

SECTION A (40 Marks)

Compulsory: To be attempted by all candidates.

Question 1

(a) *Directions: Each question in this part is followed by four possible choices of answers. Choose the correct answer and write it in the space provided.*

[15]

(i) The golgi bodies are related to

- A respiration.
- B circulation.
- C secretion.
- D excretion.

Answer:.....

(ii) The combination of gene responsible for a particular characteristic in an individual is called

- A alleles.
- B genotype.
- C phenotype.
- D autosomes.

Answer:.....

(iii) It is not advisable to use excess of chemical fertilizers in the fields because the plants will die due to

- A active transport.
- B endosmosis.
- C exosmosis.
- D diffusion.

Answer:.....

(iv) The rate of transpiration decreases with the increase in

- A humidity.
- B temperature.
- C light intensity.
- D velocity of wind.

Answer:.....

- (v) Aquatic plants float in water during day time because
- A carbon dioxide produced during the day makes them buoyant.
 - B oxygen produced during the day makes them buoyant.
 - C they become lighter as they produce glucose.
 - D they enjoy the sunshine.

Answer:.....

- (vi) The blind spot is a part in the eye where
- I. rods are absent.
 - II. cones are absent.
 - III. brightest image is formed.
 - IV. maximum number of cones are present.

The correct combination for the statement given above is

- A I and II.
- B I and IV.
- C II and III.
- D III and IV.

Answer:.....

- (vii) An injury to the diencephalon may result in
- A loss of sensation of heat.
 - B difficulty in breathing.
 - C loss of intelligence.
 - D loss of memory.

Answer:.....

- (viii) Which of the following is **NOT** a condition caused by the under secretion of thyroxine?
- A cretinism
 - B myxoedema
 - C simple goitre
 - D exophthalmic goitre

Answer:.....

(ix) The gestation period in human beings is completed in the organ called

- A uterus.
- B ureter.
- C urethra.
- D urinary bladder.

Answer:.....

(x) The release of ovum from the follicle is called

- A menstrual cycle.
- B fertilization.
- C oogenesis.
- D ovulation.

Answer:.....

(xi) All of the following are contraceptive methods in females **EXCEPT**

- A Copper 'T'
- B vasectomy.
- C tubectomy.
- D contraceptive pills.

Answer:.....

(xii) Anti-venine is used for

- A tuberculosis.
- B viral fever.
- C snake bites.
- D dog bites.

Answer:.....

(xiii) The vaccination to prevent a child from tuberculosis is

- A BCG.
- B DPT.
- C BGC.
- D DTP.

Answer:.....

- (xiv) The growth rate of population is the difference between
- A mortality rate and population density.
 - B natality rate and population density.
 - C natality rate and mortality rate.
 - D natality rate and demography.

Answer:.....

- (xv) All of the following are the functions of the Red Cross **EXCEPT**
- A collect and supply information about the occurrence of disease.
 - B extend relief and help to victims of war.
 - C educate people in accident prevention.
 - D look after maternal and child welfare.

Answer:.....

(b) Name the following. [5]

(i) The cell organelle responsible for intracellular digestion.
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(ii) The wave of electrical disturbance that passes over the nerve cell.
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(iii) A deficiency disease which can be prevented by taking iodized salt.
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(iv) The structure responsible for diffusion of nutrients and waste materials between mother and foetus.
.....

(v) The type of resource that can be replenished by reproduction or by recycling.
.....

(c) **I. Write TRUE or FALSE for the following statements.** [3]

(i) The **RECEPTOR** is a muscle or gland that responds to a motor nerve impulse.
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- (ii) **MENARCHE** is the permanent stoppage of menstruation.
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- (iii) **VAS-DEFERENS** and sperm duct are one and the same thing.
.....
- (iv) Human population increases in **GEOMETRICAL PROGRESSION**.
.....
- (v) **IMMUNISATION** is the resistance to the onset of disease after infection by harmful germs.
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- (vi) Typhoid, dysentery and cholera are **WATER BORNE** diseases.
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II. If false, rewrite the false statements in the correct form by changing only the words printed in BOLD letters. [3]

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(d) Fill in the blank. [5]

- (i) A fibre appears between two daughter centrioles during prophase.
- (ii) Wooden doors swell by absorbing water due toduring rainy season.
- (iii) The source of oxygen produced during photosynthesis is from
- (iv) The sensory cells in the eye concerned with colour vision are
- (v) Antibodies are produced on exposure to

(e) Write down ONE difference between the following pairs as per the direction given in the brackets in the tables given below.

(i) Autosome and sex chromosome (number of chromosomes)

Autosome	Sex chromosome

(ii) Diffusion and osmosis (type of movements of molecules)

Diffusion	Osmosis

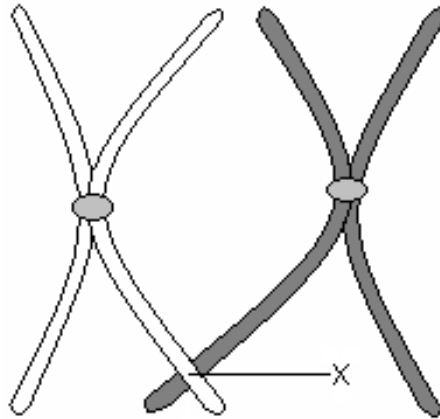
(iii) Sympathetic nervous system and parasympathetic nervous system (action on body)

Sympathetic nervous system	Parasympathetic nervous system

(iv) Transpiration and guttation (outlet of water)

Transpiration	Guttation

(f) Observe the diagram given below and answer the questions that follow.



(i) Name the type of cell division in which the above stage occurs. [1]

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(ii) Name the part marked 'X' on the diagram. [1]

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(iii) Redraw the diagram to show how it would appear after the stage given above. [1]

(iv) What is the importance of this stage in cell division? [2]

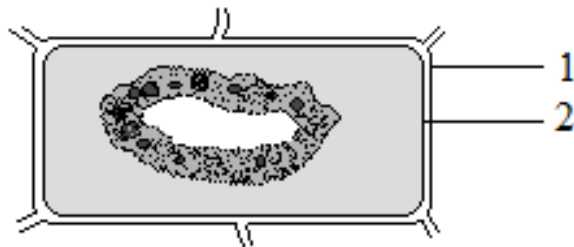
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SECTION B (40 Marks)

Attempt any four questions

Question 2

- (a) The diagram given below shows a plant cell after being placed in a certain type of solution. Study the diagram and answer the questions that follow.



- (i) Label the parts numbered 1 and 2. [1]

1.....

2.....

- (ii) What is the state of the cell shown in the diagram? [1]

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- (iii) Name the tonicity of the solution in which the cell was placed. [1]

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- (iv) How can the cell be brought back to its original condition? Explain. [1]

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- (v) Explain the process that has taken place in the diagram above. [1]

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(b) Define the following.

(i) Alleles

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(ii) Bleeding [1]

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(iii) Active transport [1]

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(iv) Natality [1]

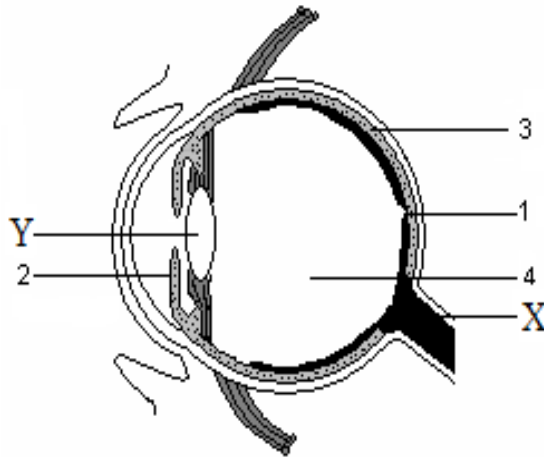
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(v) Prophylaxis [1]

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Question 3

a) The diagram given below shows the vertical section of a mammalian eye.



(i) Name the parts numbered 1 – 4. [2]

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(ii) Write the functions of the parts labelled 2 and 3. [2]

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(iii) Name the eye defect when the part marked 'Y' becomes opaque. [½]

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(iv) What will happen if the part marked 'X' is cut off and why? [1½]

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(b) Give appropriate terms for the following:

(i) Type of protein found in the cell membrane.

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(ii) The inward diffusion of water through a semi-permeable membrane.

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(iii) Number of individuals per square km at any given time.

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(iv) Type of vaccine in which extracts of toxin secreted by bacteria are used.

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Question 4

(a) A heterozygous dominant tall pea plant is crossed with another heterozygous dominant tall pea plant.

(i) Draw a chart to show the possible inheritance of height in their off-springs. [1]

(ii) Find out the proportion of genotypes and phenotypes in the off-springs. [2]

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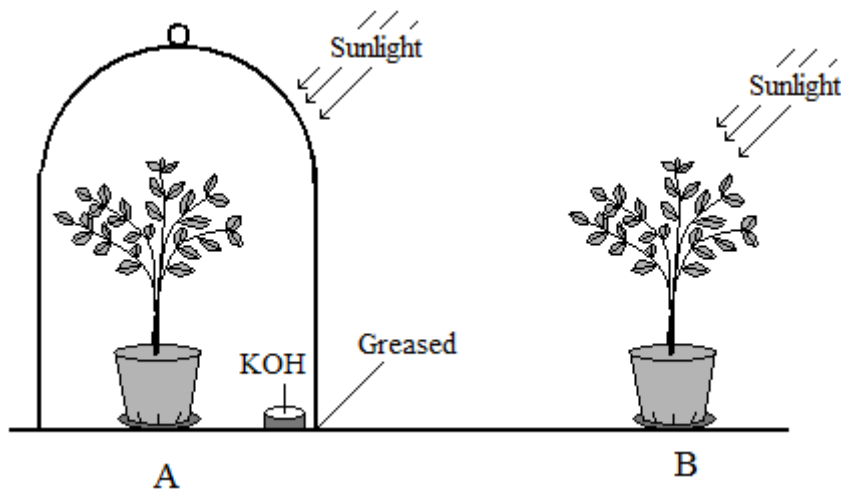
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Question 5

- (a) Karma took two-healthy green plants from his garden and placed in a dark room for 24 hours. He then set-up the experiment as shown in the figure below and left for 6 hours. He took a leaf from each plant and removed the chlorophyll.



- (i) What is the aim of the above experiment? [1]

- (ii) How is the chlorophyll removed? [1]

- (iii) Which of the two set-ups - A or B is the control? [½]

- (iv) Why is the KOH placed in the set-up A? [1]

- (v) What result would Karma get for – leaf A from set-up A and leaf B from set-up B after doing the iodine test? Explain the result. [1½]

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(b) (i) Why is the gray matter of cerebrum folded to form convolutions? [2]

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(ii) Why is it harmful to use a sharp object to remove the wax from the ear? [1]

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(iii) Name the type of reflexes in each of the following actions. [2]

1. Mouth salivating at the smell of delicious food.

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2. Knee-jerk as a result of a sharp tap.

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3. Closing of the eye lids in strong light.

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4. Knitting without looking.

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Question 6

- (a) (i) Draw a neat diagram of a matured human sperm cell and label the following parts
1. tail
 2. acrosome
 3. mitochondria
 4. nucleus

(ii) What is the function of: [2]

1. acrosome?

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.....

2. mitochondria?

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(iii) What will happen to the tail of the sperm after fertilization? [1]

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(b) Write at least *two* differences for the following pairs in the table given below. [4]

(i)

Active Immunity	Passive Immunity

(ii)

Stomatal transpiration	Lenticular transpiration

Question 7

(a) Give reasons for the following: [5]

(i) Mother's blood doesn't circulate directly through the embryo.

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(ii) Human red blood cells are circular and biconcave in shape.

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(iii) Discovery of antibiotics and vaccination has led to the sharp rise in population.

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(iv) Abnormally large number of WBCs in the blood are usually an indication of some infection in the body.

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(v) Pancreas is both a duct gland as well as a ductless gland.

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(b) Write down any *two* functions of the WHO. [2]

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(c) Explain how the following factors may lead to population explosion in Bhutan. [3]

(i) Illiteracy

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(ii) Desire for male/female child

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(iii) Lack of recreation

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