select the correct statement regarding the photosystem II.

- 1) The chlorophyll a molecule in the reaction center is P 700.
- 2) Only ATP is produced here.
- 3) Oxygen gas is released near this.
- 4) NADP^+ is reduced into NADPH.
- 5) Cyclic electron flow takes place here.

6. Following are four events in aerobic respiration of a glucose molecule.

- A) Produce water
- B) Substrate level phosphorylation
- C) Four carbon dioxide molecules released by decarboxylation
- D) Oxidation of NADH and FADH_2 molecules

The correct sequence of events above is,

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

7. Which of the following statements is true about the evolution of biodiversity?

- (1) DNA acted as the first genes and enzymes.
- (2) Ancestors of arthropods originated 700 million years ago.
- (3) Many present day animal phyla appeared in the late Palaeozoic era.
- (4) After the first eukaryotes appeared, a great range of unicellular forms evolved.
- (5) Atmospheric conditions of early earth, facilitated the biotic synthesis of small organic molecules.

8. What is the matching combination of the work performed by the scientists in the classification of organisms?

- (1) Linnaeus - Introduced Protista, Plant and Animal kingdoms
- (2) Theophrastus - Classified animals according to body form
- (3) Carl Woese - Introduced the five kingdom classification
- (4) Haeckel - Introduced the taxon phylum
- (5) Whittaker - Forwarded the three domain system of classification

9. Consider the following statements.

- A - Possesses a reduced independent gametophyte.
- B - Female gametophyte bears the sporophyte.
- C - Retaining the megasporangium within the parent sporophyte
- D - Reproductive organs live underground in some species.

According to the above characteristics, the response that plant phyla arranged in the correct order is,

- (1) Bryophyta, Pterophyta, Anthophyta, Lycophyta
- (2) Pterophyta, Bryophyta, Cycadophyta, Lycophyta
- (3) Pterophyta, Bryophyta, Lycophyta, Cycadophyta
- (4) Bryophyta, Pterophyta, Anthophyta, Lycophyta
- (5) Lycophyta, Bryophyta, Cycadophyta, Pterophyta

10. Select the correct statement regarding the primary structure of a dicot stem.

- (1) Inner to pericycle, vascular tissue is seen as a central solid core.
- (2) Ground tissue is not differentiated into cortex and pith.
- (3) Innermost layer of the cortex is the endodermis.
- (4) Xylem and phloem are arranged alternately in a ring surrounding the central core made up of parenchyma cells.
- (5) Vascular bundle contains primary phloem towards the cortex and primary xylem towards the pith.

[See page three]

What is the action of cork cambium in a plant?

- (1) Aids in plant wound healing.
- (2) Forming a tough outer covering with thickened cell walls.
- (3) Increase the length of shoot and root due to the production of new cells.
- (4) Occurrence of hardness and strength of the plant wood.
- (5) Connects secondary xylem and secondary phloem by parenchyma cells.

12. Select the correct statement about the concept of water potential.

- (1) As solutes are added to pure water, its negative value of ψ_s decreases.
- (2) Free water molecules move from a lower to a higher water potential.
- (3) Increasing solute concentration has a positive effect on water potential.
- (4) Due to the increase of turgor pressure, the water potential increases of the cell.
- (5) Xylem vessels usually has ψ_p of more than - 2 MPa.

13. This question is based on the following clauses.

- A - Decrease in water potential in sieve tube elements.
- B - Loading of sugar into sieve tubes.
- C - Build up of positive pressure in the sieve tube.
- D - Unloading of phloem.
- E - Entry of water from xylem to sieve tubes by osmosis.

Select the answer given in order of the steps in phloem translocation.

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

14. Deficiency of which of the following elements cause chlorosis in younger leaves?

- | | | |
|---------------|---------------|---------------|
| (1) Mn and Fe | (2) Mo and Ni | (3) Mg and Ca |
| (4) N and Mg | (5) S and Cu | |

15. Select the option that correctly represents the component contained in saliva and its function.

- | | |
|------------------------------|---|
| (1) Salivary amylase | - Converts polysaccharides into monosaccharides. |
| (2) Mucus | - Prevent tooth decay by neutralizing acid. |
| (3) Water | - Aids in taste reception. |
| (4) Antimicrobial substances | - Lubrication of food which makes it easier for swallowing. |
| (5) Buffers | - Protect against bacteria that enter the mouth. |

16. Select the true statement about vitamins.

- (1) Cereals are a rich source of vitamin A.
- (2) Vitamins cannot be synthesized in human.
- (3) Vitamin D deficiency causes degeneration of the nervous system.
- (4) Lack of niacin causes anemia.
- (5) Vitamin C deficiency delays wound healing.

17. Which of the following statements about the structure and function of the human heart is correct?

- (1) The bicuspid valve is located between the right atrium and the ventricle.
- (2) It consists of long cylindrical muscle cells.
- (3) The duration of the atrial systole is 0.4 seconds.
- (4) Due to the stimulation of parasympathetic nervous system, the rate of heartbeat increases.
- (5) Heart ventricular repolarization is represented by the T wave in an electrocardiogram (ECG).

18. What is correct about the SA node of human heart?

- (1) It is situated in the wall of right atrium near to atrial septum.
- (2) It is stimulated by impulses from the pace maker of the heart.
- (3) The stimulus for heart beat initiates from it.
- (4) Purkinje fibers originates from it.
- (5) It is composed of nervous tissue.

[See page four]

19. Select the true statement about human blood.
- (1) The blood plasma always contains salts, water, fibers and soluble proteins.
 - (2) Individuals with Rh⁻ always have anti Rhesus antibodies.
 - (3) A person with blood group O has both types of agglutinin A and B.
 - (4) Carbon dioxide is transported through the blood by binding to the protein group of haemoglobin.
 - (5) Heparin stimulates the conversion of prothrombin into thrombin in blood clotting.
20. Select the option that correctly matches the respiratory structure and the relevant animal/animal group.
- (1) Internal gills - Marine annelids
 - (2) Skin - Salamander
 - (3) Book lungs - Cockroach
 - (4) Body surface - Rat snake
 - (5) Tracheal system - Spider
21. Which statement is true about the human respiratory system and its function?
- (1) The intercostal muscles, the diaphragm muscles and the muscles of the chest are important in the breathing process of a man at rest.
 - (2) A pair of respiratory control centers are located in the medulla oblongata and regulate the rhythm of respiration.
 - (3) Alveolar lining is composed of a single, flat, ciliated epithelial cell layer.
 - (4) Respiratory gas exchange takes place in the trachea and bronchus.
 - (5) The pharynx is a structure belonging only to the respiratory system.
22. Similarity between cell mediated immune responses and humoral immune responses is,
- (1) The production of cytotoxic T cells.
 - (2) Cytotoxic cells kill antigens directly.
 - (3) The production of memory cells.
 - (4) Act against fungi, viruses and parasites in host cells.
 - (5) Cells attack cells and kill.
23. Select the correct statement regarding excretion.
- (1) In human, urea is produced mainly in kidneys.
 - (2) The first nitrogenous excretory product in all animals is urea.
 - (3) Although the production of uric acid is advantageous, it takes more energy to produce uric acid from ammonia.
 - (4) The excretory end product of carbohydrate metabolism is lactic acid.
 - (5) Fatty acids and glycerol are made as excretory products by undergoing metabolism of fat in aerobic conditions.
24. Which of the following statements about the human brain is correct?
- (1) The pineal body derives from the embryonic midbrain.
 - (2) The surface of the cerebrum is made up of white matter.
 - (3) Three of the four brain ventricles are located in the forebrain and the other in the midbrain.
 - (4) Medulla oblongata extends from Pons Varolii and connects to the spinal cord at below.
 - (5) Brain stem consists of Pons Varolii, medulla oblongata and cerebellum.
25. Select the correct response regarding the action potential.
- (1) The membrane is more negative inside during hyperpolarization, due to opening of potassium channels, while closing of sodium channels.
 - (2) The membrane is more negative inside during repolarization, due to opening of Na⁺ channels and closing of K⁺ channels.
 - (3) Depolarization occurs due to Na⁺ outflow through the sodium channels, as a response to a stimulus.
 - (4) The action potential is the increase in membrane potential, due to polarization of the membrane, for a stimulus.
 - (5) Refractory period allows reverse conduction of an impulse.

Select the correct response regarding the human sensory receptors.

- (1) Organ of Corti is a touch receptor.
- (2) Pacinian corpuscles are pressure receptors.
- (3) Krause end bulbs are sensitive to high temperatures.
- (4) It is a structure specialized for recognizing any stimulus.
- (5) Due to continuous stimulation, all sensory receptors show decrease in functionality.

27. Which is not an important movement when lifting a weight with human upper limb?

- (1) Power grip.
- (2) Precision grip.
- (3) Supination.
- (4) Pronation.
- (5) Flexion and extension of lower arm.

28. Select the correct statement regarding the Mendel's dihybrid cross.

- (1) It is the cross between two homozygous organisms with contrasting traits for two specific characters.
- (2) The aim of it was to find the phenotype of the organism showing the recessive characters.
- (3) Ratio of having dominant phenotypes for both specific characteristics in F₂ generation is 3/16.
- (4) Ratio of having recessive phenotypes for both specific characteristics in F₂ generation is 1/16.
- (5) Based on the dihybrid crosses, Mendel put forwarded his first law.

29. Both alleles of a trait at heterozygous state contribute equally to the expression of phenotype. The non-Mendelian characteristic described in above statement is.

- (1) incomplete dominance
- (2) codominance
- (3) recessive epistasis
- (4) dominant epistasis
- (5) genetic linkage

30. A pair of enzymes used in DNA repair is,

- (1) DNA polymerase and DNA helicase.
- (2) Topoisomerase and DNA ligase.
- (3) Primase and DNA polymerase
- (4) DNA polymerase and DNA ligase.
- (5) Nuclease and DNA helicase

31. The correct statement regarding the mutations is,

- (1) insertion can be a silent mutation and leads to change the length of the gene.
- (2) a point mutation may cause premature termination of the protein synthesis.
- (3) insertion or deletion may result in shift in the reading frame.
- (4) while deleterious chromosome mutations are extremely rare, beneficial ones are very common.
- (5) inversion of a segment of chromosome does not alter the expression of the gene.

32. Select the correct statement regarding the prokaryotic and eukaryotic genes.

- (1) The DNA molecule in a chromosome is a gene.
- (2) A gene always have a pair of alleles.
- (3) Many genes are involved in controlling a phenotype.
- (4) All genes in eukaryotes are functional.
- (5) In eukaryotes, genes are present as clusters in a certain region of the chromosome one after the other.

33. Select the response which gives correct combination of climatic zone (A-D), type of forest (I-L) and plant form (P-S), according to the classification of ecosystems in Sri Lanka

- | The climatic zone | The type forest | Plant form |
|-----------------------|--|--------------|
| A - Arid zone | I - Tropical dry mixed evergreen forests | P - Keena |
| B - Intermediate zone | J - Tropical thorn forests | Q - Na |
| C - Dry zone | K - Tropical montane forests | R - Kaluwara |
| D - Wet zone | L - Tropical wet lowland forests | S - Heeressa |
-
- (1) A - I - R
 - (2) B - K - S
 - (3) A - J - Q
 - (4) D - K - P
 - (5) C - J - R

[See page six]

34. The response which gives the correct organism for the criterion of The Red Data Book published by International Union for Conservation of Nature (IUCN) is.
- (1) Extinct (EX) – Gaint tortoise in Seychelles (2) Endangered (EN) – Marbeled rock frog
(3) Vulnerable (VU) – Vesak orchids (4) Extinct in the wild (EW) – Dodo
(5) Critically endangered (CR) – Mahamadu
35. Select the responses that contains an effect of the ozone layer depletion
- (1) Leaching of some heavy metals in the soil
(2) Carbon storage capacity of plants and soils will be reduced in the long run.
(3) Reduce the composition of food web in the sea ecosystem.
(4) Loss the soil fertility.
(5) Increase the risk of diseases in respiratory system
36. Select the true statement regarding microorganisms.
- (1) The majority of microorganisms that associate with plants, animals and human are pathogenic.
(2) Only some viruses are harmful to organisms they attached to.
(3) Pathogenic bio aerosols cause opportunities for disease spreading.
(4) Most microorganisms are capable of inhabiting extreme unfavorable or lethal environmental conditions.
(5) All microorganisms live in aquatic environments are photosynthetic and the primary producers of these environments.
37. Which of the following is correct regarding the microorganisms and diseases.
- (1) Antibiotic therapy prevents making diarrhoea conditions and the colonization of *Salmonella enterica*.
(2) Invasiveness is the ability to produce biochemical substances that disrupt normal function of the cells .
(3) Endotoxins are thermostable lipopolysaccharides and a component of the cell walls of *Clostridium tetani*.
(4) Conjunctivitis and meningitis are spread by *Haemophilus influenzae* in man.
(5) Rifampin inhibits RNA synthesis while Daptomycin inhibits cell wall synthesis of bacteria.
38. Below gives few instances where microorganisms are used for various purposes.
- (A) *Chlorella* sp. and *Spirulina* sp. are used as food supplements.
(B) *Saccharomyces cerevisiae* and *Gluconobacter* are used for vinegar production.
(C) *Streptococcus* spp. and *Staphylococcus* spp. are used for cheese production.
(D) *Pseudomonas* sp. and *Propionibacterium* sp. are used for vitamin B₁₂ synthesis.
(E) *Rhizopus* spp. for the lipase and *Aspergillus niger* for the protease production are used.
- The correct combination of usage given in is,
- (1) A, B and C (2) A, B and D (3) A, B and E
(4) A, C and E (5) A, D and E
39. Select the true statement from the following, related to ornamental fish farming.
- (1) When maintaining a home aquarium, siphon off the debris along with 20 - 25% of the aquarium water monthly.
(2) Many infectious diseases could be avoided through better management practices such as maintaining an excessive stocking density of fish.
(3) The golden arrowana and tiger barb are fish species that have been conserved via ornamental fish production.
(4) Invasive ornamental fishes that are accidentally escaped to natural environment could affect only for native fish species.
(5) Trichodinosis and columnaris are bacterial infections of fish.

[See page seven.]

Below gives four organisms and four statements related to mosquito borne diseases.

Organism	Statement
P – <i>Aedes albopictus</i>	U) Used to control the dengue vectors.
Q – <i>Bacillus thuringiensis israelensis</i>	V) Breeds in polluted water.
R – <i>Wuchereria bancrofti</i>	W) Breeds in, natural breeding sites such as leaf axils , tree holes.
S- <i>Culex quinquefasciatus</i>	X) Chronic cough and wheezing which worsen at night are symptoms of the infection in man.

The correct combination of the above organism and statement is,

- (1) P – W , Q – U , R – V , S – X
- (2) P – V , Q – X , R – U , S – W
- (3) P – W , Q – U , R – X , S – V
- (4) P – W , Q – V , R – X , S – V
- (5) P – V , Q – X , R – W , S – U

- 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
 Is any other response of combination of responses is correct ... 5

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. Select the correct response/responses regarding the role of enzymes in regulating metabolic reactions.
 - (A) The interactions between substrate and active site may slightly change the shape of the active site.
 - (B) The presence of enzymes does not alter the nature or properties of the end products only in some reactions.
 - (C) When the temperature increases beyond the optimum temperature, the complementary nature of the active site will change.
 - (D) The enzyme molecules will be saturated after a particular concentration and there will not be any further increase in the rate of reaction.
 - (E) Drugs used against microbes are acting as irreversible inhibitors for enzymes.
42. The common characteristic feature/ features which is/are shown among the phyla of Arthropoda and Echinodermata,
 - (A) Triploblasticity.
 - (B) Being unisexual
 - (C) Having an endoskeleton.
 - (D) Having a tracheal system for respiration.
 - (E) Having open blood circulatory system.
43. In radial transportation of a plant, which part/parts belong to the symplastic pathway?
 - (A) Xylem vessel elements
 - (B) Extracellular spaces
 - (C) Plasmodesmata
 - (D) Cytosol
 - (E) Cell wall
44. Which of the following statement/statements about human hormones is/are correct?
 - (A) Thymosin regulates development and maturation of T lymphocytes.
 - (B) Both ADH and aldosterone are important in reabsorption of water from the distal convoluted tubule of the nephron.
 - (C) Prolactin is important in milk ejection.
 - (D) Both glucagon and cortisol increase blood glucose level.
 - (E) Parathyroid hormone decreases the calcium level in blood.

[See page eight

45. Select the correct statement/statements from the following about human pregnancy.
- (A) The presence of hCG in urine confirms pregnancy.
 - (B) At the end of the first trimester of pregnancy, the fetus is about 30 cm in length.
 - (C) Human pregnancy period is usually 38 weeks from fertilization.
 - (D) hCG hormone produced by the embryo, maintains the corpus luteum of the ovary.
 - (E) At the end of the first trimester, the fetus assumes distinctively human features.
46. Which of the following is/are the correct statement/statements about human upper limb?
- (A) Only flexion and extension occur in the elbow joint.
 - (B) Adapted for erect posture, weight lifting and movement over a wide range.
 - (C) Head of the humerus articulates with glenoid cavity of the scapula to form the shoulder joint which is an incomplete ball and socket joint.
 - (D) The distal ends of bones in lower part of the upper limb articulate with carpal bones to form the wrist joint.
 - (E) The nine carpal bones are arranged in two rows as proximal and distal.
47. Select the correct response/responses about plant and animal breeding techniques
- (A) The first prerequisite of artificial selection is the availability of variations with respect to the desirable characters of the plants and animals selected for breeding.
 - (B) Inbreeding is used for developing pure lines in agriculture.
 - (C) Mating of genetically unrelated pure-bred plants or animals in the same breed is known as hybridization.
 - (D) Characteristics such as growth rate and fertility of offspring from hybridization are improved over those of its parents.
 - (E) Mating of plants or animals of the same breed is known as outbreeding.
48. Select the correct response/responses about the cloning vectors used in recombinant DNA technology.
- (A) Restriction maps are important in constructing them.
 - (B) All genes possessed by them are genes required for a vector.
 - (C) A cloning vector has multiple cloning sites.
 - (D) The main purpose is to copy DNA in an *in vivo* system.
 - (E) All vectors recombine with DNA of interest.
49. Select the correct response/responses regarding eutrophication of water bodies.
- (A) This causes algal blooms.
 - (B) It creates an oxygen depleted zone in the water body.
 - (C) It greatly increases the populations of fish.
 - (D) This is due to the extensive use of agrochemicals.
 - (E) Inhibits the growth of algae.
50. The method/methods used in sterilization of microbial culture media is/are,
- (A) steaming in an autoclave with 121°C temperature at a pressure of 1 atm for 15 minutes.
 - (B) filtering with membrane filters having pores from 0.01 µm to 0.45 µm size.
 - (C) heating using bunsen flame.
 - (D) heating to about 170°C and maintain for 2 hours in a dry air oven.
 - (E) exposing to ultra violet rays directly.

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Final Term Test, 2024 October

09

E

II

ජීව විද්‍යාව	II
Biology	II

13 ශ්‍රේණිය (A/L) 2024
Grade -13 (A/L) 2024

පැය තුනයි
Three hours

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Additional Reading time 10 minutes

Name : **Class :**

- * This question paper consists of **10** questions in **13** pages.
- * This question paper comprises Part A and Part B. The time allotted for both parts is **three hours**

- * Answer **all four** questions on this paper itself.
 - * Write your answers in the space provided for each question. Note that the space provided is sufficient for your answers and extensive answers are not expected.
- PART B – Essay (page 13)**
- * Answer **four** questions. Use the papers supplied for this purpose. At the end of the time allotted for this paper, before handing over to the supervisor tie the two parts together so that Part **A** is on the top of Part **B**.
 - * You are permitted to remove only part **B** of the question paper from the examination hall.

Part	Question No.	Marks
A	1	
	2	
	3	
	4	
B	5	
	6	
	7	
	8	
	9	
	10	
Total		
Percentage		
Part II - Final marks		

Part I	Part II	Total
$\overline{50}$	$\overline{50}$	$\overline{100}$

Visakha Vidyalaya- Colombo 05 - Biology - 2024 A/L – Grade 13 - Final Term Test - 2024

Part A-Structured Essay

Answer **all** questions on **this paper itself**.

(Each question carries **100** marks)

(1) A) (i) State the major property of water for small insects to live on the surface of the pond.

.....

(ii) (a) What is the additional polar group attached with the phosphate group in the phospholipid molecule?

.....

(b) Name the groups of amino acid which form the backbone of the polypeptide.

.....

(iii) State how phosphodiester bond is formed .

.....

.....

.....

(iv) State how the structure of cytoskeleton microfilaments are formed?

.....

(v) State the importance of cell cycle controlling checkpoints .

.....

(vi) Name the method and the phase of cell division which produces the genetically different two nuclei within the same cell.

• The cell division -

• The phase -

(vii) (a) What is the absorption spectrum of photosynthesis ?

.....

.....

(b) Give a similarity and a difference between the end products formed in glycolysis and the pyruvate oxidation.

The similarity-.....

The difference -.....

- (B)
- (i) How many years ago first fossils of photosynthetic organisms were originated?

.....

- (ii) State the classification levels introduced by Carolous Linnaeus.

.....

- (iii) Give biological definition of the species.

.....

.....

- (iv) Name the domain that includes organisms sensitive to antibiotics.

.....

- (v) Complete the dichotomous key using the organisms/groups of organisms given below.

Obelia, Diatoms, *Euglena*, *Gelidium*, *Fasciola*

- (1) Unicellular ,

Multicellular

- (2) Eye spots are present

Eye spots are absent

- (3) Hold fast is present

Hold fast is absent

- (4) Bears a dorsoventrally flattened body

Absence of a dorsoventrally flattened body

- (vi) (a) State a plant genus which bear bisexual gametophytic generation.

.....

- (b) What is the basic feature used in the classification of seed plants into two major groups.

.....

(C)

- (i) (a) State the first phylum of organisms in which the following structures were present.

Coelom-

Organs for excretion -.....

- (b) State a characteristic of a sexual reproduction in reptilian from which the most amphibians differ.

.....

(ii) (a) State a benefit provided for the plant itself from each of the following adaptations in xylem tissue of vascular plants.

- Thickening of the tracheids by lignin-.....
- Presence of perforated plates in vessel elements- -.....

(b) State a basic function of the pericycle of dicot root.

.....

(c) What are the major tissues in the bark of the woody plant.

.....

(d) Name a plant phylum which bears flagellated sperms and produces soft wood.

.....

(iii) (a) State a structural adaptation possessed by the guard cells for stomatal movement.

.....

(b) What are the methods of transportation of solutes from symplast to the apoplast.

.....

(c) State two differences between transpiration and the guttation..

.....

.....

(iv) Define nutrition in plants.

.....

.....

(v) State a structural feature of the female gametophyte of *Selaginella*

.....

(2) (A)

(i) (a) Write the place where *Cycas* pollen grain develops into mature female gametophyte.

.....

(b) State two common reasons for seed dormancy.

.....

.....

(ii) (a) What is the photoperiod?

.....

.....

(b) How, the changes occurred in plant form due to mechanical disturbances are named.

.....

(iii)(a) Name the plant hormones which perform following functions.

• retards leaf abscission
.....

• stimulate pollen tube growth
.....

(b) State a induced chemical defense mechanism in plants.

.....

(iv) State the types of epithelial tissues found in the linings of buccal cavity and the intestinal cavity.

• the linings of buccal cavity-.....
.....

• the linings of the intestinal cavity-.....
.....

(v) Draw a fully labeled diagram of motor neuron in the space given below.

(vi) State the nutritional relationship found in the cellulose digesting microorganisms in termites.

.....

(vii) State the place in human digestive system where the digestion of nucleic acids begins.

.....

(B)

(i) (a) State a structural adaptation in the small intestine to carry out efficient absorption ?

.....

(b) Write the scientific name of the bacterium that is associated with long lasting gastritis condition.

.....

(c) Name an animal phylum which possesses only open circulatory systems.

.....

(ii) (a) State the circuit of blood that always transports oxygen poor blood.

.....

(b) State a major difference between single circulation and double circulation .

.....

(c) Name major components of the lymphatic system.

.....

(iii) (a) State a important feature observed in a ECG tracing to obtain the information about the heart function of a person.

.....

(b) What is diastolic pressure.

.....

(c) Give cellular components of blood .

.....

(iv) (a) State an adaptation in the erythrocytes to transport higher number of hemoglobin molecules.

.....

(b) State the importance of lung ventilation .

.....

.....

(c) What is understood by internal respiration .

.....

.....

(v) (a) Name a respiratory disorder which leads to pulmonary hypertension.

.....

(b) Name the lung capacity which is important for continuous exchange of gas in the alveoli and to prevent the collapse of the alveoli during expiration.

.....

(vi) What are introduced as effector cells in acquired immunity.

.....

(C)

(i) (a) Name two effector forms of T lymphocytes.

.....

(b) State a cell type involved in secondary immune responses in the body.

.....

(c) State a difference between active immunity and passive immunity.

.....

.....

(ii) (a) Name the type of immunity developed in the human body through each of the following vaccinations .

- BCG vaccination -
- Vaccination against snake venom -

(b) How does autoimmune disease differ from a immunodeficiency disease.

.....

.....

.....

.....

(c) State a factor which determines the relationship between metabolic substrates and excretory products.

.....

(iii) (a) Name the nitrogenous excretory product of insects .

.....

(b) What is the secretion related to urine formation in human.

.....

.....

(c) What is the importance of the secretion.

.....

.....

(3) A (i) (a) State a substance secreted in urine formation to maintain the pH in blood.

.....

(b) Name a hormone acts on distal convoluted tubule to increase Na⁺ reabsorption and the place it is synthesized .

- the hormone-.....
- the place synthesized-.....

(c) Write a function of cerebrospinal fluid .

.....

(ii) (a) Name the functional area of the brain responsible for the complex mental functions such as memory, intelligence and reasoning.

.....

(b) Name the areas of the brain which carry out each of the following functions.

- Maintains posture and balance -
- Regulates appetite -

(c) Name two efferent components of peripheral nervous system.

.....

.....

(iii)(a) Name an effector organ for each component given in (ii) (c).

.....

.....

(iv) Name the neurotransmitter released by the sympathetic nervous system.

.....

(B) (i) (a) State the reason for the fusion of vesicles containing neurotransmitters to the presynaptic membrane.

.....

(b) Name the mental disorder associated with the progressive and irreversible degeneration of neurons in cerebral cortex.

.....

(c) Name the middle layer of the wall of the human eye.

.....

(ii) (a) Which area of the above (i) (c) is important for controlling the size and the thickness of the eye lens.

.....

(b) State major tissue type in epidermis and dermis of the human skin..

• Epidermis -

• Dermis -

(c) State a reason for the production of color in the human skin.

.....

(iii)(a) Name two hormones released from the posterior pituitary .

.....

.....

(b) What is a positive feedback mechanism .

.....

.....

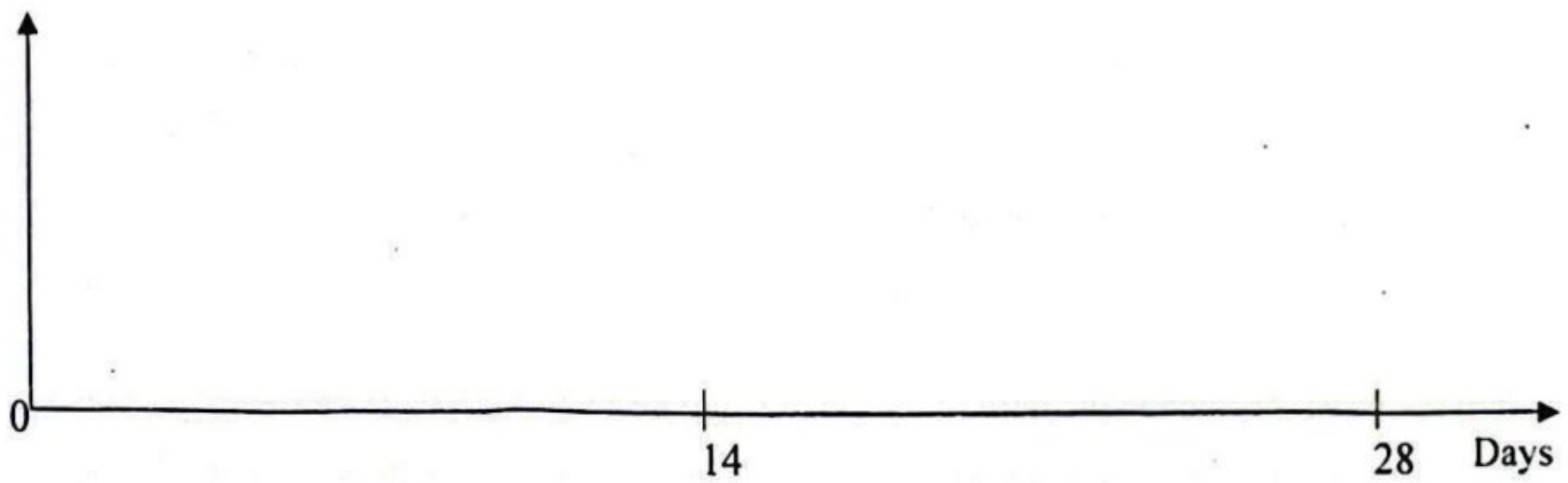
(c) State a difference between asexual and sexual reproduction .

.....

.....

- (iv) (a) Indicate below how the levels of pituitary hormones change in blood during 28 days of reproductive cycle of a mature woman.

Blood hormone level



- (b) State the hormone given with Depo-Provera injection for females.

.....

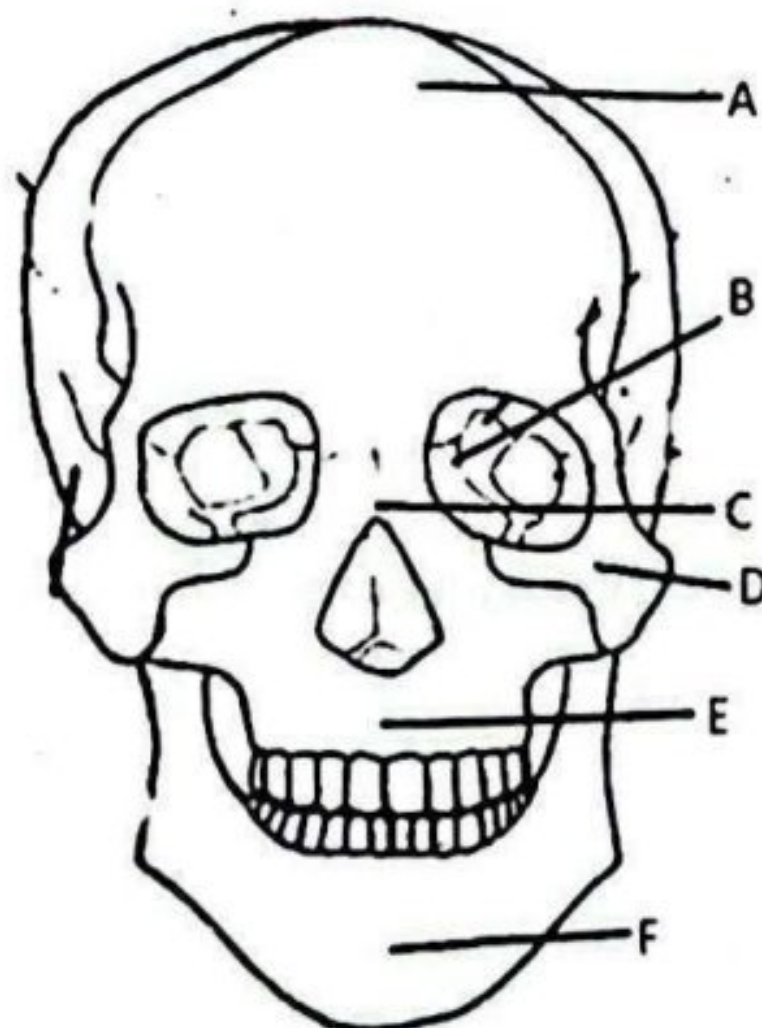
- (c) State a method from modern reproductive technology for resolving infertility problems

.....

- (d) Name a sexually transmitted bacterial infection.

.....

- (v) (a) Anterior view of the human skull is shown below .



Name the bones label from A to F

A

B.....

C

D.....

E

F.....

- (b) Name a facial bone among above having sinuses .

.....

- (vi) (a) Name a movement in knee joint in human lower limb.

.....

(b) State an adaptation in human axial skeleton to maintain the erected posture .

.....

(C) (i)

(a) State the second law of Mendel .

.....

.....

(b) What is the objective of carrying out a test cross..

.....

(ii) (a) Write the phenotypic ratio of the children produced by a marriage between a mother and a father having the genotypes $I^A i$ and $I^B i$ respectively for the blood groups .

.....

(b) Name a X linked recessive disorder in human.

.....

(iii)(a) State briefly how activation and deactivation of some epigenetic genes occur.

.....

.....

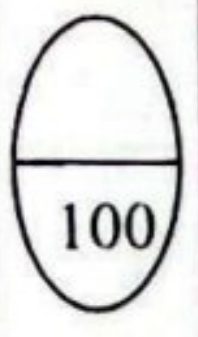
(b) What is the evolution of a species.

.....

(iv) What is DNA packaging .

.....

.....



(4) (A) (i) (a) State the reason for the difference in enzymes participated in replication of DNA in prokaryotes and eukaryotes .

.....

.....

(b) What are exons?

.....

(c) State two molecules, function as final gene products.

.....

.....

(d) Write a form of protein which is rapidly degraded after their function .

.....

(ii) Write two applications of PCR in medicine.

.....

.....

(iii) Why variations in small tandem repeats (microsatellite) used in DNA fingerprinting do not have an impact on phenotype.

.....

(viii) What is the labeling of a DNA probe.

.....

(ix) State an objective of Cartagena protocol.

.....

(B)

(i) (a) What is the population ?

.....

(b) Write an example for biotic- abiotic interaction in an ecosystem.

.....

(ii) (a) What is a biome?

.....

.....

(b) State two adaptations in desserts plants to resist on water deficiency.

.....

.....

(c) Write an example for a swamp forest which is inundate only for a short period of time in the year.

.....

(iii)(a) State two ways of releasing N_2O which causes global warming, into atmosphere .

.....

.....

(b) What are the factors which might think to degrade the coral population in 2100.

.....

(iv) Write two objectives of biodiversity convention.

.....

.....

(v) Draw the cell arrangement of Sarcinae.

(vi) State a generic name for each of the following groups of bacteria.

- Chemoautotrophs:
- Microaerophilic:

(vii) How sexual reproduction of bacteria is called?

.....

(C) (i) (a) Name two symbiotic associations produced by soil microorganisms with some plant roots.

.....
.....

(b) Name a bacterial species used in the production of bio pesticides.

.....

(ii) (a) Name the exotoxins produced by each of the following pathogens.

- *Corynebacterium diphtheriae*:
- *Clostridium tetani* :

(b) What is the effect of the antibiotic erythromycin on bacteria .

.....

(iii) Name bacterial genera participate in the different stages of nitrogen cycle other than the nitrogen fixation.

Stage

Genus of bacteria

.....
.....

(iv) Name the dye used in simple staining technique to identify the microorganisms in a yoghurt sample.

.....

(v) (a) State the application of nanotechnology to observe SARS patients.

.....

(b) What are smart drugs?

.....

(c) State a usage of stem cells in treating leukemia patients.

.....

(d) State a function of intergene in genome projects.

.....

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පීඨ විද්‍යාව	II
Biology	II

13 ශ්‍රේණිය, (A/L)2024
Grade 13 (A/L)2024

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