

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during the first 15 minutes.

This time is to be spent in reading the Question paper.

The time given is the time allowed for writing the answers.

Part - I is compulsory. Attempt **any four questions** from Part II.

The intended marks for questions or parts of questions are given in brackets [].

Part – 1 (Attempt all questions.)

Question 1

A. Give the technical terms for the following:

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1. Proteins produced in blood to fight and destroy harmful microbes
2. Pressure controlling the movement of water in the cell
3. A preparation used to produce active immunity to a disease
4. The full term development of the foetus in the womb
5. Aggregation of nerve cell bodies

B. Copy and complete the following table by filling in the blank spaces numbered 1 to 10.

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Gland	Hormone secreted	Effect on body
1	2	regulates basal metabolism
3	Epinephrine	4
5	6	Stimulates contraction of uterus during child birth
Pancreas (β cells)	7	8
9	Somatotropic hormone	10

C. Identify whether each of the situations given below represents active or passive immunity.

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1. A child is given a vaccine called MMR to confer protection from three diseases, measles, mumps and rubella.
2. A newborn child gains protection from antibodies in the first breast milk, called colostrum.
3. A man is injected with antivenom after being bitten by a poisonous snake.
4. A group of people is given serum to combat an epidemic.
5. A child suffers from symptoms of chicken pox.

D. State the exact location and function of the following

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1. Sertoli cells
2. Organ of Corti
3. Purkinje fibres
4. Corpus callosum
5. Bulbo urethral glands

E. Choose the odd one out from each of the following sets giving the reason for your choice.

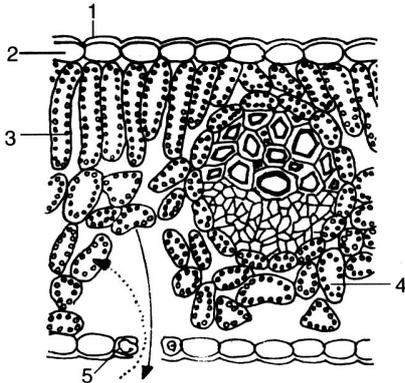
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1. Pleura, Meninges, Spinal cord, Pericardium
2. Thyroid gland, adrenal gland, pituitary gland, prostate gland
3. Labia majora, labia minora, vagina, vestibule, clitoris
4. Dwarfism, gigantism, diabetes mellitus, diabetes insipidus

5. Fallopian tube , uterus , ovulation , ovary , cervix

F. The diagram represents the vertical section of a leaf. Study the same and answer the questions that follow:

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1. Label the parts 2 to 5.
2. What do the two arrows (dotted and solid) indicate in the day time and at night for respiratory gases?
3. Mention the condition of cell 5 during day and at night.
4. Trace the path (write down the cells) of a water molecule from xylem moving out through the stoma.

G. The following cross represents schematically the inheritance of a sex linked disease (colourblindness) study and answer the questions that follow.

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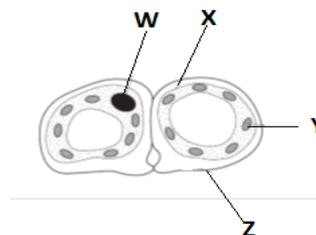
Parents : $X^C Y$ $X^C X$
 Gametes: X^C Y X^C X
 Offspring:

	X^C	X
X^C	$X^C X^C$	$X^C X$
Y	$X^C Y$	XY

1. What is the phenotype of the P1 individuals.
2. One of the P1 individuals is heterogametic, identify and give reason.
3. Give the phenotypes of the F1 generation individuals.
4. Copy and complete the sentence- Colourblindness is a disease linked with _____ chromosome and is expressed in _____ condition.
5. Although the father is colourblind, the possibility of son being colourblind in this case is only 50%. Give reason.

F. Choose the correct option and write the alphabet and the answer in the answer sheet 5

1. The diagram shows a cross section through two guard cells of a leaf.



Which labelled structures would not be present in the surrounding epidermal cell?

- A. W and X B. X and Y C. Y only D. W only

2. Untreated sewage can cause pollution of streams and rivers. Some changes in streams and rivers after sewage is added are shown.

- 1 fish die
- 2 the dissolved oxygen in the water decreases
- 3 the number of anaerobic organisms increases
- 4 the number of bacteria increases

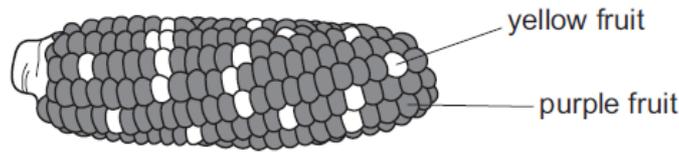
What gives the order in which these events occur?

- A. 1 → 2 → 4 → 3 B. 1 → 4 → 3 → 2

C. 2 → 1 → 4 → 3

D. 4 → 2 → 1 → 3

3. The diagram shows a maize (corn) cob with purple and yellow fruits. Purple (P) is dominant to yellow (p).



What are the genotypes of the parent maize plants, when crossed, yield the corn cob shown above.

A. PP × Pp

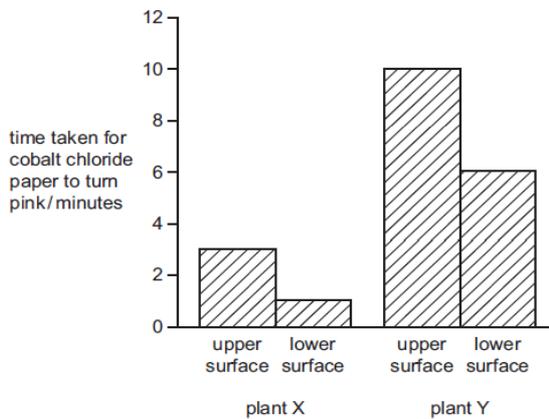
B. PP × pp

C. Pp × Pp

D. pp × Pp

4. Cobalt chloride paper is blue when dry but turns pink when wet. Some blue cobalt chloride paper was fastened to the upper and lower surfaces of a leaf on a plant X and a leaf on plant Y.

The diagram shows the results of the experiment.



Through which leaf surface was water lost most quickly?

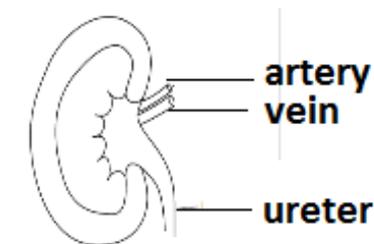
A. plant X, upper surface

B. plant X, lower surface

C. plant Y, upper surface

D. plant Y, lower surface

5. The diagram shows a kidney and its blood vessels.



In a healthy person, which structures transport glucose?

A. artery only

B. artery and ureter

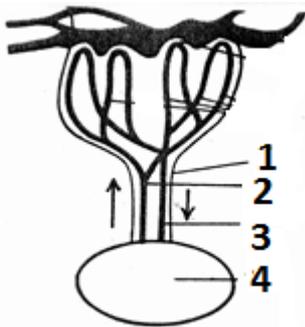
C. artery and vein

D. ureter and vein

Part -2 (Attempt any four questions)

Question 2

A. The diagram given alongside shows a diagrammatic view of the relationship between maternal blood and foetal blood. Study the same and answer the questions. 5



1. Label the structures 1 to 4.
2. Differentiate between parturition and ovulation
3. Explain: The foetus respire but does not breathe.
4. The blood of the mother never comes in direct contact with the blood of embryo. What will happen if there is a direct connection?

B. Give biological reasons for the following:

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- (i) Injection of adrenaline increases heartbeat.
- (ii) The leaflets of *Mimosa pudica* droop down on touching
- (iii) Oxygen given out during photosynthesis comes from water.
- (iv) Photosynthesis rate gets lowered even when there is enough of CO₂ in the air.
- (v) It is difficult to see in bright sunlight immediately after coming out of a dark cinema hall during noon show.

Question 3

A. Answer the following questions:

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1. Draw a neat and labelled diagram of Metaphase stage of mitosis in an animal cell having '6' chromosomes.
2. With reference to cell division explain the following terms.
 - a. Haploid Cell
 - b. Homologous chromosomes
3. Explain : The sex of the child is determined by the father.

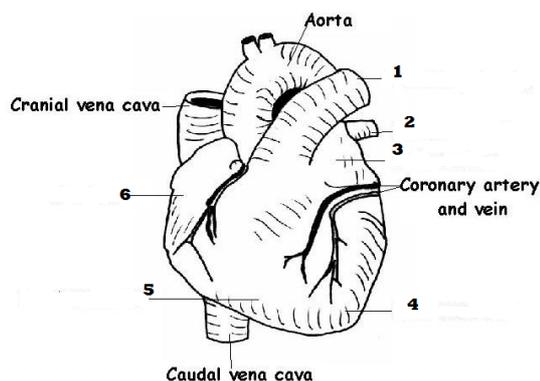
B. Write briefly as indicated in the brackets, on the following:

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1. Myopia (symptoms and cause)
2. Tubectomy (method and importance)
3. Ganong's potometer (two limitations)
4. WHO (two activities)
5. Chordae tendinae (location and function)

Question 4

A. The diagram given below indicates the external view of human heart. Study the same and answer the questions that follow.



1. Name the parts 1 to 4.
2. Differentiate between part 4 and 6 on the basis of its structure.
3. Mention the origin of the following vessels and where they lead to-
 - a. hepatic vein
 - b. hepatic portal vein

4. State the exact location of pacemaker and pace setter of human heart.

B. Do as directed.

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1. Why are the following used while performing the starch test for a leaf?
a. Methylated spirit b. Boiling water
2. Differentiate between bleeding and guttation with example.
3. Draw a neat and labelled diagram of an experimental set up showing liberation of oxygen during photosynthesis.

Question 5

A. Draw V.S. of human eye and label the parts with the numbers provided below.

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1. Part responsible for maximum refraction of light
2. Part that gives colour to the eye
3. Part that is avascular and gives shape to the eye ball
4. Area of brightest and sharpest vision
5. Nervous layer of eye
6. Protective epithelial lining of eye ball

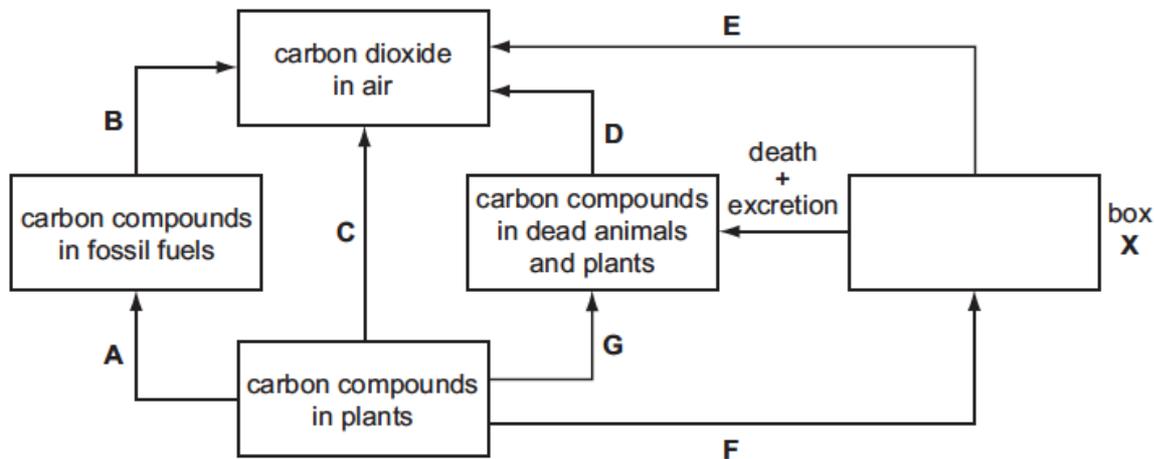
B. Differentiate between the following pairs on the basis of what is indicated in the brackets after each.

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- (i) Antibiotics and antiseptics (role)
- (ii) Amitosis and Mitosis (definition)
- (iii) Afferent arteriole and Efferent arteriole (composition of blood)
- (iv) Plasmolysis and Deplasmolysis (definition)
- (v) BCG and DPT (expanded form)

Question 6

A. Given below is the Carbon cycle.



1. Redraw the cycle.
 - a. Fill in box X
 - b. Draw an arrow to represent photosynthesis.
 - c. Label A, B, C and F.
2. Name the part of photosynthesis where C is fixed.
3. Give the equation for photosynthesis.

B. Do as directed.

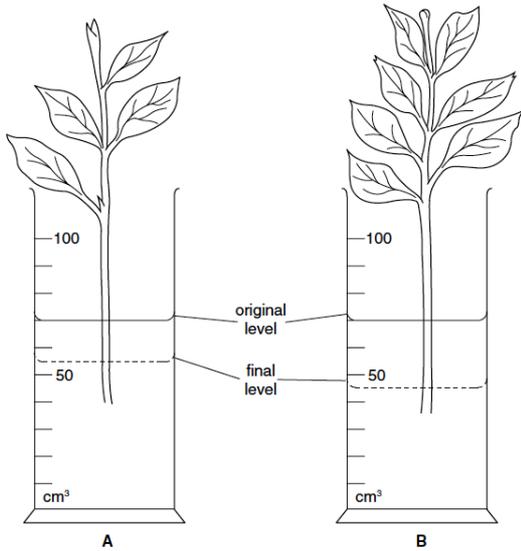
- Draw a neat and labelled diagram of multipolar myelinated neuron and differentiate between a nerve and a neuron.
- Explain :
 - Passive immunity provides immediate
 - Insulin is injected into the body of a highly diabetic patient and not given orally.
- State any four examples of secretions of our body that help in first line of defence.

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Question 7

A. Figure shows an apparatus used in an investigation into transpiration. The cylinders were set up and left in the same conditions for 24 hours.

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- What is the aim of the experiment?
- What does the difference in the final level of water in cylinder A and B indicate?
- What can be the cause of the change in water level in the two cylinders?
- Name two other factors that may affect this experiment.
- Define the process by which the water rises to the leaf through the stem.

B. Do as directed.

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- State two properties of a hormone.
- Draw a neat and labelled diagram of front view of female reproductive system.
- State two examples of artificial anticoagulants.
- Differentiate between serum and defibrinated blood.