

SECTION - B (Marks 42)

Q-2: Attempt all parts. Each part carries equal marks.

[14×3=42]

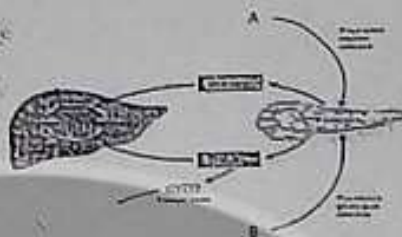
i. State three adaptations that enable the alveolus to function efficiently.

OR

Briefly discuss the classes of neurotransmitters with the help of some examples.

ii. Identify the type of feedback mechanism shown in the diagram and discuss the mechanism with reference to the two conditions labeled A and B in the diagram.

(1+1+1)

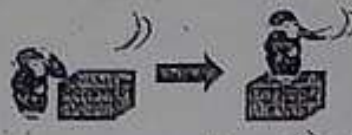


OR

Differentiate between the two types of behaviours shown in the diagram below.



A



B

iii. Identify and discuss the type of joint present between:

(1.5+1.5)

- a. Tooth root and jaw bones b. Wrist joint

OR

Critically discuss the use and abuse of alcohol in man.

(1.5+1.5)

iv. Sinusitis and Otitis Media, both are the disorders of upper respiratory tract. Identify how Otitis Media differs from Sinusitis in terms of causes and symptoms.

(1.5+1.5)

OR

A patient with excruciating lower back pain that was travelling to the leg was found not to have a joint or muscle issue. Indicate what might be the issue. Give a brief explanation of the disorder and its causes.

(0.5+2.5)

v. How do certain terrestrial mammals adapt to live without drinking water for a long time?

OR

Identify the parts of the brain involved in the following activities:

(0.5×6)

- Feeling of hate and rage
- Maintains homeostasis
- Releases dopamine
- Blood pressure
- Interpretation of memory
- Coordinated actions of body

vi. Which lobe of pituitary gland is said to be the master gland and why?

(0.5+2.5)

OR

Justify that cytoplasmic components are responsible for cell differentiation during embryonic development.

vii. Identify the effect of over-secretion of the following hormones in the human body.

- GH
- ADH
- T3 and T4

(1+1+1)

OR

Discuss briefly the following anomalies that are derived from mothers in new ones.

- Neural Tube Defects (NTDs)
- Thyroid gland disorder

(1.5+1.5)

viii. In a pride of lions, only one male is responsible for defending his territory from other males of the species and other predators. Suggest the type of behaviour shown by that lion and briefly discuss it.

OR

(0.5+2.5)

Differentiate between miscarriage and abortion.

ix. State the significance of the following parts in the human reproductive system:

- Cervix
- Epididymis

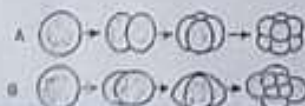
(1.5+1.5)

OR

Determine the factors responsible for the physiological changes that are undesirable and negative to the human body.

x. Compare the two types of cleavage patterns shown in the diagram below (any two differences)

(1+2)



OR
Compare semiconservative and dispersive models of replication with the help of labeled diagram only.

- xi. Justify that healthy eating is imperative during the third trimester of pregnancy.

OR

Two insects with long wings were crossed and the offspring included 36 with long wings and 12 with short wings.

- What is the phenotype ratio of the offspring?
- Which trait is dominant?
- Looking at the phenotypic ratio, predict the genotypes of the parents?

- xii. In complete dominance and epistasis one gene suppresses or masks the effect of other gene and expresses itself phenotypically, but both phenomena (dominance and epistasis) are categorized differently, why?

OR

Critically analyze the experiments of T.H. Morgan in support of Correns' work.

- xiii. Justify the statement: "The genetic codes are universal but the universality of genetic coding is not always observed."

OR

The nitrogenous bases in nucleotides of DNA and RNA are similar in eukaryotes and prokaryotes. What information are you getting from this observation? Discuss briefly.

- xiv. Mendel performed a cross using a true-breeding pea plant with round, yellow seeds and a true-breeding pea plant with green, wrinkled seeds. What is the probability that the offspring will have green, round seeds? Calculate the probability (using test cross/Punnett square) for the F₁ and F₂ generations.

OR

Use your knowledge of speciation to answer the questions:

(1.5+1.5)

- Which type of speciation is most common and why?
- Sympatric speciation is more common in plants. Why?

SECTION - C (Marks 26)

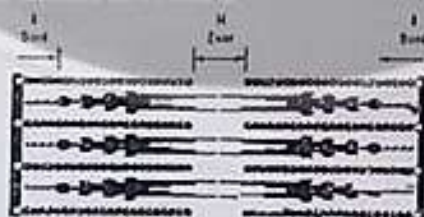
Note: Attempt all questions. Marks for each question are given within brackets.

- Q-3: Identify the part of the kidney which is responsible for urine formation in man. Discuss the mechanism of urine formation by the part in detail with the help of a diagram. (0.5+3.5+3)

OR

How does synaptic transmission contribute to neural conduction and information processing in the nervous system? Support your answer with the help of diagrammatic elaboration. (3+4)

- Q-4: What information are you getting from the diagram given below? describe the mechanism with reference to conditions labeled as A and B. (1+5)



A



B

OR

Analyze the role of hormones in the female reproduction cycle.

(6)

- Q-5: What factors are believed to be responsible for uterine contraction at the termination of pregnancy? Discuss in detail.

OR

(7)

Discuss the genetic basis of ABO blood group system.

(7)

- Q-6: Apply your knowledge of genetics to discuss gene/point mutation due to base substitution with the help of an example.

OR

(6)

Why creationism is contradictory to the theory of evolution?

(6)