

## Biology

### Grade 13 1<sup>st</sup> Term Test



Part I

Time 2 hours

Answer all questions.

- Which of the following compounds does not contain glucose as a component molecule?  
1 sucrose      2 starch      3. Glycogen      4. Lactose      5. inulin
- Peptide bonds are not found in  
1 .Histone      2. Casein      3. Heparin      4.insulin 5. Lysozyme
- Which of the following is incorrect regarding cellular respiration?
  - Oxidation and decarboxylation take place in the formation of Acetyly Co – enzyme A
  - One ATP molecule , three NADH molecule and one FADH<sub>2</sub> molecule are produce in Krebs cycle per one glucose molecule.
  - The energy released in oxidation of co- enzymes is stored in ATP in oxidative phosphorylation.
  - Ethanol is formed by the carboxylation of pyruvate in the absences of O<sub>2</sub> in *Saccharomyces* cells
  - Fatty acids and glycerol enter the Krebs cycle after converting them into carboxylic acids.
- Select the incorrect statement about meiosis .
  - Chromosomes are separated during the Ana phase
  - Chromosomes are condensed during the Pro phase
  - Chromosomes are repelled during the Pro phase
  - Chromatids are formed during Inter phase
  - One spindle fibre is attached to the chromatid during the Meta phase
- Select the increasing order of the size of the given structures  
a- Proteins      b- Ribosomes      c- *Paramecium*      d- Human egg cell
  - a,b,c,d      2. a,c,b,d      3. a,b,d,c      4. d, b,c,a      5. d,c,b,a
- photorespiration is
  - production of chemical energy as ATP by using light energy
  - O<sub>2</sub> is the final electron acceptor
  - Fixation of CO<sub>2</sub> by using energy that is produced in light reaction
  - Formation of 3C compound and 2C compound due to binding of O<sub>2</sub> with RuBP
  - A process of cellular respiration which can be found only in photosynthetic organisms

7. Select the factor/s which are / is important for maintaining blood pressure within normal limits
- a. Cardiac - output    b. gender    c. blood volume in blood vessels    d. activity    e. posture
1. a,b,d    2. a,c    3. a, d,e    4. a,d    5. a, b,c,d

8. Factors which should be controlled in the internal environment of human body

1. Relative amounts of solutions in blood, concentration of chemical constituents ,body temperature
2. Glucose concentration ,Na ion concentration ,body temperature
3. Concentration of hormones ,concentration of chemical constituents ,body temperature
4. Concentration of chemical constituents , body temperature ,CO<sub>2</sub> concentration
5. Blood pH level , glucose concentration , relative amount of water in blood

9. Select the correct statement about the excretory substances

1. Energy is not needed for the synthesis of NH<sub>3</sub>
2. Urea is more water soluble than NH<sub>3</sub>
3. Uric acid is the excretory substance in amphibians and reptiles
4. Creatinine is formed in liver
5. Kidneys do not involved in the excretion of bile pigments

10. Select the incorrect statement about the excretory structures of animals

1. Flat worms have singled cell structure call flame cells
2. Insects have malphigian tubules ,which are blindly end tubules
3. Prawns possess pair of green glands ventral head either sides of the glosopharynx
4. Nephridia in earth worms are multicellular tubular structures
5. Salt glands are found in marine reptiles ,closer to their ear.

11. In which of the following methods , does the fructose enters into the epithelia cells of small intestine

1. Simple diffusion
2. Osmosis
3. Passive transportation via carriers
4. Active transport
5. None of the above methods

12. Select the incorrect statement about surfactants

1. It is a mixture of phospholipids and lipoproteins
2. It prevents the collapse of alveoli
3. Important in the dilation of lungs
4. These further increase the flow of interstitial fluid into alveoli when the pressure decreases in lungs.
5. Surfactant is also present in alveolar ducts.

13. Which of the following /s has/have haploid set of chromosomes

- a. Pollen tube of Anthophyta
- b. Nucellus of gymnosperm
- c. Archegonium of *Pogonatum*
- d. Antheridium of *Selaginella*
- e. Micro sporangium of gymnosperms

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

14. incorrect statement about the human pancreas

- 1. It is formed by lobules
- 2. Lobules contain alveoli
- 3. Pancreatic juice is an alkaline fluid
- 4. It connects with the duodenum through the pancreatic duct
- 5.  $\beta$  cells of islets of Langerhans secrete insulin



15. Incorrect statement about pollination

- 1. In *Oryza* seeds are usually produced by self pollination
- 2. Cross fertilization is a result of cross pollination
- 3. Double fertilization does not take place in monocotyledonous plants
- 4. Cross fertilization allows shuffling of genes within a species.
- 5. In some plants self sterility prevents germination of pollen on the stigma of the flower.

16. Select the correct sequential order of the steps of micropropagation.

- a. Preparation of a suitable culture medium under sterile condition.
- b. Induction of roots
- c. Acclimatization of plant
- d. Preparation of a suitable explants
- e. Induction of shoots and multiplication of shoots

1. a,d,b,c,e      2. d,a,e,b,c      3. a,d,b,e,c      4. d, a,b,e,c      5. a,d,e,b,c

17. The in correct statement regarding placenta.

- 1. It is a disc shaped organ composed of cells derived from mother and foetus
- 2. Arise from chorine , allantois and uterine wall
- 3. Maternal and foetal blood do not mix and exchange of materials occur by diffusion and active transport.
- 4. Human placental lactogen stimulates milk production from milk glands and release of milk from ducts
- 5. From the foetus , water, urea, CO<sub>2</sub> and hormones passes to the maternal blood

18. Which of the following events does not take place in relation to hormonal changes in menstrual cycle of a woman.
1. GnRH stimulates the anterior pituitary to secrete FSH and LH
  2. FSH stimulates the secretion of Oestrogen from developing follicles
  3. Oestrogen stimulates the rise of blood LH level
  4. Secretion of LH from anterior pituitary is inhibited by increased level of progesterone in blood
  5. The stimulation of mucus secreting glands in uterine wall to secrete mucus is stimulated by Oestrogen
19. Select the incorrect statement regarding the different parts of human male reproductive system and their functions.
1. Vas deference – storage and transportation of sperms
  2. Urethra - Transport of urine and semen
  3. Ejaculatory ducts - fuses with vas deference and forms the urethra
  4. Epididymis - physiological maturation of sperms
  5. Testes – production of sperms
20. Select the correct pair
1. Secretin – increasing of blood  $\text{Na}^+$  level and water level
  2. Erythropoietin – stimulation of production of bile from liver
  3. Aldosterone – stimulation of the production of red blood cells at bone marrow
  4. Thyroxin – increases the basal metabolic rate
  5. Enterogasteron – increasing the speed of emptying of stomach
21. Select the correct pair of vegetative propagating organ and the example
- |            |   |                 |                      |   |                    |
|------------|---|-----------------|----------------------|---|--------------------|
| 1. Rhizome | - | <i>Hibiscus</i> | 4. Adventitious buds | - | <i>Musa</i>        |
| 2. Bulbs   | - | <i>Crinum</i>   | 5. Bulbils           | - | <i>Bryophyllum</i> |
| 3. Corm    | - | <i>Allium</i>   |                      |   |                    |
22. Select the false statement about the nutrition in early neonatal stage.
1. At the age around 6 months semisolid food should be introduced
  2. At the age around 2 months infant can be fed by fruit juice at least 4 times
  3. By the age of 2 years, the child should be trained to feed on the usual diet of the other members of the family
  4. Until the age two years, breast feeding should be continued
  5. Rice, potatoes and cereals can be used to prepare semisolid food



23. Which is not a use of plant tissue culture?

1. Micro propagation
2. Cryopreservation of germ plasma
3. Produce genetically modified plants
4. Produce disease free progeny than their parental generation
5. To obtain haploid plants.

24. Select the correct order of the stages of life cycle of *Selaginella*.

P- formation of sporophyte                      Q – meiosis                      R – Formation of gametophyte

S - development of sporangium                      T – formation of spores

- |              |              |              |
|--------------|--------------|--------------|
| 1. S,P,Q,R,S | 3. P,Q,R,S,T | 5. P,S,Q,T,R |
| 2. S,Q,T,P,R | 4. P.Q.R.T.S |              |

P S Q T R P S Q

25. Select the correct statement about structure and the function of skeletal muscle

1. actin filaments are sliding over myosin filaments in muscle contraction
2. Myosin heads attached binding sites of actin filaments forming the cross bridges
3. when contraction occurs ,length of I band and A band get shorter
4. ATP is not needed for detachment of myosin heads
5. The cross bridges of myosin heads tilt outwards the sarcomere

26. Select the correct statement

1. Primary spermatocytes are found more closely to the centre of seminiferous tubules than secondary spermatocytes.
2. The funnel like proximal end of the fallopian tube with ciliated epithelium connect with uterus.
3. If spermatogenesis proceeds too rapidly , sertoli cells reduces the secretion of FSH
4. Inside the perivitelline space is the cellular zona pellucida prevents polyspermy
5. The secretion of seminal vesicles contains fructose , vitamin E and prostaglandin

27. Which of the followings shows the substances exchange from mother to foetus and vice versa through placenta.?

1. Glucose , amino acids
2. Water , hormones
3. Vitamins , some proteins
4. CO<sub>2</sub> ,Oxygen
5. Mineral ,urea

28. Correct regarding protein synthesis.

- ✓ 1. M-RNA move along the ribosome joining relevant amino acid
- ✗ 2. Always only one gene participates for one protein
3. Two t-RNA molecules can combine with m-RNA at once
4. Start and stop codons of proteins synthesis are AUG and UGG
5. Initial part of m-RNA connects with large subunit of ribosome during translation.

29. Correct statement about parthenocarpy

1. Produce infertile seeds
2. This process naturally occurs in grapes
3. Fruit is developed without fertilization
4. This condition is induced by growth substances in banana plants
5. Seeds can't produced fertile offsprings

30. Incorrect statement about enzymes

1. FAD is tightly bound with enzymes
- ✓ 2. NADP acts as an electron carrier
- ✓ 3. Since the sulfonamide resembles with the substrate structurally it binds with the active site of enzymes
4. Cyanide ions bind with the metal ion of enzyme . Therefore it is an irreversible inhibitor.
5. Heavy metal ions binds permanently with the - SH group of the enzymes.

31. Which of the following statement is incorrect regarding thiamin ?

1. It is important in metabolism of fats
2. It nourishes the nerve cells
3. It maintains the osmotic balance of cells
4. It produces Acetyl co enzyme A
5. It increases the appetite on food

32. Following features could be observe in an organism living in a marine environment ,

- |                               |                  |
|-------------------------------|------------------|
| a) Long cylindrical soft body | c) Lack of shell |
| b) Tentacles                  |                  |

The class into which the above organisms may belong to

- |                |                   |
|----------------|-------------------|
| 1. Hirudinea   | 4. Hohlothuroidea |
| 2. Scyphozoa   | 5. Crinoidea      |
| 3. Cephalopoda |                   |

33. Some features that can be observed in the organism belong to the classes of phylum Chordata are given below.

- (a) Skin with cteneoid scales
- (b) Large lateral eyes with eyelids and a nictitating membrane
- (c) Adults excrete urea, and larvae excrete NH<sub>3</sub>
- (d) Ventral mouth and teeth with enamel
- (e) Four chambered heart

Select the correct order of the classes of the organisms relate to the above features

- 1. Chondrichthyes, reptilia, Osteichthyes, Amphibia, Aves
- 2. Osteichthyes, Reptilia, Chondrichthyes, Amphibia, Aves
- 3. Osteichthyes, Aves, Amphibia, Chondrichthyes, Reptilia
- 4. Chondrichthyes, Aves, Amphibia, Osteichthyes, Reptilia
- 5. Osteichthyes, Reptilia, Amphibia, Chondrichthyes, Aves.

34. A description regarding nerve impulse transmission via a synapsis is given below

- a) Transmission of action potential into pre synaptic membrane
- b) Release acetylcholine
- c) Break down of Acetyl choline- receptor complex
- d) Occurrence of the action potential in post synaptic membrane
- e) Diffusion of acetyl choline into the post synaptic membrane

*a b e d c*

Select the correct order of transmission of nerve impulse

- 1. badec
- 2. abedc
- 3. abcde
- 4. bdcea
- 5. ebcda

35. Reflex arc of human is,

- 1. Consist of two neurons
- 2. Always starts from skin
- 3. Always travel through central nervous system
- 4. Cell body of its all neurons are in a grey matter
- 5. Always ends in a skeletal muscle

36. Which of the following statement is incorrect regarding respiratory pigments?

1. The respiratory pigment haemocyanine contain  $\text{Cu}^{2+}$  .
2. Iron is the metal group present in both haemoglobin and haemoerythrin
3. Respiratory pigment haemoglobin is present in the blood cells of chordates
4. Respiratory pigment haemoglobin is present only in chordates
5. Respiratory pigment haemocyanin is present in non chordates

37. which of the following is incorrect about human liver ?

1. It is the largest gland of the body
2. Hepatocytes are the functional units of liver
3. Bile duct is located between the rows of hepatocytes
4. Important for the detoxification of nicotine
5. Helps to store iron

38. The group of enzymes that can be produced using *Aspergillus niger*

1. Amylase , invertase
2. Prtoesae , cellulase
3. Lipase , protease
4. Cellulase ,lipase
5. Glucose oxidase ,cellulase

39. Bioremediation is not used currently in,

1. Acceleration waste water decomposition
2. Removing toxic metals from metal industry waste
3. Accelerating the composting process
4. Copper extraction from metal ores.
5. Removing oil spills from aquatic environment

40. Select the correct statement regarding the casparian strip in the endodermis of a plant root

1. It blocks the symplast pathway
2. It is highly lignified
3. Absent in passage cells
4. Prevents the entry of water into plants
5. Casparian stripes are only derived during the secondary growth of plant



Answer questions 41 to 50 using the given information.

1	2	3	4	5
A,B and D correct	A,C and D correct	A B correct	CD correct	Other combination

41. Correct statement/s regarding human inner ear

- A. It is located within temporal bone
- B. Endolymph is present in its bony labyrinth
- C. Semicircular canals and vestibule contribute in equilibrium
- D. Organ of Corti of cochlea is important for the hearing
- E. Nerve supply is by the ninth cranial nerves



42. Correct statement/s about plant tissues

- A. Xylem vessels living cells
- ✓ B. Major component of the cell wall of sclerenchyma tissue is lignin
- C. Irregular cellulose thickening are present in the secondary cell wall of collenchyma
- ✓ D. Food storage is a main function of parenchyma tissue
- E. Dicot plant roots lack collenchyma

43. Correct statement about root pressure

- ✓ A. Can be easily identified in plants with hydathodes
- B. Occurs mainly in day time
- C. Important in transportation of water in tall plants
- D. Occurs due to positive pressure potential created in the xylem of root
- E. Absent in herbaceous plants

44. Incorrect statement about collecting ducts of human kidney

- ✓ A. It is a part of nephron
- B. Large portion of it is located in medulla
- C. Few collecting ducts together form renal pyramids
- ✓ D. A large number of nephrons are connected with one collecting duct
- ✓ E. It absorbs water in the presence of ADH

45. Correct statement regarding glycolysis of aerobic cellular respiration

- A. Energy products are 2NADH and 2ATP
- ✓ B. Occurs in the cytoplasm of all organisms
- ✓ C. ATP is produced by oxidative phosphorylation.
- D. Every reaction is catalyzed by enzyme
- E. One glucose molecule is converted into a pyruvate molecule

46. Correct statement / s about human skin.

- ✓ A. Epidermis is made by 3 cell layers
- ✓ B. Epidermis has non-keratinized epithelium
- C. Sebaceous glands secretions protect the skin by bacterial infections
- D. Sweat glands are important for thermoregulation and excretion
- E. Merkel discs are sensitive to vibrations

47. Correct statement about the physiology of neuron

- ✓ A. Inside the axon is negatively charged than the extra cellular fluid
- ✓ B. Resting potential of neuron is about -70 mv
- ✓ C. The action potential is a self-propagating wave of depolarization that travels down the length of the axon
- D. Action potential is completely maintained actively
- E. Action potential is not generated until the voltage reaches a certain critical point.

48. Plant growth substances which are transported via parenchyma cells

- |              |                   |
|--------------|-------------------|
| A. Auxin     | D. Abscisic acids |
| B. Ethylene  | E. Gibberellins   |
| C. Cytokinin |                   |

49. select the correct statement about endocrine secretion

- A. Erythropoietin - Induce release of red blood cells to the blood
- B. Cortisol - Induce break down of proteins
- C. Parathormone - increase  $PO_4^{3-}$  level in blood
- ✓ D. Oxytocin - Induce ejection of milk
- ✓ E. Noradrenalin - Dilation of small blood vessels

50. False statement about fungi

- A. Asexual reproduction of chytridiomycote is done by flagellated zoospores
- ✓ B. Zygosporangium is produced in the sexual reproduction of *Mucor*.
- ✓ C. Basidiomycetes produce basidiospores in sexual reproduction
- ✓ D. *Allomyces* do not show sexual reproduction
- ✓ E. Ascomycota contain branched and septate fungal



De Mazenod College - Kandana  
Biology - Grade 13  
1<sup>st</sup> Term Test - November 2016

Time 3 hours

Structured Essay.

I. A)

i. What do you meant by substrate specificity of an enzyme ?

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.....

ii. How substrate specificity is occurred in enzymes?

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.....

iii. What is the mechanism that explains the substrate specificity of an enzyme ?

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.....

iv. Explain how does the above given hypothesis explains the mechanism of substrate specificity of enzymes.

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

v. Write five factors that affect on the rate of enzymetic reaction.

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.....  
.....

vi. Explain how do you demonstrate an experiment to show an activity of an enzyme in your school laboratory using the given materials

- Germinating Mung seeds
- Dilute starch solution
- Dilute sucrose solution
- Benedicts solution
- Other materials which you need

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B)

i. What do you meant by matured plant cell?

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ii. When matured cell is immersed in hypotonic solution , state the changes that take place in correct order.

.....

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.....

iii. What do you meant by turgid state of a mature plant cell?

.....

iv. a) When is the above mentioned cell achieves  $\Psi_w = \Psi_s$  state?

.....

b) Explain how turgid cell achieves incipient plasmolysed state ?

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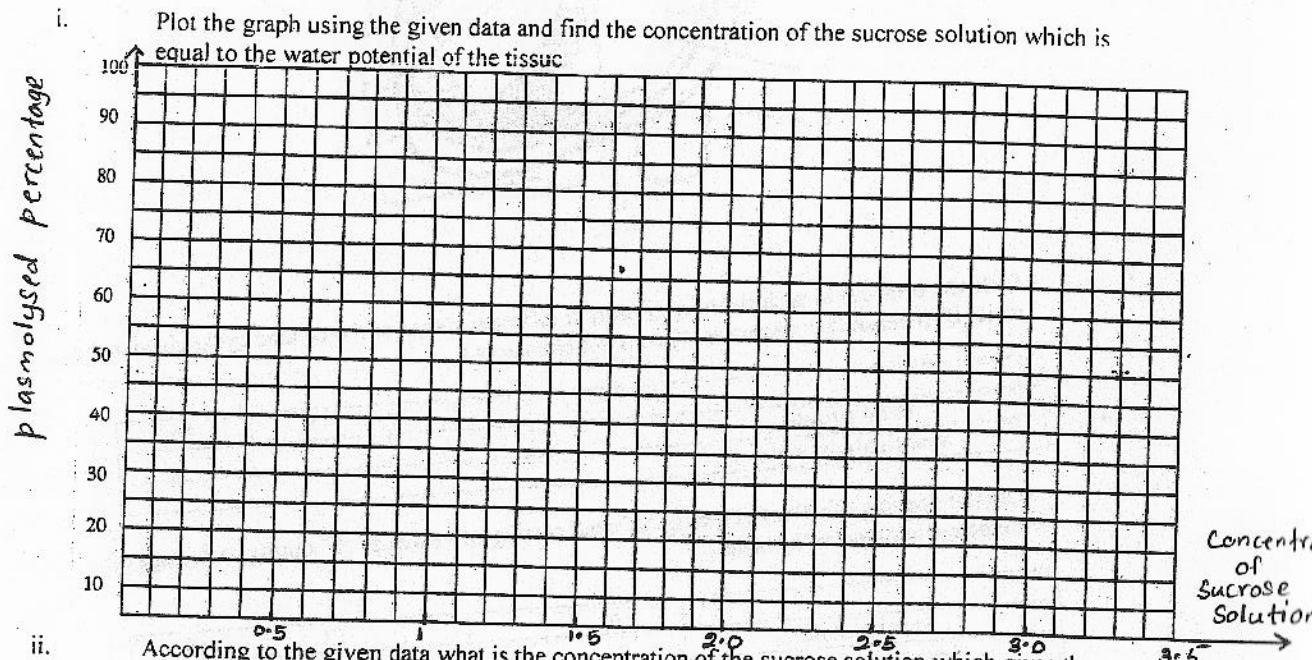
C)

When lower epidermal tissues of *Rhoeo* leaves were immersed in sucrose solutions of different concentration for 30 minutes and microscopic count of plasmolysed cells is given in the tables as a percentage according to their concentration.

Molarity of the sucrose solution (M)	Percentage of plasmolysed cells
0.5	3
1.0	15
1.4	60
2.0	80
2.5	85
3.0	90
3.5	100

Following table gives you the solute potential of solution with different molarities.

Molarity of the sucrose solution (M)	Solute potential kPa
0.5	-260
1.0	-540
1.4	-820
2.0	-1120
2.5	-1450
3.0	-1800
3.5	-2000



ii. According to the given data what is the concentration of the sucrose solution which gives the incipient plasmolysis ?

.....

iii. What is the water potential of the cell at incipient plasmolysed state ?

.....

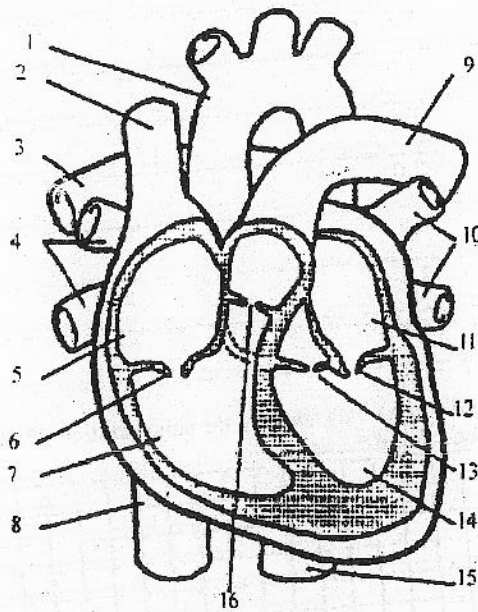
iv. What is the water potential of the tissue which was immersed in 2.0 M sucrose solution?

.....

v. What can you say about the solute potential of the cell that immersed in 2.0 M sucrose solution, is it greater, lesser or equal ?

.....

Answer the questions vi – viii using the given diagram of human heart.



vi. State the pressure in each chamber of heart at different stages of the cardiac cycle given in the table. If increase (↑) decreases (↓) does not change (=)

	5	7	11	14
Atrial systole				
Ventricular systole				

vii. State the opening of valves of heart as 'O' and closing of valves as 'C' during each stage of cardiac cycle given in the table.

	6	12	13	16
Atrial systole				
Ventricular systole				
Complete diastole				

viii. Write the number/s that are suitable for the given description .

- a. Location of pace maker of heart .....
- b. Blood pressure is determined due to constriction of .....
- c. QRS complex of an ECG is due to closing of ..... valve.

2. A )  
i. State the distribution of soil micro – organisms.

.....

ii. Explain the reason for the above distribution.

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.....

iii. Name the two main methods that soil get mineral nutrients.

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.....

iv. What do you meant by mineralization ?

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

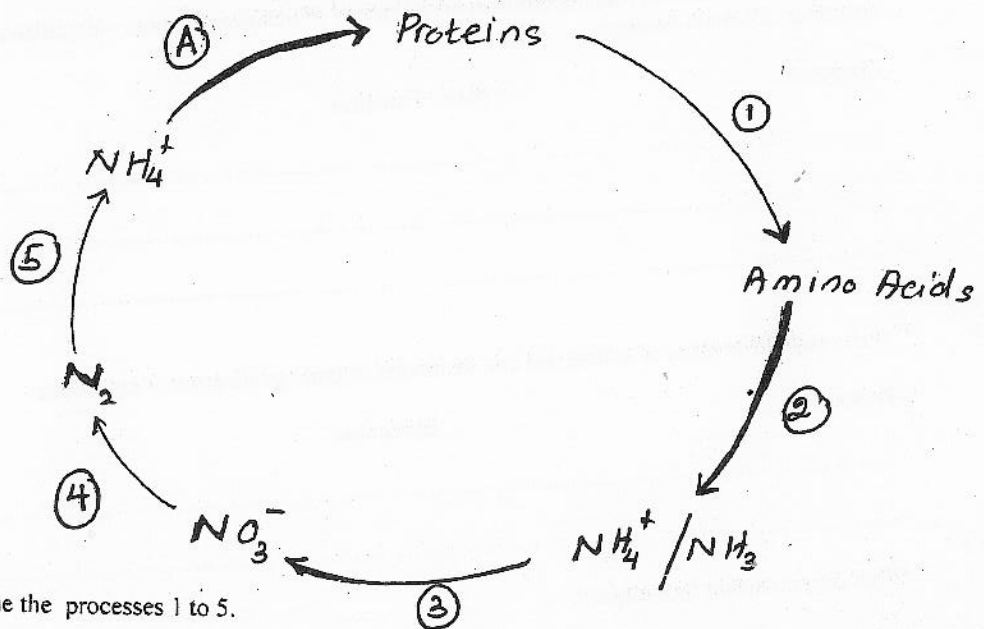
v. What are soil aggregates?.

.....  
.....

vi. Name three types of micro – organisms that contribute to form soil aggregates.

.....  
.....

vii. Answer following questions using the given Nitrogen cycle.



a. Name the processes 1 to 5.

1. ....  
2. ....  
3. ....

4. ....  
5. ....

b. Name two micro – organisms that involved in each of the above processes.

Process	Micro – organism
.....	.....
.....	.....
.....	.....
.....	.....

c. Basically what happen at step 'A'?

.....

B)

i. Explain the following terms about pathogenic micro – organisms.

a. Pathogenicity

.....

b. Toxiogenicity

.....

c. Invasiveness

.....

.....

.....

ii. Name three exotoxins that important in invasiveness of pathogenic micro – organisms and mention it's main function.

Enzyme

Main Function.

.....

.....

.....

C)

i. Write two differences of endotoxins and exotoxins of pathogenic micro – organisms.

Endotoxins

Exotoxins

.....

.....

3. A)

i. What do you meant by synapse?.

.....

.....



ii. Name three types of synapses?

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

iii. State the location of synaptic cleft.

.....

iv. Name the neurotransmitters that important to transmit impulses across the synaptic cleft.

.....

v. a.) Name the neurotransmitter that released by motor neuron.

vi.

b.) How does the above neurotransmitter is removed after releasing?.

.....

vii. What are the factors that affect on transmission of nerve impulses?.

.....

viii. Why neurotransmitters do not consider as hormones?.

.....

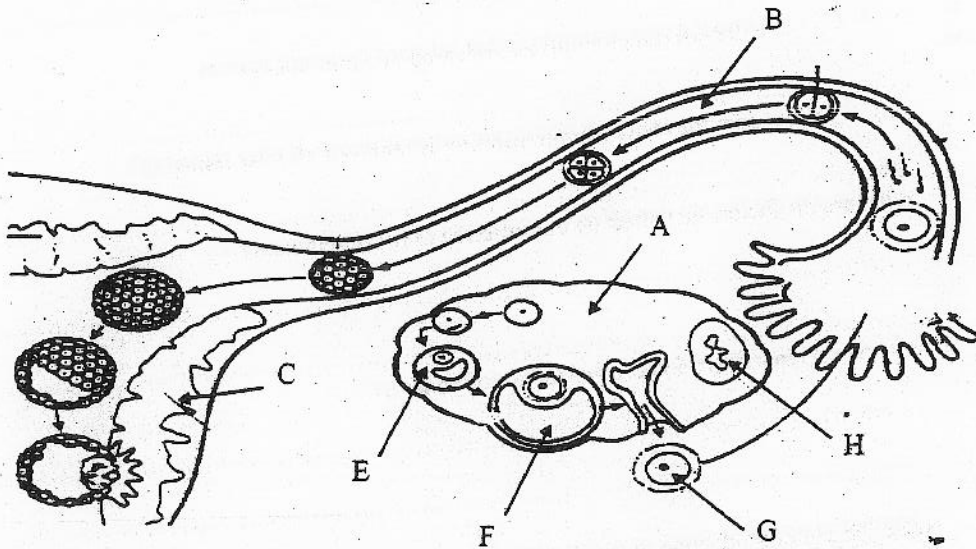
B)

i. Name the site of production of the given hormones and their main function

Hormone	Site of production	Main function
TRH		
ACTH		
Growth hormone		
Cortisol		
Glucagon		

- ii. Name three trophic hormones that control the menstrual cycle of women.  
 .....
- iii. Name a hormone that acts only on bones of human body.  
 .....
- iv. Name two vitamins and two elements that are required for the good health of bones.  
 Vitamins ..... Elements .....

C). Following is a diagram of female reproductive system.



i. Name the parts from A to H.

- A .....  
 B .....  
 C .....  
 D .....  
 E .....  
 F .....  
 G .....  
 H .....

ii. Name four parts of the structure G and mention their main function.

Structure/part	Main function
.....	.....
.....	.....
.....	.....
.....	.....

iii. Name the hormones secreted by E and H.

- E - .....  
 H - .....

iv. Name two viral disease the can be transmitted to embryo through maternal blood.

.....

4. A )

i. Name two organic substances present in secondary cell wall of plant cells other than cellulose and give one cell type where those substances are found.

Organic substance

Example

.....

.....

.....

.....

ii. Write two functions of plant cell wall.

.....

.....

iii. Explain why the structure of cell membrane is explained as Fluid mosaic model.

.....

.....

iv. Write three functions of cell membrane.

.....

.....

.....

v. Explain the steps to prepare a slide to observe an epidermal peel of Onion bulb under light microscope.

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B)

- i. Name the two processes of production of ATP in complete oxidation of glucose molecule, and write the site of occurrence and number of ATP molecules that are produced at each process.

Synthesis process of ATP	Location	Number of molecules

- ii. Name two main products of electron transport chain in aerobic respiration.

.....

- iii. What is the main function of H<sub>2</sub>O in light reaction of photosynthesis?

.....

- iv. State the relationship between absorption spectrum of photosynthesis and action spectrum.

.....

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.....

.....

C)

- i. What do you mean by natural classification of organisms?

.....

.....

- ii. What is the contribution of Ernest Haeckel regarding classification of organisms.

.....

.....

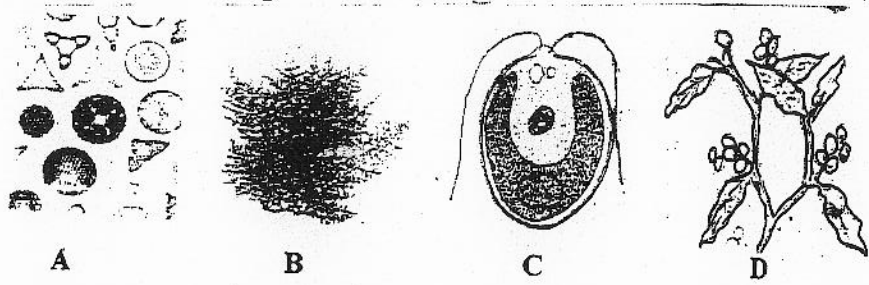
- iii. Write two common features where both Domain Eukarya and Domain Archea show but not in Domain Bacteria.

.....

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.....

iv. Answer the questions using the given diagrams.



- a. Name a structural feature of organism B that it differ from all the others.
- b. Name a structural and functional feature that are common to both Phylum Ciliophora and Phylum Rhizopora but not found in A, B, C and D

Functional feature .....

Structural feature .....

- c. Name the storage food in A, B and C

A. ....

B. ....

C. ....

### Essay Questions.

1. Explain the gross structure of human kidney. Explain the functions of human kidney in homeostasis other than production of urine.
2. What do meant by homeostasis?. Explain the function of hypothalamus in maintaining homeostatis.
3. Explain the defensive mechanisms in human body.
4. Explain the structure of human ova and sperm according to it's function.
5. i. Explain the function of light in photosynthesis.  
ii. Explain how C4 photosynthesis is more efficient than C3 photosynthesis.
6. Write short notes.
  - a. Pressure flow hypothesis.
  - b. Phosphorylation.
  - c. Human cochlear