

STR-12-BIOLOGY-EM-MODEL-QUATERLY QUESTION PAPER- 2023

TIME Allowed : 3.00 Hours]

[Maximum Marks : 70

Instruction: (1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.

(2) Use Blue or Black ink to write and underline and pencil to draw diagram.

Part – I (BIO-BOTANY) (Marks : 35)

Section - 1

Note: (i) Answer all the questions.

(8x1=8)

(ii) Choose the most appropriate answer from the given four alternatives and write the option code and their corresponding answer.

- How many different kinds of gametes will be produced by a plant having the genotype AABbCC?
 - Three
 - Four
 - Nine
 - Two
- Parthenocarpic fruits lack
 - Endocarp
 - Epicarp
 - Mesocarp
 - Seed
- Which one of the following is an example of polygenic inheritance?
 - Flower colour in *Mirabilis Jalapa*
 - Production of male honey bee
 - Pod shape in garden pea (*Bot*)
 - Skin Colour in humans (*Zoo*)
- "Gametes are never hybrid". This is a statement of
 - Law of dominance
 - Law of independent assortment
 - Law of segregation
 - Law of random fertilization
- The process of recombinant DNA technology has the following steps
 - Amplification of the gene.
 - Insertion of recombinant DNA into the host cells.
 - Cutting of DNA at specific location using restriction enzyme.
 - Isolation of genetic material (DNA) Pick out the correct sequence of step for recombinant DNA technology
 - II, III, IV, I
 - IV, II, III, I
 - I, II, III, IV
 - IV, III, I, II
- Genetic engineering is
 - making artificial genes.
 - hybridization of DNA of one organism to that of the others.
 - production of alcohol by using micro organisms.
 - making artificial limbs, diagnostic instruments such as ECG, EEG etc.,
- Match the following:

Column A	Column B
1. Exonuclease	a. add or remove phosphate
2. Endonuclease	b. binding the DNA fragments
3. Alkaline Phosphatase	c. cut the DNA at terminus
4. Ligase	d. cut the DNA at middle

 - 1-a, 2-b, 3-c, 4-d
 - 1-c, 2-d, 3-b, 4-a
 - 1-a, 2-c, 3-b, 4-d
 - 1-c, 2-d, 3-a, 4-b
- A free living nitrogen fixing cyanobacterium which can also form symbiotic association with the water fern *Azolla*
 - Nostoc*
 - Anabaena*
 - Chlorella*
 - Rhizobium*

SECTION – 2

Note: Answer any four of the following questions.

(4x2=8)

9. Differentiate incomplete dominance and codominance.



- From the above figure identify the type of mutation and explain it.
- What is vivipary? Name a plant group which exhibits vivipary.
- What are ecological equivalents? Give one example.
- Name the chemicals used in gene transfer.
- Define Genetics.

SECTION – 3

Note: Answer any three of the following questions. Q. No. 19 is compulsory.

(3x3=9)

- "Endothecium is associated with dehiscence of anther" Justify the statement.
- A detached leaf of *Bryophyllum* produces new plants. How?
- How is anemochory differ from zoochory?
- Mention the name of man-made cereal. How it is formed?
- List out the functions of tapetum.

SECTION – 4

Note: Answer all the questions.

(2x5=10)

- Is there any possibility to transfer a suitable desirable gene to host plant without vector? Justify your answer (or)
 - How will you identify a vector?
- Mention the application of Biotechnology. (or)
 - Explain the mechanism of crossing over.

Part – II (BIO-ZOOLOGY) (Marks : 35)
Section - 1

Note: (i) Answer all the questions.

(8x1=8)

(ii) Choose the most appropriate answer from the given four alternatives and write the option code and their corresponding answer.

- Select the incorrect action of hormonal contraceptive pills from the following.
 - Inhibition of spermatogenesis.
 - Inhibition of ovulation.
 - Changes in cervical mucus impairing its ability to allow passage and transport of sperms.
 - Alteration in uterine endometrium to make it unsuitable for implantation.
- Assertion : Offsprings produced by asexual reproduction are genetically identical to the parent.
Reason : Asexual reproduction involves only mitosis and no meiosis.
 - If both A and R are true and R is correct explanation for A
 - If both A and R are true but R is not the correct explanation for A
 - If A is true but R is false
 - If both A and R are false
- Klinefelters' syndrome is characterized by a karyotype of
 - YYY
 - XO
 - XXX
 - XXY
- Which of the following is incorrect regarding ZW-ZZ type of sex determination?
 - It occurs in birds and some reptiles
 - Females are homogametic and males are heterogametic
 - Males produce one types of gamete
 - It occurs in gypsy moth
- Which of the following phenotypes is not possible in the progeny of the parental genotypic combination IA^I° x IAIB?
 - AB
 - O
 - A
 - B
- Which of the following was the contribution of Hugo de Vries?
 - Theory of mutation
 - Theory of natural Selection
 - Theory of inheritance of acquired characters
 - Germplasm theory
- The age of fossils can be determined by
 - electron microscope
 - weighing the fossils
 - carbon dating
 - analysis of bones
- ABO blood group in man is controlled by
 - Multiple alleles
 - Lethal genes
 - Sex linked genes
 - Y-linked genes

SECTION – 2

Note: Answer any four of the following questions.

(4x2=8)

- Expand the following: a) ZIFT b) ICSI
- What is inhibin? State its functions.
- Why tRNA is called an adapter molecule?
- What are holandric genes?
- Give reasons: Genetic code is 'universal'.
- Write the preventive measures of STDs.

SECTION – 3

Note: Answer any three of the following questions. Q.No. 19 is compulsory.

(3x3=9)

- How is the two stage process of protein synthesis advantageous?
- What is colostrum? Write its significance.
- Placenta is an endocrine tissue. Justify
- Distinguish between structural gene, regulatory gene and operator gene.
- Give reasons for the following:
 - Some organisms like honey bees are called parthenogenetic animals.
 - A male honey bee has 16 chromosomes where as its female has 32 chromosomes.

SECTION – 4

Note: Answer all the questions.

(2x5=10)

- a) In E.coli, three enzymes beta-galactosidase, permease and transacetylase are produced in the presence of lactose. Explain why the enzymes are not synthesized in the absence of lactose. (or)
b) Taking the example of Peppered moth, explain the action of natural selection. What do you call the above phenomenon?
- a) What are the strategies to be implemented in India to attain total reproductive health? (or)
b) Explain the three major categories in which fossilization occur?