D.S Senanayake College – Colombo 07 | 09 | E | I

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Final Term Test, June 2019

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Biology	I	Grade 13	Two hours	
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NOTE :

* Answer **all the** questions.
* Write your **Name** in the appropriate place.
* Answer questions from **1 to 50** using (1), (2), (3), (4), (5) answers by selecting the **correct or most appropriate** answer. **Indicate the answer in the given answer script using a cross.**

(1) Which of the following is correct regarding characteristics of organisms?

1) Species belongs to hierarchical level of organization.
2) Viviparity in some mangroves is an example for irritability.
3) Some non-living entities display all the characteristics of living at some stages.
4) Evolution is the ability of an organism to change overtime to another species as a result of variation.
5) Growth is an irreversible change that occurs during the life span of an organism.

(2) Which statement is **incorrect** regarding carbohydrates?

1) Present in hereditary material.
2) Some are osmotically inactive within cells.
3) Most abundant organic compounds on earth.
4) Present in all organisms.
5) All have glycosidic bonds.

(3) Which of the following is **not** a lipid?

1) Oestrogen 2) Cholesterol 3) Chondrin
4) Wax 5) Myelin

(4) The following statements are related to the organelles / subcellular components in a cell.

a - Prokaryotes also have a type of cytoskeleton which is made up of protein.

b - Both mitochondria and chloroplasts in living cells can change their shape.

c - The nuclear lamina and nuclear matrix organize the genetic material to their function.

d - Enzymes in lysosomes are most efficient in acidic environments.

True statements of above are,

1). a, b 2). c, d 3) b, d 4). a, c 5) All of the above

(5) Which of the following is correct regarding enzymes?

1) Haemoglobin is an allosteric enzyme which is made up of four subunits.
2) ADP acts as an allosteric inhibitor to slow down the production of ATP.
3) Activator involves in allosteric activation while substrate involves in cooperativity.
4) Feedback inhibition increases the catalytic activity.
5) Regulatory molecules act as reversible competitive inhibitors.

(6) Which of the following is correct regarding photosynthesis?

1) All three steps in Calvin cycle use ATP produced in light reaction.
2) Nitrogen use efficiency is higher in C_3 than C_4 due to presence of Rubisco.
3) Photorespiration is the formation of phosphoglycolate and converting phosphoglycolate to PGA using energy and releasing CO_2.
4) PEP carboxylase is the most abundant protein on earth.
5) The splitting of water molecules occur only by photons of light in grana.

(7) Which of the following is **incorrect** regarding respiration?

1) Pyruvates enter the mitochondrion via transport proteins by active transport.
2) A net amount of 30 ATP are produced in brain cells, while a net amount of 32 ATP are produced in liver and heart cells by one glucose molecule.
3) Decarboxylation occurs in both oxidation of pyruvate and citric acid cycle.
4) NADH and $FADH_2$ are produced only when glucose is used as the respiratory substrate.
5) Final electron acceptor is an inorganic molecule in aerobic respiration while the final hydrogen acceptor is an organic in anaerobic respiration

(8) Which of the following is **incorrect** regarding cyanobacteria?

1) They are photoautotrophs.
2) Nitrogen fixation occurs in akinete.
3) Do not have motile structures.
4) Vary from unicellular to colonial forms.
5) *Nostoc* is a free living organism.

(9) Which of the following is correct regarding cenozoic era?

1) Origin of mammals.
2) Cone bearing plants dominated.
3) Dinosaurs dominated and diverse.
4) Angiosperms appeared and diversified.
5) Major radiation of mammals.

(10) Some characteristic features of plant kingdom are given below.

a All vascular plants have megaphylls except lycophytes.

b Some gymnosperms have flagella in sperm.

c Pterophytes are more recent common ancestors with seed plants.

Correct statement/s is /are,

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

(11) Which of the following is correct regarding kingdom fungi?

1) Chytridiomycota is the only fungi phylum which possesses aquatic organisms.
2) Unicellular fungi do not form mycelium.
3) Ascomycota produce exogenous ascospores and endogenous conidia.
4) Monokaryotic stage is dominant in life cycle of *Agaricus*.
5) All fungi produce haustoria.

(12) An organism possesses two pairs of antenna, a cephalothorax and jointed appendages. This organism is most likely to be.

1) Prawn. 2) Millepede 3) Scorpion.
4) Centipede. 5) Spider.

(13) Which of the following is **not** a characteristic of meristemic cells?

1) Are living cells.
2) Have a central nucleus.
3) Are structurally differentiated.
4) Have a dense cytoplasm.
5) Have ability to multiply.

(14) Which of the following supports statolith hypothesis?

1) Statoliths aggregate at the top points of root cap.
2) Redistribution of Ca^{2+} at the lower side of root cap.
3) Lateral transport of auxin takes place in the root cap.
4) High concentration of auxin stimulates elongation of cells in root.
5) Rapid growth occurs at the lower side during root growth.

(15) Which of the following is correct regarding transverse sections of a monocotyledonous leaf and a dicotyledonous leaf?

1) Both have different types of mesophylls.
2) Cambium is present in-between xylem and phloem of dicot leaf.
3) Presence of collenchyma outside the vascular bundles in dicot leaf.
4) Vascular bundles are approximately in the same size in monocotyledonous leaf and in different sizes in dicotyledonous leaf.
5) Stomata are located mainly in the upper epidermis of dicot leaf.

(16) Which of the following is correct regarding methods of water and solutes movement?

1) Passive transport - Diffusion for long distance.
2) Active transport - Osmosis for short distance.
3) Passive transport - Imbibition for long distance.
4) Passive transport - Facilitated diffusion for short distance.
5) Active transport - Bulk flow for long distance.

(17) Which of the following combination is **incorrect** regarding trace element and its function?

1) Cl - Growth of pollen tube.
2) Fe - Fixation of N_2.
3) Zn – Role in DNA transcription.
4) Cu - Activator of certain enzymes.
5) Ni - Nitrogen metabolism

(18) The following are some functions related with plant growth substances.

a - Auxin - Promotes vascular differentiation.
b - Gibberellins - Stimulate pollen development.
c - Cytokinins -Promote seed dormancy.
d - Ethylene - Enhances the rate of senescence of leaves.

Correct statements are,

1) a, b, d only
2) b, c, d only
3) a & b only
4) a, b, c only
5) All are correct

(19) Which of the following is **incorrect** regarding response of plants to stresses?

1) Drought stress - Increases synthesis of Abscisic acid.
2) Cold stress - Lipids in cell membrane convert to crystalline structure.
3) Cold stress - Water in intercellular spaces freezes before freezing water in cytosol.
4) Salt stress - Water potential gradient increases from soil to root.
5) Salt stress - Presence of salt glands in mangrove plants.

(20) Select the step in holozoic mode of nutrition which **does not** occur only in alimentary canal?

1) Ingestion
2) Digestion
3) Absorption
4) Assimilation
5) Elimination.

(21) A child shows the following symptoms of vitamin deficiency.

a)Fatigue
b) Anemia
c) Delay in wound healing

Which of the followings indicates the vitamins he is deficient of respectively?

1) Pantothenic acid , Folic acid and Ascorbic acid.
2) Thiamine, Niacin and Riboflavin.
3) Riboflavin, Vitamin B_{12} and Biotin.
4) Vitamin A, Vitamin D and Vitamin C.
5) Vitamin B_2, Vitamin E and Vitamin K.

(22) Blood circulatory systems are found among animals as

A) Open blood circulatory system

B) Closed single blood circulatory system

C) Closed double blood circulatory system

Select the correct order of animals.

1) Honey bee, Turtle, Man
2) Slug, Fish, Crow
3) Mosquito, Leech, Sea lily
4) Tape worm, Prawn, Rat
5) Scorpion, Toad, Parrot

(23) Select the correct statement regarding human respiratory system.

1) Exhalation is usually an active process.
2) Partial pressure of CO_2 in blood does not affect the rate of respiration.
3) As the air is pulled rather than pushed into lungs it is positive pressure breathing.
4) Warming, humidifying and filtering process of air is completed in nasal cavity.
5) The muscles of the neck and chest may be involved in breathing in addition to intercostal muscles and diaphragm.

(24) Innate immunity,

1) Is a slow response against a broad range of pathogens and foreign substances.
2) Is found in vertebrates and invertebrates.
3) Show responses for specific invaders.
4) Lacks a chemical barrier
5) Mechanism is also provided by T lymphocytes.

(25) Select the **incorrect** statement regarding the nephron.

1) Juxta medullary nephrons reabsorb more water than cortical nephrons.
2) It consists of single long tubule with Bowman's capsule and a ball of capillaries.
3) It is lined by a single cell layered, simple epithelium.
4) Due to the size of blood cells, platelets and plasma proteins, those are not found in glomerular filtrate.
5) Regulation of K^+ and NaCl concentration is mainly achieved by distal convoluted tubule.

(26) Which one of the following characteristics of the eye does **not** involve in forming a clear image?

1) Accommodation of the eye.
2) Binocular vision.
3) Changing the size of pupil
4) Breakdown and regeneration of visual pigments.
5) Moving the eyes

(27) Which of the following hormones regulate the system by a positive feedback mechanism?

1) ADH
2) Oxytocin
3) Inhibin
4) Insulin
5) Adrenalin

(28) Select the correct statement regarding human ovum.

1) It is in the metaphase of first meiotic division during ovulation.
2) When it is in the ovary, it releases the second polar body.
3) It has a dense cytoplasm with yolk.
4) It is multicellular because corona radiata is attached to it.
5) During its formation unequal cell division takes place.

(29) Which of the following contributes the least in maintaining an erect posture in man?

1) Presence of two longitudinal arches in the foot.
2) Presence of four curvatures in the vertebral column.
3) Presence of forwardly directed eyes.
4) Presence of flattened face.
5) Increasing the size of vertebrate body of vertebra towards the base.

(30) Occurrence of albinos in humans is a double recessive Mendelian character. If 2.25 % of a certain population exhibit this character, determine the percentage of heterozygotes of that population.

1) 97.75 2) 8.5 3) 74.5 4) 7 2.25 5) 25.5

(31) Select the **incorrect** statement regarding the architecture of chromosomes in prokaryotes and eukaryotes

1) Prokaryotic chromosome is a single stranded circular DNA associated with few protein molecules.
2) The protein molecules cause the DNA to coil in both.
3) When the eukaryotic chromosomes undergo mitosis, it packs in four levels.
4) Chromatins are lightly packed as euchromatin in eukaryotes.
5) In prokaryotes, RNA also involves in chromosome packaging.

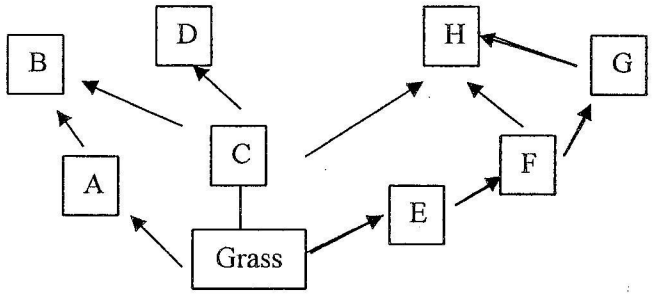
(32) Which of the following is correct regarding the enzymes involved in DNA replication?

1) Helicase - Unwind the double helix and separate the 2 stands of a DNA molecule.
2) Topoisomerase – Work in the reverse direction of DNA synthesis, reseal the cut ends.
3) Primase - In order to synthesize a new DNA strand on a template, complementary bases are added.
4) DNA polymerase - Break H bonds between 2 strands of DNA molecule.
5) DNA ligase - Form primer at the 3" end of a DNA helix / strand.

(33) Which of the following is correct regarding polypeptide synthesis?

1) During transcription, RNA polymerase catalyses the unwinding of DNA.
2) The newly synthesized pre - mRNA leaves the nucleus during the termination step in transcription.
3) Anticodon of t - RNA molecule binds to the amino acids during translation.
4) UAG codon of m - RNA strand signals the initiation of the translation.
5) P site is occupied with t - RNA attached to methionine, at the end of termination stage of translation.

(34) Which of the following is correct regarding the food web mentioned below?



1) Concentration of heavy metals is lowest in **H.**
2) When **C** is removed number of **H** will reduce.
3) **G** may be a snake.
4) The longest food chain consists of four trophic levels.
5) Primary consumers are always higher than secondary consumers

(35) Select the **incorrect** combination of "biome and characteristic"

	Biome	**Characteristic**
1)	Chaparral	Tough evergreen leaves in woody plants & fire resistant roots.
2)	Temperate broad leaf forests	Closed canopy with one or two strata of understory trees.
3)	Savanna	Grasses are dominant and three types of grasses according to their height.
4)	Northern coniferous forests	The largest biome with less diversity.
5)	Tundra	Mostly herbaceous plants with grasses and herbs.

(36) Which of the following is **not** an adaptation seen in mangroves?

1) Thick cuticle. 2) Knee roots. 3) Vivipary.
4) Fleshy succulent plants. 5) Salt glands.

(37) Which of the following is correct regarding microorganisms?

1) Psychrophiles and halophiles can be found in deep sea in Arctic Ocean.
2) Both lytic and lysogenic cycles of viruses cause the death of the host cell.
3) Virioids contain genes in RNA to infect animals.
4) Prions contain nucleic acids and cause neurological diseases only.
5) *Clostridium tetani* can survive in both aerobic and anaerobic conditions.

(38) Which of the following is correct regarding the carbon source of bacteria?

1) *Nitrobacter* and *Nitrosomonas* - CO_2
2) *Nitrobacter* and purple non sulphur bacteria - CO_2
3) *Thiobacillus* & *Nitrosomonas* - Organic carbon
4) Most bacteria - CO_2
5) Purple sulphur bacteria - Organic carbon

(39) The pathogen *Haemophilus influenzae* infect the,

1) Urinary system 2) Nervous system. 3) Digestive system.
4) Cardiovascular system. 5) Immune system.

(40) Select the correct combination

1) Neurotoxins - *Vibrio cholerae*
2) Enterotoxins – *Streptococcus pneumoniae*
3) Cytotoxins - *Salmonella typhi*
4) Endotoxin - *Corynebacterium diphtheriae*
5) Neurotoxins – *Clostridium tetani*

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

Direction 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) Which of the following is correct regarding cell division?

A) Chiasmata are visible after the synaptonemal complex dissembles.
B) Synaptonemal complex is formed between non sister chromatids of two homologs.
C) Sister chromatid cohesion can be seen only in meiosis.
D) An enzyme cleaves centromeres into two sister chromatids in each chromosome
E) Replication of DNA occurs before and after mitosis & meiosis

(42) Which of the following organisms possess plasmids?

A) *Saccharomyces cerevisiae*
B) Anabaena
C) *Oryza sativa*
D) *Thermococcus*
E) *Panthera pardus*

(43) Which of the following is **incorrect** regarding opening and closing of stomata?

A) Abscisic acid produced by apex opens stomata during water deficiency

B) Water potential of guard cells is high when stomata are open.

C) Opening and closing of stomata depends on the turgor difference in guard cells.

D) During the daytime, light stimulates the accumulation of K^+ in guard cells to open the stomata

E) When water loss from guard cells turgidity decreases and decreases the curvature of inner walls

(44) Which statement is/are correct regarding acquired immunity in human?

A) Artificially acquired passive immunity is gained by the vaccine administered to a person who is bitten by a dog having rabies

B) Naturally acquired active immunity is gained when a person get chicken pox once.

C) Artificially acquired active immunity is gained by the antitetanus vaccine administered to a person.

D) An infant get natural passive immunity by breast milk.

E) An artificial passive immunity is gained by an infant by the polio vaccine.

(45) Which of the following hormone/hormones is/are synthesize by hypothalamus?

A) TRH B) GnRH C) ACTH

D) ADH E) L.H.

(46) Which of the following statement/s is/are **incorrect** regarding human ear?

A) The vestibule and semicircular canals of the inner ear are important to maintain the balance of the body.

B) Sensory cell masses located in utricle and saccule are important in maintaining the body posture and position of the head relative to gravity.

C) Eustachian tube connects the pharynx with the middle ear to equalize the pressure in middle ear and inner ear.

D) Free end of sensory hair cells are directed towards the basilar membrane.

E) Vestibular canal and tympanic canal of cochlea of the inner ear are filled with lymph.

(47) Which of the following is/are traditional breading techniques used in farming and agriculture?

A) Artificial selection.

B) Inbreeding.

C) Out breeding.

D) Hybrid breeding.

E) Interspecific breeding.

(48) Which of the following statements is/are correct regarding applications of gene technology?

A) Production of pest resistant plants - *Bacillus thuringiensis*.

B) Production of hepatitis B vaccine – *Escherichia coli.*

C) Production of plants resistant to diseases - Potato leaf roll virus.

D) Production of plants resistant to Glufosinate - Maize.

E) Production of plants resistant to herbicide - Papaw plants resistant to ring spot virus.

(49) Which of the following effect/s is/are caused due to depletion of the ozone layer?

A) Risk of infectious diseases.

B) Poor growth of plants.

C) Loss of soil fertility.

D) Damage to early developmental stages of shrimp and fish.

E) Increases the amount of phytoplanktons in rivers and lakes.

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

A) HIV possess reverse transcriptase enzymes which transcript DNA into RNA.

B) Prokaryotic cellular organization

C) Obligatory parasites.

D) Presence of DNA or RNA as genetic material.

E) Consists of a glycolipid capsid.