

**Ministry of Education, Sri Lanka**  
**Science Branch**

**General Certificate of Education (Adv. Level) Examination, 2020**  
**Revision Exercises**

**Biology I**

**09**

**E**

**I**

- ❖ Answer all questions.
- ❖ Write your Index number in the space provided in 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.

- 1) Select the **correct** statement about carbohydrates.
  - 1) All are reducing sugars.
  - 2) All are having glycosidic bonds.
  - 3) The ratio between H: O of all carbohydrates is 2:1.
  - 4) The simplest carbohydrate has 2 carbon atoms.
  - 5) All carbohydrates are macromolecules.
  
- 2) Which **is not** a basic common characteristic for both prokaryotic and Eukaryotic cellular organization?
  - 1) Presence of DNA as genetic material.
  - 2) Presence of subcellular components in cytosol.
  - 3) Cells are bounded by plasma membrane.
  - 4) Ribosomes are present within cells.
  - 5) Cells are bounded by cell wall.
  
- 3) Select the most suitable microscope type which can be used to observe the surface three dimensional (3D) structure of pollen grain.
  - 1) Simple microscope.
  - 2) Compound light microscope.
  - 3) Transmission electron microscope.
  - 4) Scanning electron microscope.
  - 5) Simple dissecting microscope.

- 4) Which of the following is **correct** about enzymes?
- 1) All chemical bonds are broken down at medium with pH 2.
  - 2) Their presence alters the nature or properties of the end products of many reactions.
  - 3) All inhibitors bound with the enzyme by ionic bonds permanently.
  - 4) ADP acts as an allosteric inhibitor in some enzymes.
  - 5) Some inhibitors selectively bind to the active sites of the enzymes.
- 5) Which of the following is **not** a main event in a Eukaryotic cell cycle?
- 1) Duplication of centrosomes.
  - 2) Disappearance of nucleolus.
  - 3) Pairs of homologous chromosomes move towards the metaphase plate.
  - 4) Nucleic matter mixed up with the cytosol after breaking down the nuclear membrane.
  - 5) Chromatin is made by winding DNA around histone protein.
- 6) An organic compound which produced in both Calvin cycle and Glycolysis is,
- |                                  |                      |
|----------------------------------|----------------------|
| 1) Pyruvate.                     | 4) Malate.           |
| 2) Glyceraldehyde -3- phosphate. | 5) Phosphoglycolate. |
| 3) Ribulosebisphosphate.         |                      |
- 7) Which of the following is **not** a step when the rate of photosynthesis is determined by using the Audus micro burette?
- 1) Cut end of the aquatic plant is inserted upright to the tube which contain dilute  $\text{NaHCO}_3$  solution.
  - 2) Light source is kept away from aquatic plant at 'd' distance.
  - 3) Soap solution is added to the Audus micro burette by using syringe.
  - 4) The distance of the air bubble travelled within the capillary tube is measured.
  - 5) Direct collected oxygen in bending arm towards the calibrated tube.
- 8) *Nephrolepis* differs from *Selaginella*, as *Nephrolepis*,
- 1) Shows heteromorphic alternation of generation.
  - 2) Possesses multicellular gametangia.
  - 3) Possesses dependent embryo.
  - 4) Possesses monoecious gametophyte.
  - 5) Shows heterospory.
- 9) Which of following shows the correct relationship between structure and function?
- 1) Parapodia - Feeding and locomotion
  - 2) Tube feet - Feeding and excretion
  - 3) Setae - Locomotion and respiration
  - 4) Suckers - Locomotion and ingestion.
  - 5) Clitellum - Internal fertilization.

10) Select the common feature for the organisms in both phylum Nematoda and phylum Annelida.

- 1) Exist in marine, fresh and wet terrestrial environments.
- 2) Bodies possess distinct head and segmentation.
- 3) Absence of respiratory and circulatory systems.
- 4) Presence of longitudinal and circular muscles in body wall.
- 5) Triploblastic coelomates with cylindrical bodies.

11) Several characteristic features shown by kingdom fungi are given below.

- a) Production of non-motile spores in asexual reproduction
- b) Mycelium is coenocytic and aseptate.
- c) Production of sexually differentiated gametangia.
- d) Production of endogenous sexual spores.

Which of the above features are common for both phyla Ascomycota and zygomycota.

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

12) Which of the following feature is common for both meristematic and collenchyma cells?

- 1) Ability to multiply.
- 2) Presence of central vacuole.
- 3) Consist only primary cell wall.
- 4) Presence of central nucleus.
- 5) They are generally elongated.

13) Which of the following statement is **incorrect** regarding the methods of water and solutes movement?

- 1) The diffusion of free water molecules across a selectively permeable membrane is called osmosis
- 2) Adsorption of free water molecules by cellulose cell walls is an example for imbibition.
- 3) Bulk flow is independent of solute concentration gradient.
- 4) The movement of a population of molecules by diffusion is directional.
- 5) Movement of water and solutes via cell membranes of collenchyma takes place by bulk flow.

14) Which of the following is **correct** regarding the life cycle of terrestrial plants?

- 1) Always sporophytes produce spores by mitosis.
- 2) They gametophytes of all seedless plants are photosynthetic.
- 3) Sporophytes of all terrestrial plants are differentiated in to true stems, leaves and roots.
- 4) Seedless plants show homosporous as well as heterosporous.

5) All seed plants depend on water for fertilization.

15) Which of the following is **correct** regarding the comparison between shoot apex and root apex?

Shoot apex	Root apex
1) Protected by leaf primordia	Protected by root primordia
2) Produces new cells only outward	Produces new cells inwards and outwards
3) Shows positive geotropism	Shows negative geotropism
4) During cell differentiation collenchymal cells are formed	During cell differentiation collenchymal cells are not formed
5) Dermal tissues can form specialized guard cells	Dermal tissues can form specialized trichomes

16) Which of the following is a structural feature of epithelial tissue?

- 1) It is highly vascularized.
- 2) Always it consists of several layers of cells.
- 3) It consists of different types of cells.
- 4) Inter cellular spaces are abundant.
- 5) In some epithelia, some cells do not reach to the apical surface.

17) Which of the following pair is **correct** regarding the feeding mechanism of animals?

- 1) Fluid feeders - Maggot
- 2) Substrate feeders - Mosquito
- 3) Bulk feeders - Cow
- 4) Filter feeders - aphid
- 5) Fluid feeders - Clam

18) Which of the following phyla possess the circulatory system; there is no distinction between the circulatory fluid and the intestinal fluid surrounding cells?

- 1) Arthropoda and Mollusca
- 2) Arthropoda and Echinodermata
- 3) Cnidarian and Mollusca
- 4) Echinodermata and Annelida
- 5) Arthropoda and Annelida

19) Which of the following is **not** a risk factor for hypertension?

- 1) Diabetes mellitus.
- 2) Intake of salt.
- 3) Smoking.
- 4) Stress.

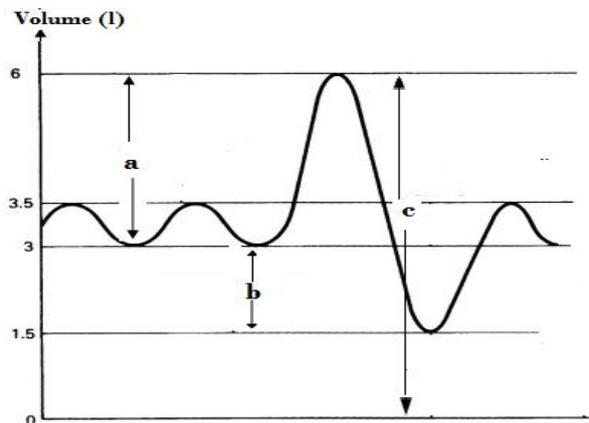
5) Deposition of low density

lipoprotein (LDL) on artery wall.

20) Which of the following combination correctly shows the substances present in the human blood plasma?

- 1) Glucose, CO<sub>2</sub>, Starch
- 2) O<sub>2</sub>, Haemoglobin, H<sub>2</sub>O
- 3) O<sub>2</sub>, Fibrin, CO<sub>2</sub>
- 4) CO<sub>2</sub>, Urea, Glycogen
- 5) Urea, Hormone, CO<sub>2</sub>

21.



The above given diagram denote lung capacities. Select the correct statement about a, b and c.

	A	b	c
1	Inspiratory capacity	Total lung capacity	Vital capacity
2	Vital capacity	Inspiratory capacity	Total lung capacity
3	Inspiratory capacity	Expiratory reserve volume	Total lung capacity
4	Total lung capacity	Inspiratory capacity	Vital capacity
5	Inspiratory capacity	Total lung capacity	Functional capacity volume

22. Which of the following act as the external barrier in innate immunity?

- (1) Neutrophil and complement protein
- (2) HCl and lysozyme.
- (3) Natural killer cells and monocytes.
- (4) Complement protein and interferon.
- (5) Interferon and histamine.

23. Which of the following substance can be present in the urine when the glomerulus is damaged only?



(5) During inhalation all ribs move upward and increase the volume of thoracic cavity.

28. Which of the following combination is **correct** regarding the hormone, endocrine gland and their functions?

	Endocrine gland	Hormone	Function
(1)	Hypothalamus	GHRH	Promotes the growth of muscles and bones
(2)	Ovary	FSH	Stimulate development of follicular cells
(3)	Anterior pituitary	Oxytocin	Stimulate milk ejection
(4)	Adrenal medulla	Adrenaline	Increase the heart rate
(5)	Thyroid	Thyroxin	Regulate blood $Ca^{2+}$ level

29. Select the **correct** statement about human genetic disorder and reason.

- (1) Cystic fibrosis - A dominant mutation in autosomes.
- (2) Red – green colour blindness - A mutation in Y – linked recessive mutation.
- (3) Down syndrome - Trisomy of 20<sup>th</sup> autosomal chromosome.
- (4) Klinefelter syndrome - Total number of Chromosome in genome is 45.
- (5) Turner syndrome - Presence of a single sex chromosome.

30. **Correct** statement related to genetic material in Prokaryotes is,

- (1) Presence of introns in many genes.
- (2) Presence of several small circular chromosomes in the cell.
- (3) RNA act as genetic material of some prokaryotes.
- (4) double or single stranded DNA may be Present.
- (5) Absence of exo-chromosomes as genetic material.

31. Select the **incorrect** statement about DNA recombinant technology.

- (1) Any self-replicating unit in a particular host cell can be used as vector.
- (2) Vectors carry genes which are not necessary for a vector.
- (3) Gene guns can be used to make the transformation efficiently.
- (4) Vector can be easily inserted to the host cell by mechanism of infection of the recombinant plasmid.
- (5) Yeast Artificial Chromosome (YAC) are large therefore it can be used to copy large amount of DNA.

32. Which represent the advantage of using STR (Small Tandem Repeats) marker in DNA fingerprint technology?

- A – They appear rarely in genome.
- B – Large number of characterized STRs is available.
- C – Easily amplified by polymerase chain reaction. (PCR)
- D – Presence of Highly variable polymorphisms.

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

33. Following table contains global environmental issues, pollutants and the impacts respectively.

global environmental issues	pollutants	impacts
A – Increase of global warming	P - CFC	X – Decrease of phytoplankton in hot seas
B – Depletion of ozone layer	Q – HFC	Y - Destruction of soil organism
C – Acid rains	R – SO <sub>2</sub>	Z- Increase of insect population

Select the **correct** combinations of the above mentioned contains global environmental issues, pollutants and the impacts respectively.

- (1) A,Q,Y      (2) B,P,X      (3) C,R,X      (4) A,R,Y      (5) C,P,Y
34. Which of the following institution is responsible for empowering Act number 2 – 1973 regarding Sri Lankan Flora and fauna?
- (1) Wild Life Conservation Department.  
 (2) Central Environmental Authority.  
 (3) Forest Conservation Department.  
 (4) Coast Conservation Department.  
 (5) Sri Lanka Police Department.
35. Choose the best combination regarding to the sterilization method and sterilized material/ apparatus.

Sterilization method

- (1) Membrane filters  
 (2) Incineration  
 (3) Open flame

Sterilized material/ apparatus

- Nutrient agar culture medium  
 Hospital wastes  
 Pettry dish



Use the following instructions to answer the questions 41 through 50.

Only A, B, D correct	1
Only A, C, D correct	2
Only A and B correct	3
Only C and D correct	4
Any other answer/combination of answers correct	5

- (41) Which of the following is / are **correct** regarding photosynthesis?
- A. Rate of photosynthesis in C<sub>4</sub> Plant is 50%, greater at 35%.
  - B. When a chemical process is affected by more than one factor, its rate is limited by the factor which in nearest its limited by the value.
  - C. NADPH and ATP produced in light reaction are used in oxidation happens in Calvin cycle.
  - D. ATP, NADPH and O<sub>2</sub> are produced in linear electron flow due to the excitation of photo system I and II.
  - E. CO<sub>2</sub> is efficiently absorbed by PEP in stroma of chloroplast in mesophyll cells.
- (42) Which of the following is / are **correct** regarding the theory of natural selection?
- A. The population of a species varies in characteristics among their inheritance traits.
  - B. Natural selections generally denote the integration of mandolin in genetics and population genetics.
  - C. Variation abilities for survival and production among a population may enhance the abundance of favorable characteristics.
  - D. Tolerating physical conditions is a favorable characteristic for survival and reproduction.
  - E. High fertilizing probability and over production is unfavorable for existence of population.
- (43) Which of the following pair is / are correct regarding the plant growth substances and their functions?
- A. Leaf abscission – Auxin, Ethylene
  - B. Promote leaf senescence – Abscissic acid, Ethylene
  - C. Simulate seed germination – Gibberellins, Ethylene
  - D. Simulate stem elongation – Auxin, Gibberellins.
  - E. Promote vascular differentiation – Auxin, Abscissic acid

- (44) Which of the following pair is / are correct regarding the response of plant to stresses?
- A. Drought Stress - Close the stomata due to release of Abscisic acid.
  - B. Cold Stress - alternate the lipid composition of the plasma membranes.
  - C. Cold Stress -Reduction of amount of solutes in cytosol.
  - D. Salt Stress - Keep the water potential of cell more negative.
  - E. Biotic Stress - Formation of cork and abscission layer.
- (45) Which of the following is / are **correct** regarding balance diet?
- A. Fibers present in diet satisfy the appetite.
  - B. Water is an essential nutrient that should be present in the diet.
  - C. Deficiency of thiamine in the diet leads to poor coordination.
  - D. There are eight essential amino acids are involved in the formation of proteins in the body.
  - E. Nonessential fatty acids should be obtained only from the diet.
- (46) Which of the following is / are **correct** regarding the animal tissues?
- A. Connective tissues are the most abundant tissues in the body.
  - B. Matrix of bone is composed of Chondroitin sulphate.
  - C. Blood tissues always contain fibers because it is a connective tissue.
  - D. All striated muscles are multinucleated.
  - E. Neuroglia is need for better functioning of neurons.
- (47) Which of the following is / are **correct** regarding the curvatures of vertebral column?
- A. Cervical and thoracic are secondary curvatures.
  - B. Cervical and lumbar curvatures are only needed to maintain correct posture.
  - C. Lumbar curvature is convex towards anteriorly.
  - D. Primary curvatures only present at birth.
  - E. The first secondary curvature is lumbar curvature.
- (48) As a result of marriage between free earlobe male and female get a child with attached ear lobe which of the following is / are **correct** regarding the above cross.
- A. Both male and female in the first generation is heterozygous for the particular character.
  - B. The probability of having attached earlobe child with heterozygous condition is  $\frac{1}{4}$
  - C. Child of the first generation receives the attached ear lobe allele from his mother.
  - D. There are only two phenotypes found in the 2<sup>nd</sup> generation for particular character.

E. Male of first generation is homozygote for the particular character.

(49) Which of the following are main goals of convention biological diversity?

- A. Conservation of Biodiversity
- B. Sustainable use of components of biological diversity.
- C. International trade of biodiversity.
- D. Fair and equitable sharing of benefits arising from genetic resources.
- E. Conservation of wetlands.

(50) Which of the following is / are correct regarding the stem cells?

- A. Stem cells are present in human blastocyst.
- B. Stem cells are cannot be cultivated in artificial culture media.
- C. Stem cells can be differentiated to any other cell types.
- D. Stem cells can be separated from bone marrows in human pelvic bone.
- E. Stem cells can be used as basic neuron cells for central never system.