Karnataka Board

Biology

Class 12

Instructions:

i**) The question paper consists of four parts – A, B, C, and D. Part – D consists of two sections – Section I and Section II.**

ii) All the Parts are compulsory

iii) Draw diagrams wherever necessary. Unlabelled diagrams or illustrations do not attract any marks.

PART – A

Answer the following questions in one word or in one sentence each. [10X1=10

1. What is Bio magnification?

Ans: The increasing concentration of a substance, such as a toxic chemical, in the tissues of organisms at successively higher levels in a food chain.

2. Name a causative organism of pneumonia.

Ans: Streptococcus is causative organism of pneumonia**.**

3. Give an example for adaptive radiation.

Ans: Darwin observed an amazing diversity of creature in Galapagos Islands. They represented one of the best examples of adaptive radiation. Of all the varieties of finches, which were observed in the same island, he found that all of them had evolved from original seed-eating finches.

4. Define parthenogenesis.

Ans: :Parthenogenesis is defined as the development of female remix into new individual without fertilization The megaspore Mother cell undergoes use usual neurotic division to form haploid egg and embryo develops from its without fertilization .

5. Papaya plants exhibit xenogamy only. Why?

Ans: In normal plant male and female part of a plant are present on a same plant but in case of papaya, male and female reproductive organs are present on two different plants which is why papaya plant exhibit xenogamy.

6. What is detritus?

Ans: Detritus is typically colonized by communities of microorganisms which act to decompose the material. In terrestrial ecosystems, it is encountered as leaf litter and other organic matter which are intermixed with soil, and called as soil organic matter. Detritus of aquatic ecosystems is organic material suspended in water and piling up on seabed floors, which is referred to as marine snow.

7. Mention the use of Cyclosporin A.

Ans: Cyclosporin A is an immunosuppressant drug widely used in post-allogeneic organ transplant to reduce the activity of the patient's immune system and therefore the risk of organ rejection.

8. Name the plant from which cocaine is obtained.

Ans: Cocaine is obtained from the leaves of the coca plant (Erythroxylum coca).

9. Mention the technique used to separate DNA fragments in rDNA technology.

Ans: The cutting of DNA by restriction endonucleases results in the fragment of DNA. The technique which separates DNA fragments based on their sides is called gel electrophoresis.

10. Why is oxytocin necessary for parturition?

Ans: The hormone causes uterine contractions during labor and helps shrink the uterus after delivery.

PART – B

Answer any five of the following questions in 3 to 5 sentences each, wherever applicable: 5X2=10

11. Differentiate menstruat cycle and oestrus cycle.

Ans: **Menstrual cycle –**

It consists of menstrual phase, proliferative phase and the secretory phase. Blood flows in the last few days of this cycle. The broken endometrium is passed out during menstruation.

Oestrus cycle:

It consists of a short period of oestrous or heat (e.g., 12-24 hours in cow) followed by anoestrous or passive period. Blood does into flow in this cycle. The broken endometrium is reabsorbed.Sex urge is increased during oestrousperiod.Female permits copulation only during oestrous period.

12. **Mention any four sexually transmitted diseases**.

Ans: sexually transmitted diseases aqre followings:

- Acquired Immunodeficiency Syndrome (AIDS):
- Human immunodeficiency virus (HIV)
- Bacterial vaginosis: Gardnerellavaginalis
- Chancroid: Haemophilus ducreyi

13. tRNA is an adaptor molecule. Comment.

Ans: tRNA is called an adapter molecule because it attaches itself via initiation and elongation factors to the ribosome- mRNA complex which facilitates the incorporation of the correct amino acid to the growing polypeptide chain by its specific anticodon to the mRNA codon.

14. Distinguish between Bengin tumorand Malignanttumor.

Ans: Bbenign tumor is not a cancerous tumor. This tumor is unable to spread throughout the body. This tumor can be serious if they are pressing a primary nerve, a main artery, or compresses brain matter. Benign tumors respond well to treatment and the prognosis is usually favorable.

Malignant tumors are formed from abnormal cells that are highly unstable and travel through the blood stream, circulatory system, and lymphatic system. Malignant cells do not have chemical adhesion molecules to anchor them to the original growth site that benign tumors possess.

15. List any four hormones secreted by placenta.

Ans: The major hormones secreted by the placenta are:

- Human chorionic gonadotropin
- Estrogen
- Progesterone
- Human placental lactogen
- Placenta serves as the main endocrine organ of pregnancy.

16. What are the conclusions drawn by T. H. Morgan from the crossing experiment in Drosophila with respect to linkage?

Ans: Conclusions drawn by T.H.Morgan from crossing experiments in Drosophila: When the genes are loosely linked show higher recombination and when the genes are tightly linked show low recombination.

17. Discuss the role of fungi as biofertilizers.

Ans: Symbiotic associations exist between plants and fungi too. These associations are called 'Mycorrhizae'. The fungus in this association absorbs phosphorus from the soil and provides it to the plant. Plants that grow with these associations also show other advantageous characteristics such as:

Tolerance to drought conditions and salinity.

Resistance to root-borne pathogens.

An overall increase in plant growth and development.

18. Write a note on single cell protein.

Ans: Single-cell proteins are the dried cells of microorganism, which are used as protein supplement in human foods or animal feeds. Microorganisms like algae, fungi, yeast and bacteria, utilize inexpensive feedstock and wastes as sources of carbon and energy for growth to produce biomass, protein concentrate or amino acids. Since protein accounts for the quantitatively important part of the microbial cells.These microorganisms, arelso called single cell protein.

PART – C

Answer any five of the following questions in about 40 to 80 words each wherever applicable: 5X3=15

19. What is aneuploidy? Write any four symptoms of Down's syndrome.

Ans: Variation in chromosome number involving individual chromosomes is called aneupoidy. Aneupoid plants and animals have incomplete genome. Individual chromosome may either be less than the diploid number or more than dipoid number**.**

Symptoms of Down's syndromeare:

The children at the time of birth are with physical anomalies. They have broad cranium of , short neck, flat hands ,blunt fingers, lower lip bulging lower buzzing below ,Tongue also sticks out of the mouth.

20. RNA polymerases in eukaryotes show division of labour. Substantiate.

Ans: In eukaryotes at least three distinct polymerases are responsible for RNA synthesis.

RNA polymerase 1 found in nucleolus synthesis ribosomal RNA.

RNA polymerase II in nucleoplasm is responsible for the synthesis of messenger RNA.

RNA polymeraseiii in nucleoplasm catalyzed the synthesis of transfer RNA.

21. Suggest any three assisted reproductive technologies to overcome infertility.

Ans: The term Assisted Reproductive Technology is abbreviation is ART. It is often referred to as medically assisted reproduction, assisted conception of fertility care and can be defined as the set of techniques and procedures that replace the natural process of conception.

- Artificial Insemination (AI)-It is the fertility treatment involving the lowest complexity, and the most similar one to natural conception.
- In Vitro Fertilization-This assisted reproductive technology involves fusing an egg cell with a sperm cell in the laboratory. The resulting embryo is then transferred back to the uterus of the patient.
- ICSI-A sperm is selected and inserted into the egg cell with an injection needle.

22. Name asexual reproductive structures in

(i) Hydra

Ans: Bud is the asexual reproductive structures in hydra. Bud It begins to form on the tubular body of an adult Hydra. It develops a mouth and tentacles. 3: The bud detaches from its parent. 4: The new Hydra is fully developed and will find its own location for attachment begins to form on the tubular body of an adult Hydra.

(ii) Chlamydomonas

Ans: Asexual reproductive structures is:

- Zoospores- The zoospore formation takes place during favourable conditions.
- The aplanospores are formed slightly under unfavorable conditions

(iii) **Penicillium.**

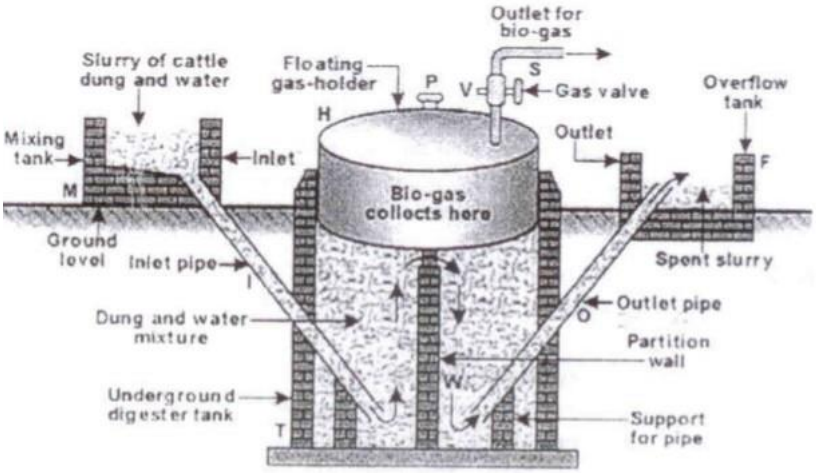
Asexual reproduction takes place by conidia**.** Conidiophore is an erect body developed from any cell of the mycelium. Conidium. Conidiophores bear conidium is a small, ovoid or globose, uninucleate Conidia are dispersed by the wind, and on getting the suitable conditions they germinate into a new mycelium**.**

23. Mention three types of innate barriers of defence with an example each.

Ans: Innate immunity is a part of immune system which exists from birth of an individual. Three types of innate barriers of defence are followings:

- Physical barriers: This includes skin and mucous membranes. Skin cover all the visible and environment exposed areas of the body. It is thick, hard and keratinsed making it tough for any microbes to enter the body through.
- Physiological barriers:, these are the ones which are released or formed as a part of body regular physiology. These include
  a) Saliva in the mouth
  b) Hydrochloric acid in the stomach
  c) Tears in the eyes.
  These three secretions prevent microbes from gaining entry in to the body.
- Cellular barriers:
  These are the immune cells in the body which kill any pathogen roaming inside the body. These include three white blood cells viz.
  a) Neutrophils
  b) Monocytes and
  c) Lymphocytes.

24. Draw a neat labeled diagram of a typical Biogas plant.



BIOGAS PLANT

25. a) What is endemism?

Ans: Endemism is the ecological state of a species being unique to a defined geographic location, such as an island, nation, country or other defined zone, or habitat type. Organisms that are indigenous to a place are not endemic to it if they are also found elsewhere**.**

b) Mention 'The Evil Quarter' of biodiversity loss.

Ans: The major causes that are responsible for the loss of Biodiversity is described or called as 'The Evil Quartet'. The following are the four factors impacting the environment that leads to the loss of Biodiversity:

• Habit Loss and Fragmentation: This is the most important cause driving animals and plants to extinction the ability of biodiversity to survive depends on capacity of particular species to which stand successfully the adverse environmental factors operating in its natural habitat.

• Over- Exploitation- Humans have always dependent on nature food and shelter but we need turns to greed it leads to over exploitation of natural resources.

• Co-extinctions- When a species become extinct the plant and animal species associated with it in an obligatory way also become extinct. For example when a host fishes become extinct its unique assemblage of parasites also meet the same fate.

• Invasion of Alien species- The introduction of Exotic species is called alien species invasion. It deliberately has affected many native species by imposing new factors in competition for food and space, predation, Habitat destruction and degradation, transmission of diseases and parasites.

26. **How Pollination does is achieved in vallisneria and sea grasses**?

Ans: In Vallisneria pollination is through hdrophillyie through water. In Vallisneria, the female flower appear on the surface of the water as it have a long stalk. The pollen grains released by the male flower reaches to female flower for fertilisation through water currents.

In sea grass, the female flowers are seen submerged in water and the pollen grains are released inside the water. Pollen grains are long Ribbon like and they are carried passively inside the water. Some of them reach stigma for pollination.

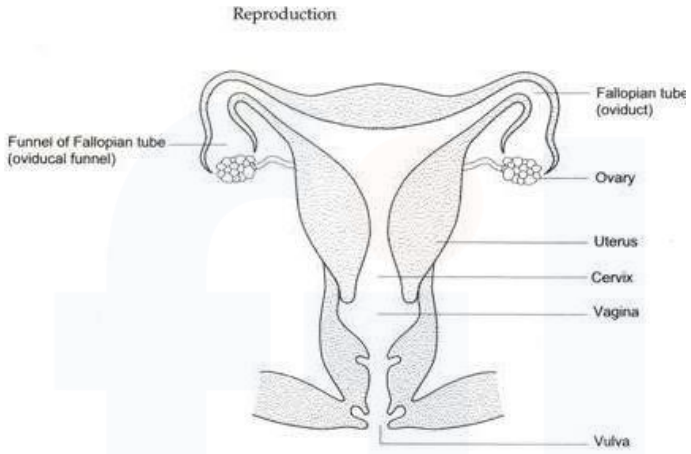
PART – D

Section –I

Answer any four of the following questions in about 200 to 250 words each, wherever applicable: 4X5=20

27. Draw a neat labeled diagram of sectional view of human female reproductive system.

Ans:



FEMALE REPRODUCTIVE SYSTEM

28. A). Write the steps involved in multiple ovulation and embryo transfer.

Ans: MOET (Multiple Ovulation Embryo Transfer Technology) is the technique in which multiple eggs are fertilized in an animal and the embryo is collected on the 7th day, without any surgery. It is the traditional method of embryo production and is practised in cattle.In the process of MOET, the hormones, especially the Follicle Stimulating Hormones are used to stimulate the ovaries of the cycling cattle to induce multiple ovulations. The animal is artificially inseminated and multiple eggs are fertilized in the reproductive tract. After 7 days, the embryos are collected and frozen to transfer later. They may also be transferred as fresh embryos.It is an excellent method of enhancing the genetic potential of the best animals. Normally a cow produces one calf a year. But by using MOET it is possible to produce more than one offspring from the genetically fit cows.

Procedure of MOET Technology. MOET is carried out in the following steps:

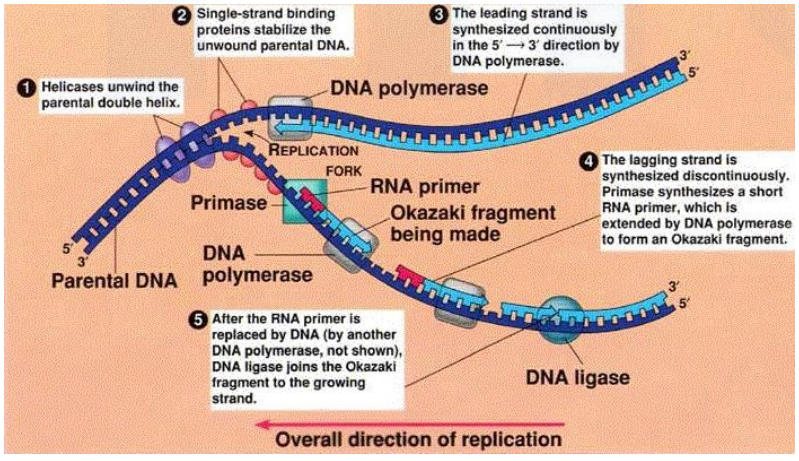
- Programming-The donor cattle are treated with follicle stimulating hormone and prostaglandin. These are injected only in the muscles. The cows need to be provided with proper nutrients before and after calving.
- Heat Detection--Heats need to be accurately recorded while the cows are being artificially inseminated.
- Embryo Collection-The donor and recipient cattle are placed in a secured and covered place. The donor cow is injected with an epidural to relax her bowel. Thus the embryos are collected from the fluid by vetenary doctor. The cow is then injected with prostaglandin after 3 days for proper cycling.
- Embryology- The embryos are either frozen or preserved in liquid nitrogen at -190°C for later use or are transferred into the recipients with the help of transfer guns.
- Embryo Transfer--The recipient cows are injected with an epidural. They are washed and their ovaries observed to check their.

B). Differentiate between out crossing and cross breeding.

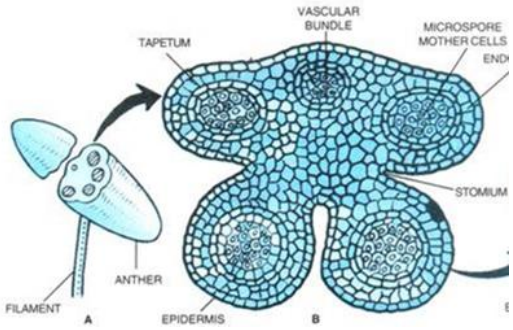
(i). Out crossing : This method involves mating of Animals within the same breed but having no common ancestor on either side of mating parbents up to 4-6 generations as in inbreeding .

(ii)Cross breeding: It is practice of mating superior female of one breed with superior male of another breed. Here two different breeds are crossed that's why it is called as cross breeding

29. Describe the process of DNA replication with the help of a diagram.



30. Explain the transverse section of young anther with a labeled diagram.



T . S. Anther

31. Explain Brood parasitism and 'sexual deceit' as an interaction of species with an example each.

Ans: Brood parasitism is practiced by most species of cuckoos and all cowbirds. Those birds do not build nests of their own but deposit their eggs in the nests of other species and abandon them there, with the hope that adult birds of other species will raise the abandoned young as their own.The cuckoo may remove one or more host eggs to reduce the suspicion surrounding the presence of its egg, and the young cuckoo may heave the host's eggs and nestlings from the nest.

32. **With reference to flower colour in snapdragon, explain incomplete dominance**.

Ans: Mendel's results in crossing peas, black vs brown fur color, and eumelanin production vspheomelanin production all demonstrate traits are inherited as dominant and recessive. This contradicts the historical view that offspring always exhibited a blend of their parents' traits. However, sometimes heterozygote phenotype is intermediate between the two parents. For example, in the snapdragon, Antirrhinum majus. A cross between a homozygous parent with white flowers (C^wC^w) and a homozygous parent with red flowers ($C\ ^RC\ ^R$) will produce offspring with pink flowers ($C\ ^RC^W$). Different genotypic abbreviations are used to distinguish these patterns from simple dominance and recessive genes. The abbreviation C^w can be read as "at the flower color gene (C), the white allele is present." This pattern of inheritance is described as incomplete dominance, meaning that neither of the alleles is completely dominant over the other: both alleles can be seen at the same time. The allele for red flowers is incompletely dominant over the allele for white flowers. Red + white = pink. The results of a cross where the alleles are incompletely dominant can still be predicted, just as with complete dominant and recessive crosses.

SECTION – II

Answer any three the following questions in about 200 to 250 words each, wherever applicable: 3X5=15

33. Give the diagrammatic representation of Miller's experiment.

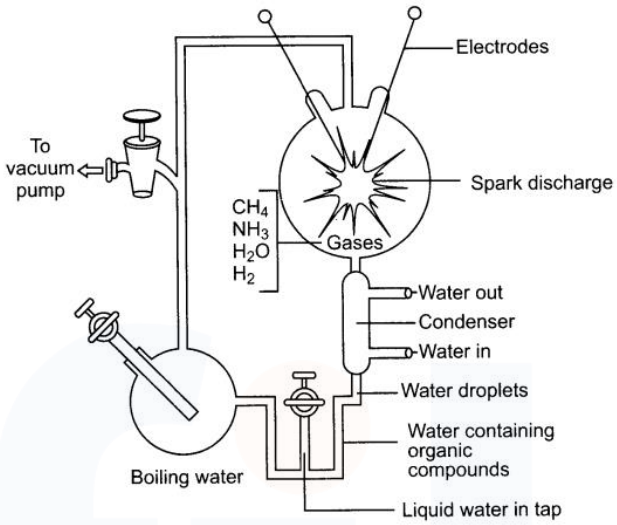


Diagram showing Millers's experiment

34. a) Development of Bt Cotton has reduced the use of insecticides. Justify. 3

Ans: BT crops are insect resistant transgenic crops carrying BT toxin genes which are very effective in controlling insect damage which reduces the health risks.Bt cotton can avoid up to 9 million poisoning incidences per year, which translates into a health cost saving of 51 million USThe main reason for these health benefits of Bt technology is that the inbuilt resistance against major insect pests allows high cotton yields with much lower levels of chemical insecticides. As smallholder farmers spray pesticides manually, usually with insufficient protective clothing, lower pesticide use means lower exposure to toxic chemicals. Pesticide use models, which estimated with fixed-effects specifications, show that Bt cotton has reduced pesticide use by 50 percent, with savings increasing over time.

b) Write a note on gene therapy. 2

Ans: Gene therapy can be defined as the treatment of a genetic disorder by replacing a defective gene with a normal gene in the cells of an affected tissue of a person in order to restore the normal cellular functions. Two types of gene therapies have been recognized: (1) germ cell gene therapy and (2) somatic cell gene therapy.

35. Explain the features of cloning vectors.

Ans: Plasmids and bacteriophages have the ability to replicate within bacterial cells independent of control of chromosomal DNA .Plasmids may have only one or two copies per cell whereas phages because of their High number per cell have a very high copy number of their genome within the bacterial cell .Vectors used at present are engineered in such a way that they help easy linkage of foreign DNA and selection of recombinants from non-Recombinant.

Plasmids- These are small circular duplex DNA molecule and their natural function is to confirm antibiotic resistance to host cell. They have several properties that make them extremely useful as cloning vector. In the recombinant DNA technology Eukaryotic or prokaryotic DNA as well as plasmid DNA is cut into specific fragments with restriction enzymes .The foreign DNA fragment can be made to recombine with plasmid DNA and the product is known as Recombinant DNA.

Phages – These a usually have linear DNA molecule which into foreign DNA can be inserted at several restriction enzyme sites.

Plasmids and viruses which are used as career of foreign DNA are known as vector by interchanging plastic DNA viral DNA fragments revenue factors have been synthesized which carry news into Bacteria is insects plants and animal cell. When en such foreign DNA fragment are introduced into the the appropriate host cells, such cells are said to be transformed and process is known as transformation.

36. a) what are the effects of ozone depletion? 3

As ozone depletes in the stratosphere, it forms a 'hole' in the layer. This hole enables harmful ultraviolet rays to enter the Earth's atmosphere. Ultraviolet rays of the Sun are associated with a number of health-related, and environmental issues.Theyare followings;

- Skin cancer: Exposure to ultraviolet rays poses an increased risk of developing several types of skin cancers, including malignant melanoma, and basal and squamous cell carcinoma.
- Eye damage: Direct exposure to UV radiations can result in photokeratitis (snow blindness), and cataracts.
- Immune system damage: Effects of UV rays include impairment of the immune system. Increased exposure to UV rays weakens the response of the immune system.
- There is an increase in the ozone present in the lower atmosphere due to the decrease in the ozone in the stratosphere. Ozone present in the lower atmosphere is regarded as a pollutant and a greenhouse gas that can contribute to global warming and climate change.

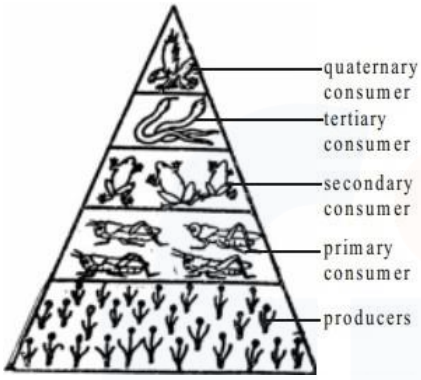
b) BOD is an index of water pollution. Comment. **2**

Ans: Organic pollutants, even if they have no toxicity, are one of the causes of water pollution because they will have an effect on the dissolved oxygen level in the water. This effect is called BOD or biochemical oxygen demand.

37. a) What is ecological succession? **1**

Ans: Ecoogical succession, the process by which the structure of a biological community evolves over time. There are two different types of succession primary and secondary succession.

b) Represent an ideal pyramid of number in a grassland ecosystem. **2**



GRASSLAND

c) Name the two types of nutrient cycles with an example each. **2**

Ans: Geochemical cycles: exchanges of chemicals between ecosystems.

Biogeochemical cycles: redistribution of chemicals within individual organisms.

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