

General Instructions

1. Attempt all questions from Section I and any four questions from Section II.
2. The intended marks for questions or parts of questions are given in brackets.

SECTION I (40 Marks)

Attempt all questions from this Section.

Question 1

(a) Name the following: [8]

- i. The duct which transports urine from the kidney to the urinary bladder.
- ii. The endocrine gland which produces emergency hormone.
- iii. The sheet of muscle between the thorax and the abdomen of man.
- iv. The fluid that is present inside and outside the brain.
- v. The opening through which light enters the eyes.
- vi. Openings on the stem through which transpiration occurs.
- vii. The organ in man concerned with maintaining water balance in the body.
- viii. The photosensitive pigment present in the 'rod' cells in the retina.

(b) Select the correct answer out of four available choices given under each question.

Rewrite the correct answer from I to VIII: [8]

- i. Osmosis involves diffusion of :
 - (i) suspended particles from lower to higher concentration.
 - (ii) suspended particles from higher to lower concentration.
 - (iii) water from the more concentrated solution to the less concentrated solution.
 - (iv) water from the less concentrated solution to the more concentrated solution.
- ii. Transpiration pull will be maximum under which of the following conditions?
 - (i) open stomata, dry atmosphere and moist soil.
 - (ii) open stomata, high humid atmosphere and well irrigated soil.
 - (iii) open stomata, high humid atmosphere and dry soil.
 - (iv) closed stomata, dry atmosphere and moist soil.
- iii. If the rate of respiration becomes more than the rate of photosynthesis, plants will :
 - (i) continue to live , but will not be able to store food.
 - (ii) Be killed instantly.
 - (iii) grow more vigorously because more energy will be available.
 - (iv) stop growing and gradually die of starvation.
- iv. Which one of these reactions occurs during photosynthesis?
 - (i) carbon dioxide is reduced and water is oxidised.
 - (ii) water is reduced and carbon dioxide is oxidised.

- (iii) carbon dioxide and water are both oxidised.
- (iv) carbon dioxide and water are both reduced.
- v. Excretion commonly involves :
 - (i) removal of all by-products during catabolism.
 - (ii) removal of by-products during anabolism.
 - (iii) removal of nitrogenous waste.
 - (iv) all of the above.
- vi. In mammals, the corpus callosum connects:
 - (i) the two optic lobes.
 - (ii) the two cerebral hemispheres.
 - (iii) the two cerebrum to the cerebellum.
 - (iv) the pons to the medulla oblongata.
- vii. which of the following is the route that a sperm follows when it leaves the testis of a mammal ?
 - (i) Vas deferens -> epididymis -> urethra.
 - (ii) urethra-> epididymis-> vas deferens.
 - (iii) epididymis -> urethra -> vas deferens
 - (iv) epididymis -> vas deferens -> urethra.
- viii. Which one of the following NOT a function of WHO?
 - (i) Maintaining statistical health records for most countries.
 - (ii) Preparation and marketing of new medicines.
 - (iii) Regulating international quarantine work.
 - (iv) Playing an important role in the eradication of epidemic and endemic diseases.

(c) Given below is an example of a certain structure and its special functional activity e.g. Kidney and excretion.

On a similar pattern fill in the blanks: [8]

- i. Ribosomes and
- ii. Blood platelets and
- iii. Cochlea and
- iv. Hydathodes and
- v. Alveoli and
- vi. Chloroplasts and
- vii. Meninges and
- viii. Neutrophils and

(d) Choose the odd one in each of the following: Example: Calyx , Corolla, style , Androecium. Answer: style [8]

- i. Insulin , Blood sugar, Adrenalin , Thyroxine
- ii. Oestrogen, Progesterone, Testosterone , Prolactin

- iii. Larynx, Pancreas , Testis , Ovary
- iv. Cerebrum , Cranium , Cerebellum , Pons
- v. Cell wall, Plastids , Large Vacuole , Centrosome
- vi. Cortex , Pelvis , Retina , Medulla
- vii. Trachea , Bronchus , Alveolus , Diaphragm
- viii. Phenol , Boric acid , Iodine , Mercurochrome.

(e) Which of the statements in Column II are appropriate for the items listed in Column I? Rewrite the correct matching pairs [8]

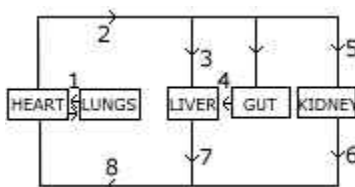
| Column I | Column II |
|-------------------|------------------------------------------------------------------|
| 1)The blind spot | a) carries impulses away from the brain and spinal cord. |
| 2)The yellow spot | b)carries impulses towards the brain and spinal cord |
| 3)The stroma | c)is the place for aerobic respiration. |
| 4)The grana | d)is the place for dark reaction of photosynthesis |
| 5)Cretinism | e)is the place through which transpiration takes place. |
| 6)Myxoedema | f)is the place for light reaction of photosynthesis |
| 7)Afferent neuron | g)is the number of deaths in a specified number of time |
| 8)Mortality | h)is the number of live births in a specified period of time |
| | i)is free of rod cells. |
| | j)is the exact centre of the posterior portion of the retina |
| | k)is a condition due to undersecretion of thyroxine in an adult. |
| | l)is a condition due to lack of thyroxine in a child. |

SECTION II (40 MARKS)

Attempt any four questions from this Section.

Question 2

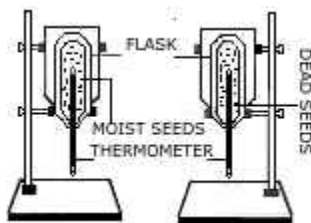
(a) The following simplified diagram refers to the outline plan of the circulation of blood in a mammal. Study the diagram and write the number and the name of the blood vessel in each case as mentioned under: [5]



- Several hours after a meal containing a lot of protein, which vessel will contain the highest concentration of urea?
 - Which vessel would contain the highest concentration of amino acids and glucose soon after a meal?
 - Which vessel begins and ends in capillaries?
 - Which vessel will contain the smallest number of red blood cell per unit volume of blood?
 - In which vessel will the blood carry the most oxyhaemoglobin?
- (b) Explain briefly the role of the following health aids: [5]
- Antiseptics
 - Disinfectants
 - Penicillin
 - Sulphonamides
 - Vaccines

Question 3

(a) Moist germinated seeds were placed in thermos flask A, and germinating seeds which were placed in thermos flask B. Thermometers were inserted in the flasks and the mouth of each flasks plugged with moist cotton wool. The two flasks were fixed upside down as shown in the diagram. The initial temperature on both thermometers was noted. After about 48 hours, the temperature in flask A was found to be much higher than that in flask B [5]

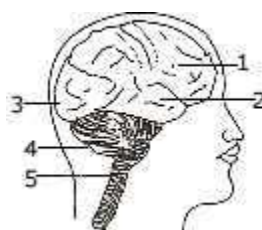


- State the object of using the apparatus.
- Explain why a rise in temperature occurs in flask A.
- If 5% formalin was not used after boiling the seeds, the temperature of flask B would have risen considerably. Explain.
- Why were the flasks inverted?

(b) The following diagram is that of a human brain. Guidelines 1 to 5 indicate different parts of the surface of the brain and these are as follows:

1. Frontal lobe of cerebrum
2. Temporal lobe of cerebrum
3. Occipital lobe of cerebrum
4. Cerebellum
5. Medulla oblongata

study the diagram and answer the following questions: [5]

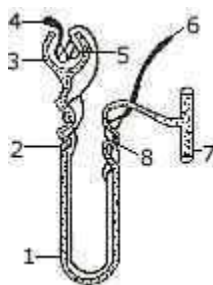


- i. What handicaps would result from:
- ii. damage to part numbered 3?
- iii. damage to part numbered 4?

(II) Mention one main function of each of the parts numbered 1, 2 and 5.

Question 4

(a) The following diagram represents a mammalian kidney tubule and its blood supply. Parts indicated by the guidelines 1 to 8 are as follows:



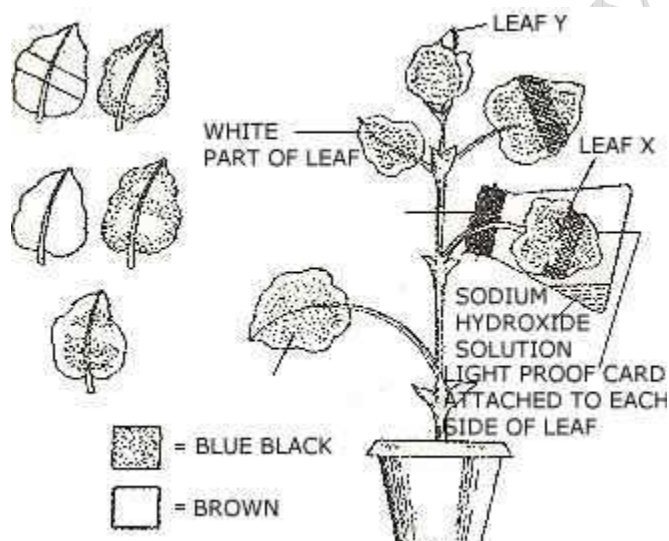
1. U-shaped loop of Henle.
2. Proximal convoluted tubule with blood capillaries
3. Bowman's capsule
4. Afferent arteriole from renal artery.
5. Glomerulus
6. Venule to renal vein
7. Collecting tubule

8. Distal convoluted tubule with blood capillaries

study the diagram and answer the following questions in each case: [5]

- Where does ultrafiltration take place?
- Which structures contains the lowest concentration of urea?
- Which structures contains the highest concentration of urea?
- Which structures contains the lowest concentration of glucose?
- Where is the most water reabsorbed?

(b) A well watered healthy potted plant with variegated leaves was kept in darkness for about 24 hours. It was then set up as shown in the diagram below and exposed to light for about 12 hours. At the end of this time, leaf X and leaf Y were tested for starch. Study the diagram and answer the questions that follows: [5]



- Why was the plant initially kept in darkness for 24 hours?
- What is the function of sodium hydroxide solution in the flask?
- select the correct leaf from the five available choices shown in the diagram as A,B,C,D,and E . Rewrite the correct answer by filling in the appropriate letter for the question that follows:
 - After the starch test, leaf X would look like ..blue.....
 - After the starch test, leaf Y would look like....brown.....

(iv) The experiment with leaf Y shows that photosynthesis requires the presence of certain factors. Mention any one factor.

Question 5

(a) State one function of each of the following: [5]

- i. Ciliated epithelium lining the respiratory tract
- ii. Epiglottis
- iii. Skin
- iv. Mitochondria
- v. Medulla Oblongata

(b) The following diagram represents a plant cell after being placed in a strong sugar solution. Guidelines 1 to 5 indicate the following:

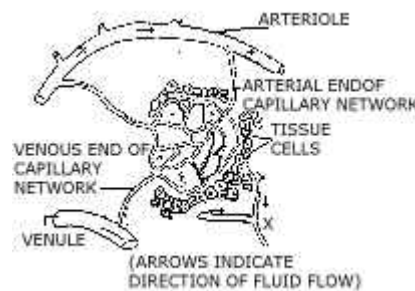
1. Cell wall
2. Strong sugar solution
3. Protoplasm
4. Large vacuole
5. Nucleus

study the diagram and answer the questions that follow: [5]

- i. What is the state of the cell shown in the diagram?
- ii. Name the structure which act as a selectively permeable membrane.
- iii. If the cell had been placed in distilled water instead of strong sugar solution, which features would not have been present?
- iv. If the cell in the diagram possessed chloroplasts, where would these be present?
- v. Name any one feature of this plant cell which is not present in animals cells.

Question 6

(a) The diagram below shows part of the capillary bed in an organ of the mammalian body. Some of the blood arriving at the capillaries at points labelled. A moves out into the spaces between the tissue cells. Study the diagram and answer the questions that follows: [5]



- i. When the liquid from the blood is surrounding the cells, what is it called?
- ii. Name any one important component of the blood which remains inside the capillaries and fails to move out into the spaces.

- iii. Some of the liquid surrounding the cells does not pass directly back into the blood but eventually reaches it by another route through vessel X. Name the fluid present in vessel X.
- iv. What are the functions of Lymph?

(b) Answer the following questions: [5]

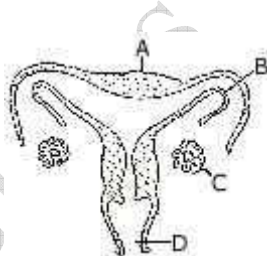
- i. Name the endocrine cells present in the Pancreas.
- ii. Name two hormones secreted by the above mentioned cells.
- iii. Mention one main function of each hormone named in (ii).

Question 7

(a) The figure given below represents the female reproductive system of a mammal. Parts indicated by the guidelines A to D are as follows: [5]

- A. Uterus
- B. Fallopian tube
- C. Ovary
- D. Vagina

Give appropriate terms for each of the following:



- i. The cost of reproductive phase in a young female.
- ii. Rupture of follicle and release of ovum from the ovary.
- iii. Monthly discharge of blood and disintegrated tissues in human female
- iv. Process of fusion of ovum and sperm.
- v. Fixing of developing zygote on the uterine wall.

(b) Differentiate between members of each of the following pairs with reference to the phrases in brackets: [5]

- i. Osmosis and Diffusion (flow of solvent molecules).
- ii. Myopia and hypermetropia (cause of the defect)
- iii. Glycolysis and Krebs's cycle (Reaction site of the process in a cell).
- iv. artery and vein (Direction of blood flow).
- v. Aerobic and anaerobic respiration (End products of the process).