



G.C.E. A/L Examination June - 2015
Conducted by Field Work Centre, Thondaimanaru
In Collaboration with
Zonal Department of Education Jaffna.

Grade :- 12 (2016)

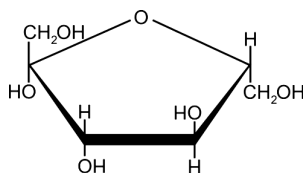
Biology

Time :- Three hours

Part I

Answer all questions

1.



Which of the following statement regarding the given sugar molecule above is correct?

- 1). It is a non reducing sugar
 - 2). It is a constituent of nucleotide
 - 3). It is not involved in the formation of poly sacchrides
 - 4). It gives sucrose with glucose by joining glycosidic bonds
 - 5). It does not give positive reaction with Benedict's reagent.
2. Which of the following property of water is favourable to aquatic organisms in the polar regions?
- 1). Transparency to light
 - 2). Anomalous expansion of volume on freezing
 - 3). Habitat
 - 4). High latent heat of fusion
 - 5). Polarity
3. Which one of the following **cannot** be an electron acceptor in bio chemical reactions in organisms?
- 1). Pyruvate
 - 2). Molecular oxygen
 - 3). Acetaldehyde
 - 4). Water
 - 5). NADP
4. Which one of the following statements regarding reactions of photo synthesis in C_4 plants is correct?
- 1). NADPH is formed only in light reactions
 - 2). Pyruvate is produced at mesophyll cell in the presence of light
 - 3). Oxygen, product of light reactions, generally does not react with PEP
 - 4). Malate actively transported to the bundle sheath cells from the mesophyll cells
 - 5). Bundle sheath cell produce their own energy requirements only by themselves.
5. Which of the following organelle/structure maintains the osmotic balance of a cell?
- 1). Vacuole
 - 2). Ribosome
 - 3). Lysosome
 - 4). Centriole
 - 5). Plasma membrane
6. a. Tubulin b. lignin c. Actin d. Keratin e. Myosin
- Which of the above found in the cytoskeleton?
- 1) a, b, c
 - 2) a, c, e
 - 3) a, c, d
 - 4) c, d, e
 - 5) a, d, e
7. Which one of the following statements regarding enzymes is **incorrect**?
- 1). FAD is needed for some functioning of enzymes
 - 2). Enzymes increase the activation energy of a reaction which acts as catalysts
 - 3). Some metallic ions activate the enzyme reactions
 - 4). Non competitive inhibitors reversibly act on enzyme reactions
 - 5). Beyond an optimum temperature rate of enzyme reaction doubles with every increase of 10°C .

8. Domain Bacteria differs from Domain Archaea. Because Bacterial,
- 1). cell wall consists of lipids that are branched
 - 2). growth are inhibited by antibiotics
 - 3). protein synthesis starts with methionine
 - 4). organelles do not bounded with membrane
 - 5). protein synthesis involved with many RNA polymerases
9. Which of the following statement regarding Kingdom Protista is correct?
- 1). Cellulose and pectin found as cell wall components in phylum Phaeophyta
 - 2). Manitol found in Chrysophyta as storage food
 - 3). Only the reproductive cell contains flagella in Rhodophyta
 - 4). Chlorophyta contains only unicellular organisms
 - 5). Rhizopodes capture food by pseudopodia and having heterotrophic nutrition
10. Which of the following character is only found in mollusks and not found in Arthropods?
- 1). Tentacle
 - 2). Statocyst
 - 3). Gonadal ducts
 - 4). Regeneration
 - 5). Gills
11. Which of the following character **cannot** be used to distinguish a cartilaginous fish from a bony fish?
- 1). Heterocercal caudal fin
 - 2). Opened many gill slits
 - 3). Placoid scales
 - 4). Eye without lids
 - 5). Internal fertilization
12. Which of the following statement regarding nutrients of plants is correct?
- 1). Some inadequate elements to plants are conducted from older to younger tissues through phloem.
 - 2). Deficiency to potassium causes abnormal pigmentation on leaves
 - 3). Insectivorous plants get water and minerals such as nitrogen from the soil
 - 4). Essential elements to plants are only macro elements
 - 5). Trace elements are not very much needed by plants.
13. Which one of the enzymes of human digestive tract is **not** belongs to small intestine?
- 1). Enterokinase
 - 2). Maltase
 - 3). Amino peptidase
 - 4). Chymotrypsin
 - 5). Lipase
14. During the inspiratory process in human,
- 1). internal inter costal muscles contracts
 - 2). volume of the thoracic cavity decreases
 - 3). pressure in between plural cavity increases
 - 4). air exhaust from lungs
 - 5). diaphragm gets flattened
15. The following parts are related to the ventilation process in human.
- a. Inspiratory centre b. Expiratory centre c. Pneumotaxic area d. Apneustic area
- Which of the above get inhibition when the stretch receptors are stimulated?
- 1). a and c
 - 2). a and b
 - 3). a and d
 - 4). c and d
 - 5). a, b and d
16. During at incipient plasmolysis, a plant cell
- 1). has a positive ψ_p
 - 2). has a positive ψ_s
 - 3). has equal values of ψ_w and ψ_s
 - 4). has greater ψ_w than ψ_s
 - 5). has equal values of ψ_p and ψ_w

17. Followings are some events related to phloem transport.

- A. Water diffuse by osmosis from xylem vessels
- B. Sugar transported through mesophyll cells
- C. Sugar move down ward in the stem
- D. Leaf cells produce sugar
- E. Transfer dell upload sugar into sieve tubes

Select the correct sequence regarding phloem transport.

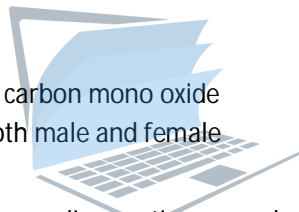
- 1). DBAEC 2). DABEC 3). DEBAC 4). DBEAC 5). DAEBE

18. Which of the following **does not** occur during the contraction of ventricles?

- 1). Opening of semi lunar valves
- 2). Closing of atrio- ventricular valves
- 3). Hearing of first heart sound 'lub' during the opening of semi lunar valves
- 4). Blood in the right ventricle pulled into the pulmonary artery
- 5). Electric stimulation conducted through AV node and bundle of His.

19. Haemoglobin,

- 1).only found in vertebrates
- 2).Mg is essential for its synthesis
- 3).gives carbamino haemoglobin with carbon mono oxide
- 4).found in equal concentrations in both male and female
- 5).deficiency causes anemia



20. Which one of the following statements regarding resting membrane potential of a human motor neuron is **incorrect**?

- 1). It is about -70mV
- 2). It occurs due to the unequal distribution of ions inside and outside of axolemma
- 3). It occurs in the inter nodes
- 4). It can be changed due to the stimulation of axon
- 5). ATP is essential for its maintenance

21. Parasympathetic stimulation,

- 1).constricts the blood vessels in skin
- 2).dilates the blood vessels in skeletal muscle
- 3).constricts the anal sphincter
- 4).reduces sweating
- 5).constricts the iris and reduces the diameter of pupil

22. Which of the following hormone has the least involvement during stress conditions?

- 1). Cortisol 2). Thyroxin 3). Aldosterone 4). Nor adrenalin 5). ACTH

23. Which of the following statement regarding nitrogen wastes is correct?

- 1). Urea is formed during the deamination of proteins
- 2). Bilirubin and Biliverdin are not nitrogen wastes
- 3). Urea and uric acids are excreted by the liver
- 4). In human creatinine is excreted by more than one organs
- 5). Urea is only excreted by kidneys

Follow the instructions for the questions 24-30.

ABD correct;	ACD correct;	AB correct;	CD correct;	Any other responses
1 st answer	2 nd answer	3 rd answer	4 th answer	5 th Answer

24. Which of the following/s **cannot** be the structure/s to plant, animal and prokaryotic cells?
 A. Cytoskeleton B. Plasma membrane C. Peptidoglycan
 D. Peroxisomes E. Flagella
25. Which of the following event /s occur/s in the glycolysis in a living cell?
 A. ATP is synthesized B. NADH is produced C. A four carbon is produced
 D. ATP is utilized E. CO₂ is liberated
26. Which of the following/s structure/s found in all echinoderms?
 A. Water vascular system, larval stages, and endoskeleton
 B. Coelome, gonadal ducts and tube feet
 C. Tentacles, central disc and pedicellariae
 D. Cloaca, pinnulus and arms
 E. Anus, eye spots and respiratory trees
27. Which of the following statement/s regarding fibers in food is/are correct?
 A. They reduce hungry B. They induce peristalsis C. They prevent the gastric disorders
 D. They are needed for metabolism and healthy body E. They prevent gastritis
28. The following characters found in a Chordate animal.
- ◆ Internal fertilization
 - ◆ Horny scales
 - ◆ Nitching membrane
 - ◆ Major nitrogen waste is uric acid
- Which of the following/s can be seen in the above mentioned animal's phylum?
 A. Limbs, cartilage, larval stages
 B. 10 pairs of cranial nerves, four chambered heart, lungs
 C. Three chambered heart, skin without glands, lacks larval stages
 D. Ovovivpariety, egg covered with shell, lungs
 E. Inner and middle ear, lacks teeth, lateral lines
29. Transpiration takes place in a plant body through,
 A. cuticle B. epidermis C. stomata D. lenticels E. cortex
30. Which of the part/s secrete hormones that regulate/s functioning of human kidneys?
 A. Anterior pituitary, hypothalamus, posterior pituitary
 B. Adrenal cortex, parathyroid gland, hypothalamus
 C. Adrenal medulla, testes, ovary
 D. Anterior pituitary, thymus gland, parathyroid gland
 E. Thyroid gland, pancreas, duodenum.



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Part - II

Biology

A. Structured Essay

❖ Answer all questions in this paper itself.

1. A. i). Indicate three features of mono saccharides.

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ii). Name the mono saccharides that make disaccharides.

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iii). a. Give the elemental composition of proteins which is one of the major organic substance in organisms.

.....
.....

b. How the quaternary protein structure is differ from other structural proteins?

.....
.....

c. Indicate an example protein for the following functions:

- 1). Structural
- 2). Catalyst
- 3). Defense
- 4). Storage

iv). Give the bonds found in a quaternary protein structure except the peptide bond.

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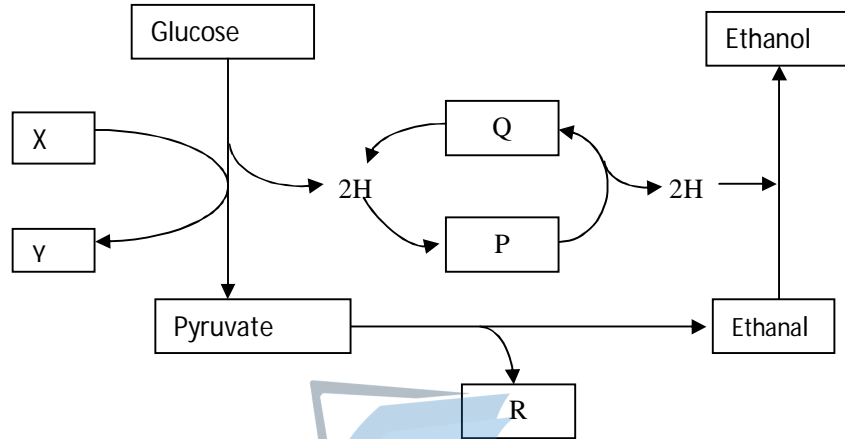
v). A student likes to test a food sample for presence of protein in that food. Give a simple test that could be made in the school laboratory.

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B. i).



a. Identify the above process and name an organism that performs the above.

.....

.....

b. Name P,Q,X and Y in the above process.

P.....

X.....

Q.....

Y.....

c. Identify R and what is the name of its elimination?

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.....

ii). a. Another process occurs without the elimination of R in organisms. Give that name.

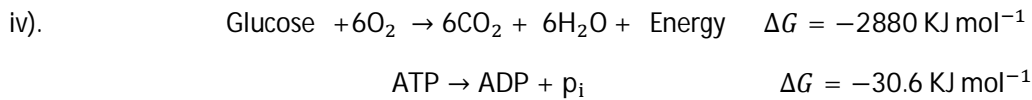
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b. Name two human cells that perform the above process mentioned in (ii.a).

.....

iii). In which compound the final electron acceptor of aerobic respirations are united?

.....



Calculate the energy conversion efficiency of aerobic respiration with number of ATP molecules and above data.

.....

C. i).a. What is meant by the species name of an organism?

.....

b. Write the name of a biologist regarding to the following work.

- 1). Classified plants according to trees and shrubs.....
- 2). After naming of prokaryotic and eukaryotic methods.....
- 3). Classify a higher level over Kingdom.....

ii). Some characters (1-8) related to Kingdom Protista are given below. Place a (v) mark against the phylum/phyla

for the particular character.

	Character	Chrysophyta	Rhizopoda	Phaeophyta	Chlorophyta
1	Starch food storage				
2	No cell wall				
3	Chlorophyll C				
4	Locomotory structure				
5	Pectin				
6	Manitol food storage				
7	Unicellular				
8	No food storage				

iii). A. Annelida B. Platyhelminthes C. Mollusca D. Nematoda E. Arthropoda

Which of the above phylum/phyla contain/s the characters given below.

- a. Well developed coelome
- b. Prominent cephalization.....
- c. No exo or endo skeleton.....
- d. Gills.....
- e. Lacks cilia.....

2. A. i). Symbiotic associations can be beneficial to both organisms or it can be beneficial to one organism, or it can be harmful to one organism. Indicate whether following symbiotic relationships are beneficial (+), harmful (-), do not affect (0) each of the following organism. Mark either +, - or 0 in the cages right to each organism.

	Organism I	Notation	Organism II	Notation
1	<i>Rhizobium</i>		Soya bean	
2	<i>Dentrobium</i> (Orchid).		<i>Dipterocarpus</i>	
3	<i>Necator americanus</i>		Human	
4	Hermit crab		Sea anemone	
5	<i>Loranthus</i>		Mango tree	

ii). What are essential elements to plants?

.....

.....

iii). Given are some essential elements to plants. Indicate one important mode of absorption for each element.

N

P

S

Fe

iv). Give the parts of the human large intestine.

.....

.....

v). Give four components which are absorbed by large intestine.

.....

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B. i). Give the reason for that the expiration is a passive process.

.....

.....

ii). a. Give the locations of the chemo receptors responsible for the control of respiratory process in human.

.....

.....

b. Which blood component is detected by the above mentioned chemo receptors.

.....

iii). Which is the receptor found in the control of respiratory process, that is a non chemoreceptor and state its location

.....

iv). In the respiratory areas of the pons varolli,

a. Which increases the inspiration?

.....

b. Which inhibits the inspiration?

.....

v). a. What is tidal volume?

.....

.....

b. What is residual volume?

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c. What is vital capacity? And what is its volume?

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vi). a. What is the reason for the reduction of gaseous exchange surface when smoking cigarette?

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b. Indicate two disorders in human due to pulmonary hyper tension.

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C. i). a. What is blood pressure?

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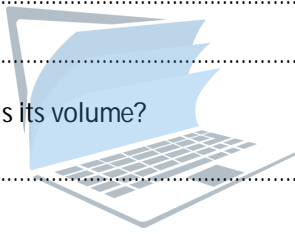
b. Give the two components of blood pressure and indicate the normal values of them.

.....

.....

c. How do you term the difference between the two components you mentioned above (C ib)?

.....



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ii). Indicate four factors that responsible for the maintenance of blood pressure within a normal range.

.....
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iii). a. What is hyper tension?

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.....

b. Write two impacts of hyper tension in human.

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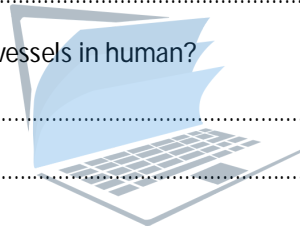
iv). Indicate a diagnostic blood test for the following human diseases.

a. Dengue

b. Typhoid

v). How is lymph transported in lymph vessels in human?

.....
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3. A. i). Give two factors that responsible for the speed of transmission on nerves.

.....
.....

ii). a. What is the functional unit of the nervous system of vertebrates?

.....

b. What is reflex action?

.....
.....

iii). the central nervous system of human is surrounded by three layers of membranes called meninges.

Name them in the order from outer to inner.

.....
.....

iv). Name the parts of the human brain derived from embryonic hind brain.

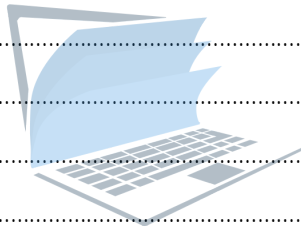
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v). Name the part of the human brain of the following functions.

- a. Controls the sneezing and coughing
- b. Reflex movements of head, neck and trunk
- c. Regulation of body temperature
- d. Initiation of voluntary muscle contraction
- e. Helps to integrate the information travelling up and down
- f. Integrates sensory information and relays it to the higher centres of the brain

B. i) Indicate the characters found in a receptor.

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



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ii). Indicate the stimulation detect by the following receptor or cell.

- a. Meissner's corpuscles
- b. Pacinian corpuscles
- c. Bulbs of Krauses's
- d. Cone

iii). Indicate three photo receptors found in invertebrates.

.....
.....

iv). Give two major disorders found in human eye and indicate a reason for each disorder.

Disorder

Reason

.....
.....

C. i). What is an animal hormone?

.....

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.....

.....

ii). What are the differences found between a hormone and a neuro transmitter ?

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iii). For each of the hormone of human given below state the site of production and **one** main function.

Hormone	Site of production	Main function
a. Growth hormone
b. ADH
c. Cortisol





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Part - II

Biology

B. Essay

Answer any **two** questions.

1. Write an essay on the mechanisms found in C_4 plants for the fixation of carbon dioxide molecules and synthesis of organic food and the essay should include the importance of photo synthesis.
2. Describe the formation of urine in human and the anatomical and physiological adaptations which are found in the nephron for the formation of urine.
3. Write short notes for the followings:
 - a. Importance of water to living organisms
 - b. Electro cardio gram (ECG)
 - c. Impulse transmission at a synapse.



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