

(3)

XII BIOLOGY

Part - II Bio-Zoology

Marks: 35

Section - 1

8×1=8

Note: i) Answer all the questions.

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

- 1) The first ejaculation of the semen
 - a) Orchidectomy
 - b) Infertility
 - c) Spermache
 - d) Azoospermia
- 2) Allergy involves
 - a) IgA
 - b) IgD
 - c) IgE
 - d) IgM
- 3) Right to clean water is a fundamental right under the Indian constitution
 - a) Article 21
 - b) Article 12
 - c) Article 31
 - d) Article 41
- 4) Which one of the enzymes used for removing oil stains from the clothes
 - a) Cellulase
 - b) Pectinase
 - c) Protease
 - d) Lipase
- 5) Predation and Parasitism are which type of interactions
 - a) (+, +)
 - b) (+, 0)
 - c) (-, -)
 - d) (+, -)
- 6) The genetic code GAG codes for an amino acid
 - a) Valine
 - b) Threonine
 - c) Glutamic Acid
 - d) Proline
- 7) Father of a child is colourblind and the mother is a carrier for Daltonism the probability of the child being Daltonism is
 - a) 25%
 - b) 100%
 - c) 50%
 - d) 75%
- 8) The Neanderthal man had the brain capacity of
 - a) 1400 cc
 - b) 650 cc
 - c) 1200 cc
 - d) 900 cc

Section - 2

Answer any four of the followings:-

4×2=8

- 9) Differentiate spermiogenesis and spermatogenesis
- 10) Which are called Nonsense Codon in Genetic Code?
- 11) Define Haematopoises
- 12) What do you mean by Gene Knock Out?
- 13) Give the characters of Biome.
- 14) Define BOD.

(4)

XII BIOLOGY

Section - 3

Answer any three of the following including Q.No.19 is compulsory: $3 \times 3 = 9$

- 15) Differentiate Monozygotic and Dizygotic Twins
- 16) How is Sex is determined in Human beings?
- 17) Draw and label the structure of Lymph Node
- 18) Mention the advantages of cloning.
- 19) Describe any three methods of disposal of radioactive wastes.

Section - 4

Answer In Details:-

 $2 \times 5 = 10$

- 20) a) Describe the structure of Uterus
[or]
b) In E-Coli, three enzymes B galactosidase, permease and transacetylase are produced in the presence of lactose. Explain why the enzymes are not produced in the absence of Lactose.
- 21) a) Mention the major threats to Biodiversity caused by human activities explain.
[or]
b) Differences between r related and k related species.

COMMON HALF YEARLY EXAMINATION – 2024

STANDARD – XII

BIO - ZOOLOGY

Section – 1

1. c) Spermarche
2. c) IgE
3. a) Article 21
4. d) Lipase
5. d) (+, -)
6. c) Glutamic Acid
7. c) 50 %
8. a) 1400 cc

Section – 2

9.

Spermiogenesis	Spermatogenesis
The spermatids are transformed into mature spermatozoa (sperms) by the process called spermiogenesis	Spermatogenesis is the sequence of events in the seminiferous tubules of the testes that produce the male gametes, the sperms

10. UAA, UAG and UGA) codons are designated as termination (stop) codons and also are known as “non-sense” codons
11. The process of production of blood cells in the bone marrow is called haematopoiesis.
12. A gene ‘knock out’ is a genetically engineered organism that carries one or more genes in its chromosomes that have been made inoperative.
13. **Characters of a Biome**
 - Location, Geographical position (Latitude, Longitude)
 - Climate and physiochemical environment
 - Predominant plant and animal life
 - Boundaries between biomes are not always sharply defined. Transition or transient zones are seen as in case of grassland and forest biomes
14. BOD - Biochemical oxygen demand or Biological oxygen demand refers to the amount of the oxygen that would be consumed, if all the organic matter in one litre of water were oxidized by bacteria

Section – 3

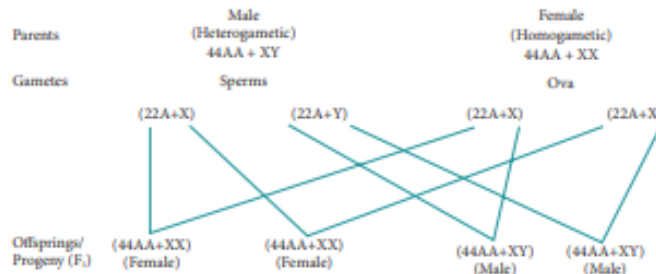
15.

Monozygotic Twins	Dizygotic Twins
Monozygotic (Identical) twins are produced when a single fertilized egg splits into two during the first cleavage. They are of the same sex, look alike and share the same genes.	Dizygotic (Fraternal) twins are produced when two separate eggs are fertilized by two separate sperms. The twins may be of the same sex or different sex and are non-identical

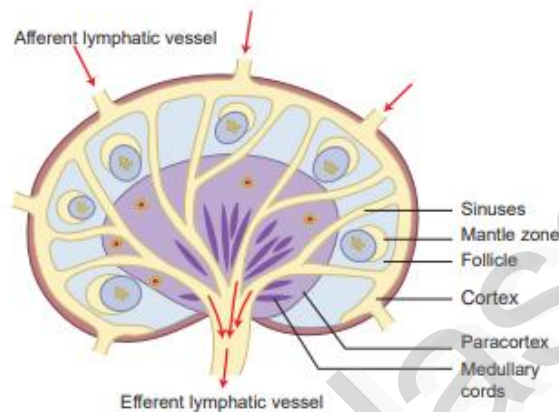
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16. Sex Determination in Human beings

Genes determining sex in human beings are located on two sex chromosomes, called allosomes. In mammals, sex determination is associated with chromosomal differences between the two sexes, typically XX females and XY males. 23 pairs of human chromosomes include 22 pairs of autosomes (44AA) and one pair of sex chromosomes (XX or XY). Females are homogametic producing only one type of gamete (egg), each containing one X chromosome while the males are heterogametic producing two types of sperms with X and Y chromosomes



17.



18. Advantages of cloning:

- Offers benefits for clinical trials and medical research. It can help in the production of proteins and drugs in the field of medicine.
- Aids stem cell research.
- Animal cloning could help to save endangered species.

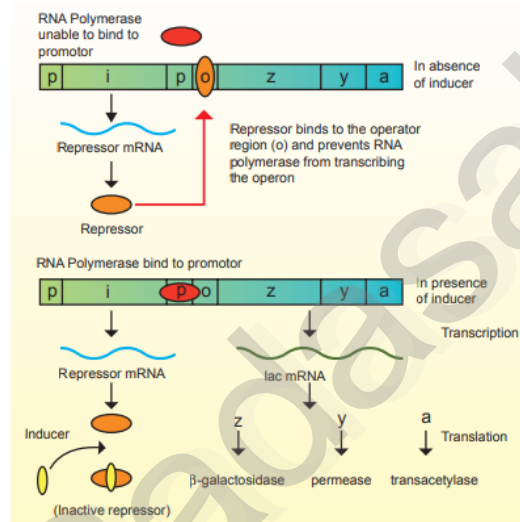
19. Methods of disposal of radioactive wastes (Any 3)

- Limit generation** - Limiting the generation of waste is the first and most important consideration in managing radioactive wastes.
- Dilute and disperse** - For wastes having low radioactivity, dilution and dispersion are adopted.
- Delay and decay** - Delay and decay is frequently an important strategy because much of the radioactivity in nuclear reactors and accelerators is very short lived.
- Concentrate and confine process** - Concentrating and containing is the objective of treatment activities for longer lived radioactivity. The waste is contained in corrosion resistant containers and transported to disposal sites. Leaching of heavy metals and radio nuclides from these sites is a problem of growing concern.

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Section - 4**20. a) Structure of Uterus:**

- The uterus or womb is a hollow, thick walled, muscular, highly vascular and inverted pear shaped structure lying in the pelvic cavity between the urinary bladder and rectum.
- The major portion of the uterus is the body and the rounded region superior to it, is the fundus.
- The uterus opens into the vagina through a narrow cervix.
- The cavity of the cervix called the cervical canal communicates with the vagina through the external orifice and with the uterus through the internal orifice.
- The cervical canal along with vagina forms the birth canal.
- The wall of the uterus has three layers of tissues.
- The outermost thin membranous serous layer called the perimetrium, the middle thick muscular layer called myometrium and the inner glandular layer called endometrium.
- The endometrium undergoes cyclic changes during the menstrual cycle while myometrium exhibits strong contractions during parturition

b) The Lac (Lactose) operon:

- The metabolism of lactose in E.coli requires three enzymes – permease, β -galactosidase (β -gal) and transacetylase.
- The enzyme permease is needed for entry of lactose into the cell, β -galactosidase brings about hydrolysis of lactose to glucose and galactose, while transacetylase transfers acetyl group from acetyl Co A to β -galactosidase.
- The lac operon consists of one regulator gene ('i' gene refers to inhibitor) promoter sites (p), and operator site (o).
- Besides these, it has three structural genes namely lac z,y and lac a.
- The lac 'z' gene codes for β -galactosidase, lac 'y' gene codes for permease and 'a' gene codes for transacetylase.
- Jacob and Monod proposed the classical model of Lac operon to explain gene expression and regulation in E.coli.
- In lac operon, a polycistronic structural gene is regulated by a common promoter and regulatory gene.
- When the cell is using its normal energy source as glucose, the 'i' gene transcribes a repressor mRNA and after its translation, a repressor protein is produced.

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- It binds to the operator region of the operon and prevents transcription; as a result, β -galactosidase is not produced.
- In the absence of glucose, if lactose is available as an energy source for the bacteria then lactose enters the cell as a result of permease enzyme.
- Lactose acts as an inducer and interacts with the repressor to inactivate it.
- The repressor protein binds to the operator of the operon and prevents RNA polymerase from transcribing the operon.
- In the presence of inducer, such as lactose or allolactose, the repressor is inactivated by interaction with the inducer.
- This allows RNA polymerase to bind to the promoter site and transcribe the operon to produce lac mRNA which enables formation of all the required enzymes needed for lactose metabolism.

21. a) Threats to biodiversity:

- Threats to biodiversity Even though India is one of the 17 identified mega diverse countries of the world, it faces lots of threats to its biodiversity.
- Apart from natural causes, human activities, both directly and indirectly are today's main reason for habitat loss and biodiversity loss.
- Fragmentation and degradation due to agricultural practices, extraction (mining, fishing, logging, harvesting) and development (settlements, industrial and associated infrastructures) leads to habitat loss and fragmentation leads to formation of isolated, small and scattered populations and as endangered species.
- Some of the other threats include specialised diet, specialized habitat requirement, large size, small population size, limited geographic distribution and high economic or commercial value. Large mammals by virtue of their size require larger areas to obtain the necessities of life - food, cover, mates than do smaller mammals.
- Individual home range of Lion can be about 100 square Km.
- Mammals have specialized dietary needs such as carnivores, frugivores and the need to forage over much larger areas than general dietary herbivores and omnivores.
- Mammals also have low reproductive output other than small rodents

b) Differences between r- selected and K selected species:

S.No	r selected species	K selected species
1.	Smaller sized organisms	Larger sized organisms
2.	Produce many offspring	Produce few offspring
3.	Mature early	Late maturity with extended parental care
4.	Short life expectancy	Long life expectancy
5.	Each individual reproduces only once or few times in their life time	Can reproduce more than once in lifetime
6.	Only few reach adulthood	Most individuals reach maximum life span
7.	Unstable environment, density independent	Stable environment, density dependent

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