

Ministry of Education
Nena Pawura Practice Question Paper

கல்விப் பொதுத் தராதர உயர் தரப் பரீட்சை, 2023
General Certificate of Education (Adv. Level) Examination, 2023

உயிரியல் I
Biology I

09 E I

இரண்டு மணித்தியாலம்
Two Hours

Instructions:

- ❖ Answer all questions.
- ❖ Write your Index number in the space provided in the answer sheet.
- ❖ Read the instructions given on the back side of the answer sheet.
- ❖ When you select the response which you consider to be the best answer to a question mark your response on the answer sheet according to the instructions given in it.

(01) Which of the followings is a polymer that acts as the storage material of fungi?

- 1) Chitin 2) Collagen 3) Inulin 4) Glycogen 5) Starch

(02) Select the correct statement regarding the plant cell wall?

- 1) It is an intra-cellular structure.
- 2) Secondary cell wall is deposited outer to the primary cell wall.
- 3) It allows development of turgidity, when water enters into a cell.
- 4) Sometimes lignin can be found in the primary cell wall.
- 5) Water moves through the free spaces of the cell wall by osmosis.

(01) An event occurring during the prophase of mitosis is,

- 1) Chromatin fibers get relaxed
- 2) Centrosomes move toward opposite poles of the cell.
- 3) The nuclear envelope fragments.
- 4) The kinetochore microtubules move the chromosomes back and forth.
- 5) Spindle microtubules get depolymerized.

04) Which of the following statement is correct regarding enzymes?

- 1) All the enzymes are globular proteins
- 2) Some enzymes can alter the properties of the end products
- 3) Always the enzyme catalyzed reactions are reversible.
- 4) Some proteins in the membrane have the ability to act as enzymes.
- 5) Enzyme catalyzed reactions can never be altered by external molecules.

(05) This question is related to the following statements.

- a) Production of ATP by substrate level phosphorylation
- b) Decarboxylation happens.
- c) Incomplete oxidation of pyruvate

- 3) Platyhelminthes - Gastro vascular cavity and flame bulbs
- 4) Cnidaria - Mesoglea and Cuticle
- 5) Echinodermata - Cephalization and closed circulation

(11) Select the correct statement regarding the primary structure of a root of monocotyledon plant?

- 1) Multi cellular root hairs are produced by some epidermal cells.
- 2) Collenchyma cells are mostly present interior to the epidermis.
- 3) Outermost layer of the cortex is endodermis.
- 4) Pericycle involves in the formation of lateral roots
- 5) Endodermis is a single cellular layer without any intercellular spaces.

(12) Select the answer that mentions the correct components of elements of chlorophyll.

- 1) C, H, O, N, Fe 2) C, H, O, N, Mg 3) C, H, O, N, P
- 4) C, H, O, Fe, Mg 5) C, H, O, Zn, Fe

(13) This question is related to the followings.

- a) Unloading of sugar in sink.
- b) Phloem sap moves from source to sink by bulk flow
- c) Generates a negative pressure in the sieve tube due to take up water from the sieve tube to xylem
- d) Take up of water from the xylem by osmosis generates a positive pressure in the sieve tube
- e) The water potential is reduced in the sieve tube by unloading of sugar

In which of the followings the correct sequence of phloem translocation is given?

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

(14). Select the correct statement regarding the geotropic movements of a plant root according to the statolith hypothesis.

- 1) Auxin gets accumulated at cell division zone of root.
- 2) Cell elongation is inhibited at high concentration of auxin.
- 3) Statoliths present in all the cells of the root cap respond to gravity.
- 4) Re-distribution of Ca^{2+} ions happens as a result of accumulation of statolith at lower side of apical meristem of root.
- 5) More rapid elongation on lower side and slow growth on upper side happen by auxin.

15) In which of the followings the plant growth substances which promote and delay the leaf senescence are given in the proper sequence?

- | | | |
|------------------------------|--------------------------------|---------------------|
| 1) Cytokinins, Abscesic acid | 2) Abscesic acid, Gibberellins | 3) Ethylene, Auxins |
| 4) Auxins, Ethylene | 5) Abscesic acid, Cytokinins | |

16) Some defense mechanisms shown by plants during biotic stresses are given below.

- A) The structure of the epidermal cell walls and thickness
- B) Formation of cork and abscission layers
- C) Enzymes that can degrade fungal cell walls
- D) Toxic compounds

The induced structural and chemical defense mechanisms of the above are,

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

(17) In which of the followings the functions and the types of tissues is correctly matched?

- | | | |
|--------------------------------|---|----------------------------|
| 1) Allows materials to diffuse | - | Simple cuboidal epithelium |
| 2) Sweep the mucous | - | Simple columnar epithelium |
| 3) Provide tensile strength | - | Fibrous connective tissue |
| 4) Act as a thermal insulator | - | Areolar connective tissue |
| 5) Secretion | - | Simple squamous epithelium |

(18) Which of the followings is correct regarding the chemical digestion processes happen inside the human digestive system?

- 1) DNA is converted into nitrogenous bases, sugars and phosphates by pancreatic nucleases.
- 2) Intestinal amylase converts polysaccharides into disaccharides.
- 3) Conversion into smaller polypeptides, small peptides and amino acids happens by pancreatic carboxy peptidases.
- 4) Polypeptides are converted to amino acids by intestinal proteases.
- 5) Intestinal lipase converts triglycerides into fatty acids, glycerol and monoglycerides.

(19) Which of the following vitamin deficiency causes the deficiency symptoms for anemia?

- | | | |
|-------------------------|--------------------------|---------------------------------|
| 1) Thiamine, Pyridoxine | 2) Pyridoxine, Cobalamin | 3) Pantothenic acid, Folic acid |
| 4) Folic acid, Niacin | 5) Retinol, Pyridoxine | |

(20) Which of the followings is correct regarding the process of blood clotting?

- 1) Platelets, vitamin K and Mg^{2+} ions act as the factors for blood clotting.
- 2) Damaged platelets release prothrombin which is a clotting factor.
- 3) Prothrombin which is a plasma protein is converted to thrombin by heparin.
- 4) Fibrinogen aggregates and form a network of the clot..
- 5) When the blood vessel is damaged the connective tissues is exposed and platelets adhere to the collagen fibers in the connective tissue.

(21) Select the correct statement regarding the process of homeostatic control of breathing.

- 1) The process starts with the increment of blood pH value.
- 2) Medulla sends signals to the intercostal muscles and the diaphragm to contract and decrease the depth and rate of breathing
- 3) Increment of pH of the cerebrospinal fluid is detected by the medulla.
- 4) Increment of pH of blood is detected by the sensors present in the wall of the lungs.
- 5) The regulation of breathing is also modulated by additional neural circuits in the pons,

(22) Select the answer in which the animal and the excretory products are correctly matched?

- | | | |
|---------------|---|-----------|
| 1) Tadpole | - | Ammonia |
| 2) Prawn | - | Uric Acid |
| 3) Cockroach | - | Urea |
| 4) Shark | - | Ammonia |
| 5) Salamander | - | Uric Acid |

(23) Which of the followings is correct regarding the autonomic nervous system of human?

- 1) It consists of neurons that carry nerve impulses to control the functions of smooth muscles and skeletal muscles.
- 2) Emptying the bladder is promoted by the sympathetic division of autonomic nervous system.
- 3) The neurotransmitter secreted by the parasympathetic division is norepinephrine.
- 4) Sympathetic nerves arise only from the spinal cord.
- 5) Parasympathetic stimulations prepare the body to deal with energy generating situations.

(24) Which of the followings is correct regarding the structure of human eye?

- 1) Most of the smooth muscle fibers present in ciliary body is circular.
- 2) The white and opaque outermost layer of the anterior and lateral parts of the eye ball is sclera.
- 3) Conjunctiva lines the iris and front of the eye ball.
- 4) Aqueous humor is secreted by cornea.
- 5) The inner most layer of retina is pigmented epithelium.

25) Which of the following statements is correct about the process of human oogenesis in human females?

- 1) If a sperm penetrates the secondary oocyte it divides into the mature ovum and first polar body.
- 2) LH stimulates follicle growth, aided by FSH.
- 3) Secondary oocyte starts the meiosis II, but stops at the anaphase.
- 4) At birth, the ovaries together contain about 3-4 million primary oocytes.
- 5) During oogenesis there are long interruptions.

26) Which of the following statements is correct about the hormonal control of the male reproductive system?

- 1) FSH causes Leydig cells to produce testosterone.

- 2) LH stimulates sertoli cells to nourish the developing sperms.
- 3) Testosterone stimulates the secretion of inhibin by the Sertoli cells.
- 4) Two negative – feedback mechanisms control sex hormone production in males.
- 5) Further inhibition acts on anterior pituitary gland to increase FSH secretion.

27) Which of the following relationships is correct about the part of the structure of the human skeletal system and functions.

The structure

Functions.

- | | |
|------------------------|---|
| 1) Intervertebral disc | support |
| 2) Xiphoid process | Gives attachment to the diaphragm and ribs. |
| 3) Sternum | Provide articulating surfaces for direct articulation of 1 – 10 pairs of ribs |
| 4) Glenoid cavity | Provide articulating surface for the head of the femur. |
| 5) Clavicle | Act as the main site for production of blood cells. |

28) Which of the following statements is correct about the structure of the sarcomere and mechanism of muscle movement.

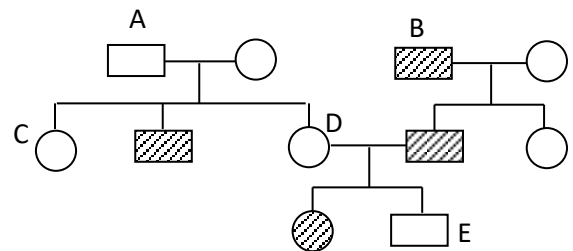
- 1) Sarcomeres are seen in skeletal muscle and smooth muscle cells.
- 2) Thick filaments are only seen in the middle region of the sarcomeres.
- 3) At the resting stage of myofibrils, thick and thin filaments are fully overlapped.
- 4) The mechanical function arising from sarcomeres is only produced by myosin protein.
- 5) Thick and thin filament permits the shortening of the sarcomeres by changing the length during muscle contraction.

29) The inheritance of trait, attached ear lobe, over three generations in a particular family is represented in the pedigree chart given below.

1st generation

2nd generation

3rd generation



Select the correct statement according to the above pedigree chart.

- 1) The person "A" possess a dominant homozygous condition regarding the relevant character.
- 2) The person "B" possess a heterozygous condition regarding the relevant character.

- 3) The person "C" may possess a heterozygous condition regarding the relevant character.
- 4) The person "D" may not possess a dominant homozygous condition regarding the relevant character.
- 5) The person "E" may be heterozygous or dominant homozygous regarding the relevant character.
- 30) The colour of human eyes follows Mendelian patterns of inheritance.

Brown eyes are dominant over blue eyes.

In a marriage between a male with blue eyes and a female with brown eyes, the first child was with blue eyes. What is the percentage of the second baby with blue eyes too?

- 1) 0% 2) 25% 3) 50% 4) 75% 5) 100%

- 31) Select the correct statement and answer based on the following two statements.

X – Universality of the genetic code.

Y – When a gene isolated from one organism and inserted into another related or non-related organism should express the same protein.

- 1) X is correct, Y is incorrect
- 2) X is incorrect, Y is correct.
- 3) X and Y both are incorrect.
- 4) Both X and Y are correct and Y is aided by X
- 5) Both X and Y are corrected and X is not aided by Y.

- 32) This question is based on following statements.

- A) DNA pieces can be integrated into cloning vectors and the recombinant vectors.
- B) Selection of transformed cells.
- C) Insertion into bacteria.
- D) A genome is cut into random pieces by shearing using mechanical forces or by restriction enzymes.
- E) All colonies are isolated and cultivated separately.

Which of the followings indicates the correct order carried out in construction of a genomic DNA library?

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

33) Following statements are about ecological pyramids.

- a) The pyramid of energy describes the overall nature of the ecosystem.
- b) In all pyramids of numbers there is a gradual decrease in the number of individuals from the lower to the higher trophic levels.
- c) Dry weight of the biomass represents the amount of energy available in the form of organic matter of an organism.

The correct of the above is/ are?

- 1) a only
- 2) b only
- 3) c only
- 4) a and c only
- 5) b and c only

34) Select the correctly match answer about biomes and characteristic feature.

Biomes	Characteristic feature
1) Tropical rainforests	Leaves of deciduous species fall in the dry season.
2) Savanna	Presence of animals that have effective locomotion for long distance migration.
3) Dessert	Seed germination occurring only after a hot fire.
4) Chaparral	Plants with vertical stratification.
5) Temperate grasslands	Epiphytes are common.

35) Which of the following statements is an important of educational values of biodiversity?

- 1) Knowledge about how animals react before a natural disaster.
- 2) Helps to generate revenue by designing of zoological gardens.
- 3) Some trees are sacred for Buddhists.
- 4) Carbon dioxide fixation through photosynthesis.
- 5) Recharging of ground water.

36) Which of the following statements is a difference between endotoxins and exotoxins.

- 1) Endotoxins are thermo-labile while exotoxins are thermos-stable.
- 2) Endotoxins are produced only by gram positive bacteria while exotoxins are produced only by gram negative bacteria.

- 3) Endotoxins are being inactivated by boiling while exotoxins are not being inactivated.
- 4) Endotoxins are enzymes while exotoxins are part of the microbial cells.
- 5) Endotoxins are lipopolysaccharides while exotoxins are protein.

37) Followings are the diseases of human caused by microorganisms.

- a) Food poisoning
- b) Tuberculosis
- c) Conjunctives
- d) Tetanus

Which one of the followings represents the correct order of letters denoted by the disease of human caused by *Staphylococcus aureus*, *Clostridium tetani*, Adenovirus, *Mycobacterium tuberculosis*?

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

38) Which of the following statements is a step of the secondary treatment of waste water treatment?

- 1) Enhancing the sedimentation by adding alum.
- 2) Removal of 25 – 35% organic matter.
- 3) Disinfection by ozone.
- 4) Using activated carbon for the removal of toxic chemicals.
- 5) Slowly sprinkling or spraying water over bed of rocky material and allowing to trickle.

39) Which of the following consists of generic names of micro-organisms in order which produce Citric acid, Tetracycline and Lipase?

- 1) *Streptomyces*, *Aspergillus*, *Rhizopus*.
- 2) *Aspergillus*, *Streptomyces*, *Rhizopus*.
- 3) *Aspergillus*, *Bacillus*, *Pseudomonas*.
- 4) *Bacillus*, *Rhizopus*, *Aspergillus*.
- 5) *Penicillium*, *Streptomyces*, *Rhizopus*.

40) A common infectious disease of fresh water ornamental fish, caused by a unicellular external parasite.

- 1) Heamorrhagic septicaemia.
- 2) Fin rot and gill rot.

- 3) Trichodiosis.
- 4) Columnaris disease.
- 5) White spot disease.

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

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

Summary of above instructions				
1	2	3	4	5
Only (A) (B) and (D) correct	Only (A) (C) and (D) correct	Only (A) and (B) correct	Only (C) and (D) correct	Any other response or combination of responses correct

- 41) Which of the followings is/are correct about cellular organelles and functions.
 - A) Smooth endoplasmic reticulum – Metabolism of carbohydrates.
 - B) Lysosomes – Detoxification of peroxide.
 - C) Rough endoplasmic reticulum – Produce transport vesicles
 - D) Golgi apparatus – Manufacturing cell wall components such as pectin.
 - E) Peroxisome – Digest worn out organelles.
- 42) Which one of the following consists of plant genera which show homosporous?
 - A) *Anthoceros* and *Marchantia*
 - B) *Nephrolepis* and *Selaginella*
 - C) *Pogonatum* and *Lycopodium*
 - D) *Lycopodium* and *Pinus*
 - E) *Gentum* and *Anthoceros*.
- 43) Which of the following statements is/are correct about the reproduction of flowering plants?
 - A) The stamen consists of three lobed anther.
 - B) Male gametes are produced within the anther by meiosis of microspores.

- C) Pollen grains are developed within the microsporangium and released.
- D) The pollen tube moves through the micropyle and discharge male gametes into the embryo sac.
- E) The nature embryo sac consists of eight nuclei and cells.
- 44) Which of the following statement/ stamens is/are correct regarding interferons?
- A) Secreted by virus infected cells.
- B) Promote inflammatory response.
- C) Promote phagocytosis.
- D) Stimulate production of anti-viral proteins.
- E) Destruct invading cells.
- 45) Select the combination/ combinations of hormones with antagonistic actions.
- A) Follicle stimulating Hormone – Luteinizing Hormone.
- B) Adrenaline – Noradrenaline.
- C) Insulin –Glucogan
- D) Calcitonin –Parathormone
- E) Estradiol –Progesterone
- 46) A hereditary pattern/ patterns which results from expression of two or more genes is/are
- A) Peliotrophy
- B) Dominant epistasis
- C) Polyalleslism
- D) Polygenic inheritance
- E) Co - dominance
- 47) Select the correct statement/ statements regarding the architecture of prokaryotic chromosomes.
- A) Proteins associated with DNA, cause DNA to super coil and compact.
- B) RNA – protein core attaches the chromosomes to the membrane.
- C) The looped domains coil, fold and compact to form the mitotic chromosome.
- D) The loops of compacted mass of DNA to a consistency of RNA and protein.
- E) The nucleosomes twist and pack in a spiral fashion to form a chromatin fiber.

- 48) Which of the following statement/statements is/are correct regarding the type of forest in Sri Lanka which harbour the largest elephant population in Asia?
- A) There's no marked dry spell in these forests.
 - B) These forests were greatly affected due to tea cultivation.
 - C) These forest are characterized by having a well-developed shrub, herb layer.
 - D) Plant species Ebony and Weera are naturally found in these forest.
 - E) Periodic fires are common in these forests.
- 49) Which of the following microbial activities can be accelerated by aeration?
- A) Conversion of alcohol to acetic acid
 - B) Production of compost
 - C) Production of wine from grapes.
 - D) Production of biogas
 - E) Production of citric acids from sucrose.
- 50) Which of the following/s is /are correct regarding the propagation methods used in the Floriculture industry?
- A) Anthurium and Orchid plants can be produced using seed propagation methods.
 - B) Anthurium and Begonia can be propagated via leaf cutting
 - C) In layering, stems are rooted while attached to the parent plant.
 - D) Initially a callus bridge is formed between the scion and rootstock in a successful graft.
 - E) Layering is the most common method of plant propagation.