Sixth Term Examination – 2022

Conducted by

Field Work Centre, Thondaimanaru.

FWC

Biology - I	Time: Two Hours	09	E	I
	Gr -13 (2022)			

- Answer **all** questions.
- In each of the question 1-50, pick one of the alternatives from **(1), (2), (3), (4), (5)** which is **correct** or **most appropriate** and mark your response on the **answer sheet** with a **cross (X)** on the number.

01) Character of water as a habitat for some organisms.
(1) High specific heat (2) High surface tension (3) Expansion upon freezing
(4) High heat of vaporization (5) Polarity

02) Carbohydrates
(1) contain a general molecular formula $(CH_2O)_2$
(2) contain the proportion of $H:O = 1:2$.
(3) found only in plants as storage component.
(4) make structural component in the body of some animals.
(5) include the major groups as monosaccharides and polysaccharides.

03) A. Production of steroids.
B. Production of cellulose and pectin.
C. Detoxification of peroxides.
D. Helps in digestion.
Functions of smooth endoplasmic reticulum and Golgi apparatus respectively.
(1) D, B (2) C, A (3) A, B
(4) D, C (5) A, D

04)
a. Duplication of centrosomes.
b. Chromosomes become less condense to form chromatin
c. Formation of mitotic spindle.
d. Cell elongates as the non-kinetochore microtubules are lengthen.
e. Chromosomes move back and forth.

The above are events of a eukaryotic cell cycle.
Correct sequence of the above.
(1) a, b, d, e, c (2) a, c, b, d, e (3) b, a, c, e, d
(4) c, a, d, e, b (5) a, c, e, d, b

05) Which one of the following statements is correct regarding enzymes?
(1) Some enzymes alter the nature of the of end products of reaction.
(2) Inhibitors bind with enzymes reversibly by covalent bonds.
(3) ATP acts as an allosteric inhibitor to some enzymes.
(4) Some non-competitive inhibitors bind with the active site of the enzyme.
(5) The active site of enzymes is made up with many amino acids.

06) Photorespiration
(1) is a process of consuming CO_2 and releasing O_2.
(2) takes place only in C 3 plants.
(3) is a useful process to plants.
(4) is an energy generating process.
(5) occurs only in mitochondria and peroxisomes.

07) Compound that receives the hydrogens released in cellular respiration.
(1) FAD (2) Oxaloacetate (3) Citric acid
(4) ADP (5) $NADP^+$

08) Correct statement regarding evolution of biological diversity.
(1) Proteins found into the protocell acted as biochemical catalysts.
(2) Atmospheric conditions of early facilitated the biotic synthesis of small organic molecules.
(3) Protocell contains DNA molecules which gained self-replicating capability.
(4) Early atmosphere does not contain any compounds of oxygen.
(5) Observation and experiments in chemistry, geology and physics have provided evidence, for the appearance of the first living cells.

09) Each of the following features can be seen in some of the groups of Kingdom Plantae.
A. Heterosporous.
B. Presence of xylem vessel elements.
C. Dominant gametophyte.
D. Need of external water for fertilization.
When each of the above features are arranged as seen only in **one, two, three** and **four** groups of Kingdom Plantae. The correct sequence is
(1) BCAD (2) CABD (3) CBDA
(4) CBAD (5) ABDC

10) Nematodes
(1) are bisexual animals.
(2) most of them are parasites.
(3) have locomotory structures.
(4) have segmented body.
(5) have thick cuticle.

11) Water moves in the apoplastic path way
(1) only by diffusion. (2) by diffusion and osmosis.
(3) by osmosis and bulk flow. (4) by bulk flow and diffusion.
(5) only by osmosis.

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12) Elements that show deficiency symptom as wilting
(1) H and Cl (2) Zn and Fe (3) H and Cu
(4) Cl and S (5) K and P

13) *Nephrolepis* is differs from *Sellaginella* because of
(1) containing heteromorphic alternation of generations.
(2) containing dependent embryo.
(3) containing monoecious gametophyte.
(4) containing multicellular gametangia.
(5) containing gametophytes that are microscopic.

14) Biotic stress which would be included in the induced structural and chemical defense mechanism.
(1) Nicotine (2) Trichome (3) Azadirectin
(4) Abscission layer (4) Lignin

15) A common function both to epithelial and connective tissue.
(1) Secretion (2) Defense (3) Absorption
(4) Support (5) Insulation

16) One of the target organs of cholecystokinin
(1) Liver (2) Duodenum (3) Large intestine
(4) Stomach (5) Jejunum

17) Cannot be find in open circulatory system and can be find in closed circulatory system.
(1) Heart (2) Ostia (3) Anterior vessels
(4) Respiratory pigments (5) Capillaries

18) Last wave of an ECG denotes
(1) the depolarization of atrium. (2) the repolarization of ventricle.
(3) the complete relaxation of heart. (4) the rhythm of heart beat.
(5) the impulse conduction from AV node.

19) Correct statement regarding human respiratory system.
(1) Pulmonary arteries carry oxygenated blood.
(2) During inhalation, fresh air mixes with the stale air in the lungs.
(3) The net diffusion od CO_2 takes place from the alveoli to the blood.
(4) Partial pressure of O_2 is higher in alveolar capillary blood than that of alveolar air.
(5) No need of energy for the mechanism of ventilation in lungs.

20) Correct statement regarding immunity in animals.
(1) Innate immunity is found only in the invertebrates.
(2) Histamine is one of the antimicrobial proteins.
(3) Natural killer cells can release chemicals to kill the cancerous cells which could inhibit further spread of that cell.
(4) In mollusks, T-memory cells provide response to the subsequent encounter of microbial infections.
(5) Interferons can be contributed to the adaptive immunity.

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21) Which of the following animal- excretory product combination is correct?
(1) Shark – ammonia
(2) Land snail - urea
(3) Toad – uric acid
(4) Tadpole - ammonia
(5) Grass hopper - ammonia

22) Select the correct statement regarding human brain.
(1) Mid part of the brain stem is the mid brain.
(2) Corpora quadrigemina joins the two cerebral hemispheres.
(3) There are three ventricles present in the fore brain.
(4) Thalamus controls the autonomous nervous system.
(5) Cerebellum controls the voluntary muscles.

23) Of the following human hormones which can make both negative and positive effects.
(1) Estradiol (2) Oxytocin (3) GH
(4) LH (5) GHRIH

24) Select the correct statement regarding the female reproductive system.
(1) Morula, an embryonic stage is implanted at the seventh day.
(2) At birth, the ovaries together contain around two million secondary oocytes.
(3) Endometrium consists of smooth muscle layers.
(4) The luteal phase of the ovarian cycle is coordinated with the secretary phase of the menstrual cycle.
(5) The endometrium of the uterine wall is thickened by LH that is secreted by growing follicles.

25) In the third trimester,
(1) mother may be feeling the fetal movements first.
(2) most of the fetal organ system become fully functional.
(3) fetus grows to about 30 cm in length.
(4) heart begins to beat in the fetus.
(5) wight of the fetus around 2 – 4 kg.

26) Correct statement regarding skeleton of animals.
(1) Exo skeleton of Arthropods is made up only with chitin.
(2) Only bony skeleton found in Chordates.
(3) Only endoskeleton found in Echinodermates.
(4) Only the Mollusks that contains animals with exoskeletons.
(5) The animals that contain hydrostatic skeletons show rapid movements.

27) Contribution of axial skeleton to the upright posture.
(1) The size of the vertebral foramen of vertebrae become larger.
(2) Presence of a triangular shaped sacrum which is made up from a single bone.
(3) Presence of two secondary curvatures in the vertebral column.
(4) Presence of weightless thoracic cage and sternum.
(5) Presence of facets in the thoracic vertebrae.

28) Genetic makeup of an organism is
(1) genotype. (2) phenotype. (3) homozygous state.
(4) heterozygous state. (5) factors.

29) In the F2 of a dihybrid cross involving two independently assorting genes, what proportion of the offspring will be true breeding?

(1) $\frac{1}{16}$ (2) $\frac{3}{16}$ (3) $\frac{9}{16}$
(4) $\frac{4}{16}$ (5) $\frac{2}{16}$

30) An enzyme that facilitates the action of DNA polymerase in DNA replication.

(1) DNA ligase.
(2) Helicase.
(3) Primase.
(4) Topoisomerase.
(5) Restriction endonuclease.

31) Correct regarding down syndrome.

(1) It is a syndrome of monosomy.
(2) This is caused by nondisjunction in meiosis I.
(3) The risk of having this syndrome increases with the age of the father.
(4) This is a trisomy with the additional chromosomes.
(5) Almost all females with this syndrome are sexually under developed.

32) Reason for using Taq. DNA polymerase in PCR machinery.

(1) It can only be function as invitro conditions.
(2) It can't be denatured at high temperatures.
(3) No need of a primer for its functioning.
(4) It can be required in small quantities.
(5) It can be replacing the DNA – RNA hybrids.

33) Correct statement regarding the designing of pest resistant GM plants.

(1) Bacteria kill the pest.
(2) Bt. toxins can be harmful to mammals.
(3) *Bacillus thuringiensis* can be used to insert genes contains Bt. toxins into the *Canola* plant.
(4) Roundup ready plants are known as pesticide tolerant plants.
(5) *Escherichia coli* can be used in this process.

34) Which of the following statement is correct regarding ecological pyramids?

(1) Pyramid of energy can be inverted because of loss of energy in every trophic level.
(2) There is a decrease in the bio mass from lower to the higher trophic level.
(3) In the pyramid of numbers, higher numbers found in the higher trophic levels and lower numbers found in the lower trophic levels.
(4) Cycling of energy takes place in the ecological pyramids.
(5) Food web of ecosystem can be identified by means of ecological pyramids.

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35) Which of the following combination represents a community in a particular ecosystem?

(1) Sedges, citronella grass, cogon grass, deer.
(2) Holy mangrove, butter cup, *Salvinia*, black ruby barb.
(3) Water hyacinth, *Halodule*, *Halophyla*, *Colocasia*.
(4) *Cassia*, elephants, *Cissus*, leopard.
(5) *Manilkara*, nelli, bear, cinnamon.

36) Consequence of global warming and climatic changes to our country.

(1) Increase of the skin cancer.
(2) Increase of spread of dengue disease.
(3) Increase of accumulation of heavy metals in the water bodies.
(4) Acidification of sea.
(5) Occurrences of earth quakes.

37) Correct statement of the followings.

(1) Chemo heterotrophic bacteria utilizes inorganic carbon as carbon source.
(2) Life cycles of viruses that infect plants, animals and bacteria are different.
(3) Prions can exist without nuclei acids.
(4) Some cyanobacteria can reproduce sexually.
(5) Mycoplasma can locomote with the aid of flagella.

38) In routine testing of water samples for consumption, why the presence of indicator organisms such as coliform bacteria tested instead of presence of the pathogenic microorganisms?

(1) They do not produce endospores.
(2) They are gram negative.
(3) The are facultative anaerobes.
(4) Pathogens may present only in small numbers.
(5) They produce gaseous products in lactose broth culture media.

39) Three basic principles of food preservation as follows:

a. Prevention of entry of microorganisms into food in asepsis.
b. Prevention of growth and activity of microorganisms in food.
c. Removing or killing of microorganisms in food.

Adding chemicals is based on which of the above principle /principles?

(1) a, b and c.
(2) only b and c.
(3) only b.
(4) only c.
(5) only a and c

40) Correct combination regarding sterilization methods – materials.

(1) Incineration - industrial wastes.

(2) Hot air sterilization - culture medium.

(3) Membrane filtration – thermostable liquids.

(4) Radiation – minor surgical instruments.

(5) Moist heat sterilization – glass wares.

- **Use the following instructions for the questions 41– 50.**

A, B, D	A, C, D	A, B	C, D	Any other response
1st Answer	**2nd Answer**	**3rd Answer**	**4th answer**	**5th Answer**

41) Correct statement / statements regarding cell wall.

A. In plant cells, it is an extra cellular structure.

B. In plant cells, secondary cell wall is found interiorly to the primary cell wall.

C. The chemical composition of the cell wall does not greatly vary within a particular species.

D. It helps in maintenance of cell shape with the aid of cytoskeleton fibers.

E. Additional to plant cells, cell wall found in prokaryotes and all protists.

42) Some characteristics are found among animals.

- Do not show cephalization and segmentation
- Do not show complete digestive system.
- Mouth down version.

Phyla / phylum that containing animal /animals consisting the above characteristics.

A. Chordata B. Nematoda

C. Echinodermata D. Cnidaria

E. Mollusca

43) Gibberellins

A. regulates sex determination.

B. stimulate the fruit growth.

C. stimulates stem elongation in low concentrations.

D. stimulate pollen tube growth.

E. modify apical dominance.

44) Participate / participates in parturition.

A. Oxytocin.

B. Eastrogen.

C. Prostaglandins.

D. Progesterone

E. Prolactin.

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45) Correct statement / statements regarding human skull
   A. Zygomatic arch is found at the place where cranial bones join with facial bones.
   B. Sinuses are found only in the cranial bones.
   C. Parietal bones and temporal bones are paired in the cranium.
   D. It protects the brain, inner ear, middle ear, olfactory organs and eyes.
   E. Occipital condyles that found on either side of the foramen magnum articulate with the first typical cervical vertebra.

46) Dihybrid cross between two heterozygotes do not produce 9:3:3:1. Reason / reasons for this
   A. Gene interaction.
   B. Genetic linkage.
   C. Incomplete dominance.
   D. Co- dominance.
   E. Polyallelism.

47) Occur / occurs in both prokaryotic and eukaryotic cellular organizations during the process of protein synthesis.
   A. Production of polysomes.
   B. Reading frame is always from left to right.
   C. Translation starts before translation is terminated.
   D. Using UAG, UGA, UAA as stop codons.
   E. Always having methionine as start codons.

48) Which of the following species is / are endemic as well as found in tropical rain forest in Sri Lanka?
   A. Purple faced langur B. Kittul C. Loris
   D. Hora E. *Mesua ferrea*

49) Disease / diseases for which immunity can be induced using sub unit vaccines.
   A. Hepatitis – A B. Measles C. Tetanus
   D. Diphtheria. E. Rabies

50) Characteristics / characteristic of fish species that should be cultured
   A. It poses a better colour.
   B. It should not have adverse environmental impacts.
   C. It should reach the sexual maturity quickly.
   D. It should tolerate high population density.
   E. It should not be easy to breed.

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Sixth Term Examination – 2022

Conducted by

Field Work Centre, Thondaimanaru.

Biology - II	**Three Hours ten min.**	**09**	**E**	**II**
	Gr -13 (2022)			

Index No: ……

Instructions:

- This paper consists of **10** questions of **09** pages.
- This paper has both **A** and **B** parts. Time allotted to part II is three hours and ten minutes. **(Additional reading time is 10 minutes).**

Part- A Structured essay (pages 2-08)

- Answer **all four** questions in this paper itself.
- Write the answer in the space provided. Note that the space provided is adequate for your answers and elaborate answers are **not** expected.

Part- B Essay (page 09)

- **Answer four questions only.** Use the answer papers provided. At the end of the time tie the Part A and Part B and handover to the invigilator.
- Only part B can be **taken off** from the examination hall.

For examiner's use only.

Part	Question No.	Marks
A	01	
	02	
	03	
	04	
B	05	
	06	
	07	
	08	
	09	
	10	
Total		

Total Marks

In Numbers	
In Letters	

Marking Examiner 1	
Marking Examiner 2	
Marks Checked by	
Supervised by	

A – Structured Essay

(Each question carries 100 marks)

01. A) i) Indicate **three** environmental problems arise due to over exploitation of natural resources.

.....

.....

.....

ii) Expansion upon freezing is one of the major properties of water. Indicate the benefit of the above property for organisms.

.....

iii) Name the smallest carbohydrate found in organisms.

……

iv) Indicate **two** structural proteins and give **one** function for each.

……. ……

……. ……

v) Name an organelle which involved in both detoxification and production of vesicles.

……

vi) a) What is anchor junction?

……

……

b) State a location where anchor junction found in human body.

……

B) i) Name **one** molecule that act as an allosteric activator in living cells.

….…….

ii) Indicate the followings in the linear electron flow of light reactions of photosynthesis.

a) Photo system / photo systems …….

b) Product / products ……...

iii) a) What is limiting factor in photo synthesis?

….……..

…..……..

….……..

b) Under normal conditions which would be the limiting factor of photosynthesis?

……..

c) Give a strategy to overcome the problem regarding the above limiting factor you mentioned in (iii) b.

…...……

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iv) Give the reaction takes place in the link reaction of cellular respiration.

……

v) a. What is respiratory quotient?

……

……

……

b. What is respiratory quotient value during the germination of a seed of a legume plant?

……

C) i) Name a major molecule which was packed into the protocell.

……

ii) What were the observations made by Charles Darwin to put forward his theory of natural selection?

……

……

iii) State the phylum of seedless vascular plant that has a more recent to bryophytes and name **two** genus that belongs to the phylum.

……

……

……

iv) **a)** External fertilization **b)** Radial symmetry

c) Marine habitat **d)** Sensory organs.

Indicate with **alphabet / alphabets** which of the above characteristic/s is /are found in the following animal phyla.

1) Cnidaria: ……

2) Platyhelminthes: ……

3) Nematoda: ……..

02. A) i) Indicate **two** characteristics that differentiate the meristematic cells structurally from most of the other cells.

.....

.....

ii) Which plant tissue allow rapid regrowth in damaged leaves?

.....

iii) a) What is the benefit of horizontally oriented leaves?

……

b) Indicate the type of tissue found upper side and lower side to the mid vein of a dicot plant leaf.

.....

iv) a) Indicate **two** reasons for the reduced pressure in the in the sink.

……

.....

b) Through in which the substances can move from cell to cell in symplastic path way?

.....

v) a) Indicate the element essential for both chlorophyll synthesis in photosynthesis and N_2 fixation.

……

b) What is the deficiency symptom caused by the element for plants you mentioned above in v) a.?

.....

vi) Name the plant genus that shows each character given below.

a) Female gametophyte develops into endosperm.

……

b) Spores give rise to protonema.

……

B) i) Give the type of epithelium that makes the alveoli.

……

ii) Indicate **two** locations of cartilage found among bones of thoracic cage.

……

……

iii) Indicate the functions of cholecystokinin and secretin in the stomach.

……

……

……

iv) Indicate **two** instances that the lipids functioning as insulators in the human body.

……..

……

v) a) What is single circulation?

……

b) Indicate an animal class which contains single circulation.

……

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vi) Briefly indicate the consequences of a Rh^- mother bears a Rh^+ child for the first time and if she is pregnant for the second time with a Rh^+ child.

……..

……

……

C) i) What is the main characteristic of a respiratory surface for an efficient diffusion takes place?

……

ii) What is the benefit that walls of larynges and trachea are strengthen by cartilage?

……

iii) Write in the brackets as "**correct**" or "**incorrect**" whether the following statements regarding the homeostatic control in respiration is correct or incorrect respectively.

1. Sensors in carotid bodies and aorta detects the decreased blood pH. ( )

2. Medulla of the upper part of the brain stem and pons varolii of the lower part of the brain stem involve in the control of regulation of respiration. ( )

iv) Indicate **two** locations where the anti-microbial proteins found as inactive stage.

……

v) Which cells discharge signal molecules during inflammatory response?

……

vi) Name an organelle involves in osmoregulation of unicellular organisms such as *Amoeba*.

……

vii) Indicate the role of aldosterone in the distal convoluted tubule of the human nephron.

……

……

03. A) i) a) What is an impulse?

.....

b) Indicate **two** instances which increases the speed of the impulse.

.....

.....

ii) Where the main input centre of sensory information from sense organs located in the human brain?

…….....

iii) a) Indicate briefly the organization of human parasympathetic nervous system.

……

……

……

……

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b) **Adrenal medulla, heart and urinary bladder**. Of which of these both sympathetic and parasympathetic act / acts on?

……...……

iv) Indicate the photo receptor cells found in the human retina and give the visual pigment and one function for each.

Photo receptor cell.	**visual pigment**	**function**
……..	…….	……..
……..	…….	……..

B) i) What is the origin of bony labyrinth of human inner ear?

……

ii) Name a hormone which can promote breakdown of skeletal muscle proteins for synthesis of glucose when the body requires more glucose.

……...……

iii) Which are the target locations of hormones that secrete from pancreas?

……...……

iv) Indicate the homeostatic role of liver regarding human hormones.

……...……

v) a) Which hormone is involved with the inhibition of growth and development of sex organs before puberty?

……...……

b) Name a hormone that promotes spermatogenesis after puberty, other than testosterone.

……...……

vi) Indicate **two** sperm nutrients which are found in semen.

……

vii) a) Briefly indicate how the disintegration of corpus luteus occurs.

……

……...……

……...……

b) Which is the respiratory organ of the human fetus?

……...……

C) i) Indicate one invertebrate phylum which possess only exoskeleton and endoskeleton.

Exoskeleton: ……

Endoskeleton: ……...

ii) Which skull bone consists of sinuses and involved only in the formation of face?

……

iii) Indicate **two** contributory adaptations found in the vertebrae for the upright posture in human.

……

……

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iv) What is meant by pivot joint?

……

……

……

v) a) Which muscle type / types is / are involved in sliding filament theory?

……

b) What happens for the lengths of the actin and myosin filaments during muscle contraction?

……

04. A) i) a) Name the following cross and indicate its purpose.

F_1 organism X pure breeding recessive parents.

Cross: ……

Purpose: ……

b) In a dihybrid cross, F_2 generation showed a phenotypic ratio of 3:1, instead of expected Mendelian ratio of 9:3:3:1. What is the possible reason for this?

……

ii) a) What is polyploidy?

……

……

b) What is the important consequence of polyploidy in plant breeding?

……

iii) a) What is removal of contaminating materials in the isolation of DNA?

……

b) Indicate **two** advantages of using yeast artificial chromosomes (YACs).

……

……

iv) Indicate two main enzymes used in constructing cDNA libraries.

……

……

v) What is metagenomics?

……

……

vi) Give the events of one thermal cycle of PCR in sequential order.

……

……

B) i) a) What are tertiary consumers?

……

b) Give **one** example for a tertiary consumer.

……

ii) Which biomes contain plant epiphytes?

……..……

……..

iii) Indicate **two** plant species that found in sea shore a distance away from the tide mark.

……

iv) What is meant by key stone species?

……..

……..

v) In which Sri Lankan Forest the Yala and Wilpathu national parks are included?

……..

vi) a) Which convention provides the frame work for the conservation and wise use of wetlands and their resources?

……..

b) Name **three** sites located in Sri Lanka regarding the above convention other than in north-western province.

…..……..

…..……..

C) i) Name **two** genera involve in the production of vinegar.

……..……

……..

ii) Which organism consumes large amount of methane from ocean sediments?

……

iii) a) Briefly explain how filtration step is done in the process of urban drinking water treatment.

…..……

…..……

……..

……..

b) Give the products form during food spoilage by saccharolytic microorganisms.

……..

iv) Indicate **one** fish species that have been conserved via ornamental fish production.

……..

v) Indicate **one** fish species that have been introduced in water bodies to eliminate larval stages of mosquito vectors of dengue and filariasis.

……..

vi) What is the major difference of embryonic stem cells and adult stem cells?

……..

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Sixth Term Examination – 2022

Conducted by

Field Work Centre, Thondaimanaru.

FWC

Biology - II	Grade 13(2022)	09	E	II

B – Essay

- Answer **four** questions only.
- Draw fully labelled diagrams where necessary.
  (Each question carries **150** marks).

05. Explain how the evolution of C4 path way established to minimize the photo respiration and describe the C4 path way.

06. a) Briefly describe the stomatal transpiration.

b) Describe the responses that are showed by plants to abiotic stresses.

07. Write an account on human blood pressure.

08. a) Briefly describe how resting membrane potential is maintained in a neuron.

b) Describe the adaptations of the lower limb of human for the erect posture, bearing of body weight and walking.

09. a) Briefly describe the Patana grass lands of Sri Lanka.

b) Briefly describe the test done to ensure the quality of drinking water.

10. Write short notes for the followings:

a) Central vacuole.

b) Applications of DNA finger printing.

c) Tissue culture.

**********☆**********