Important snaps by Team PIS Class- XII

SUBJECT : BIOLOGY

TEACHER : MS.MONIKA

Chapter 1
REPRODUCTION IN ORGANISMS

- **Q1. Why are the offsprings produced by asexual reproduction referred to as clones ?**
- **A**. During asexual reproduction, there is no fusion of gametes and a single parent divides and redivides to produce the offsprings. Hence, the offsprings are morphologically and genetically similar to the parents and therefore referred to as clones.
- **Q2. Name the most invasive aquatic plant weed which is called as Terror of Bengal.**
- **A.** Water hyacinth (Eicchornia)

Q3. What are the changes that take place in an angiosperm after pollination and fertilization have occurred?

A. Following are the changes that occur in an angiosperm after pollination and fertilization:

a) The sepals, petals and stamens fall off.
b) The zygote is converted into an embryo.
c) The embryo is present in the ovule. Ovule forms the seed.
d) Ovary wall develops into pericarp.
e) Ovary forms the fruit.

Chapter 2 SEXUAL REPRODUCTION IN FLOWERING PLANTS

- **Q1. How do self-incompatibility restrict autogamy? How does pollination occur in such plants?**
- **A.** Self-incompatibility restricts autogamy by a mechanism known as self-sterility. This is a genetic mechanism in which the germination of pollen grains or the pollen tube growth in the pistil is inhibited which prevents the pollen from fertilizing the ovules. Such plants pollinate by the process of cross-pollination.
- **Q2. How is parthenocarpy different from apomixis ?**
- **A.** In parthenocarpy, the fruit is produced without the fertilization of the female gamete. It is used for the production of fruits without seeds such as banana and grapes for commercial purposes. Apomixis is the process in which the seeds are produced without fertilization but the process occurs in the female reproductive tract of the plant. In this, the megaspore mother cell does not undergo meiosis. It is used for the commercial production of hybrid varieties and in the production of virus-free varieties.
- **Q3. Name the most invasive aquatic plant weed which is called as Terror of Bengal.**
- **A.** Water hyacinth (Eicchornia)

Chapter 3
HUMAN REPRODUCTION

- **Q1.What is foetal ejection reflex? How does it cause parturition?**
- **A.** Foetal ejection reflex is the mild uterine contractions that arise from the parturition signals from the fully developed fetus and the placenta. This reflex stimulates the release of oxytocin, which causes uterine contractions, in turn, stimulating the increased secretion of oxytocin. This action of uterine contractions and oxytocin secretion further results in stronger contractions leading to the dilation and hence expulsion of the baby out of the uterus through the cervical canal, expelling placenta along, thus the parturition or childbirth.
- **Q2. Why is breastfeeding recommended during the initial stages of infant growth?**
- **A.** The mammary glands in females start producing milk towards the end of pregnancy through the process of lactation which helps the mother feed the newborn. Colostrum is the milk produced during the initial few days. Colostrum contains antibodies which are crucial in developing resistance in the newborns, hence it is recommended by doctors to bring up a healthy baby.
- **Q3. State the significance of cervix in the female reproductive system.**
- **A.** The cervix is a narrow opening through which the uterus opens up to the vagina. The cervical canal is the cavity of the cervix which alongside the vagina goes on to form the birth canal.

Chapter 4
REPRODUCTIVE HEALTH

- **Q1. After a successful in vitro fertilisation, the fertilised egg begins to divide. Where is this egg transferred before it reaches the 8-celled stage and what is this technique called?**
- **A.** Fallopian tube; Zygote intra fallopian transfer (ZIFT)
- **Q2. Briefly explain two natural barriers for birth control.**
- **A.** Periodic abstinence couple should avoid coitus from 10th to 17th day of menstrual cycle. Coitus interruptus Male partner withdraws his penis from the vagina just before ejaculation of semen.
- **Q3. Suggest some means of Assisted Reproductive Technologies to assist infertile couples to have children?**
- **A.** Test tube Baby Programme :- In this method, ova from wife or donor female & Sperm from husband are allowed to fuse under simulated conditions in the laboratory it is called In-vitro fertilization (IVF). The zygote is then transferred into uterus or fallopian tube this process is called embryo transfer (ET)

Gamete Intra fallopian Transfer (GIFI) :- It involves transfer of an ovum collected from a donor female into another female who cannot produce ova but can provide suitable condition for fertilization

Artificial Insemination: – In this method semen is collected from the husband or a healthy donor & is artificially introduced into vagina or uterus.

Chapter 5 PRINCIPLES OF INHERITANCE AND VARIATION

- **Q1. What is aneuploidy? Differentiate between aneuploidy and polyploidy.**
  A. Aneuploidy is the chromosomal abnormality in which one or more chromosomes are gained or lost during meiosis due to the non-disjunction of chromosomes.

Polyploidy is a type of chromosomal aberration containing an entire extra set of chromosome. It may be triploid or tetraploid. This phenomenon is common in plants. It is, however, lethal in animals.

- **Q2. Why is colour blindness more prominent in males than females?**
- **A.** Colour blindness is a sex-linked disorder and the genes responsible are present on the X-chromosome. To become affected by the disease, the female should possess the alleles for colour blindness on both the X-chromosomes. If the allele is present on only one chromosome, the female becomes a carrier of the disease. Since males have only one X-chromosome, it carrying the allele renders them affected. That is why males are more prone to colour blindness.
- **Q3. What is meant by pedigree analysis ?**
- **A.** The study of an inherited trait in a group of related individuals to determine the pattern and characteristics of the trait, including its mode of inheritance, age of onset, and phenotypic variability is called pedigree analysis.

Chapter 6 MOLECULAR BASIS OF INHERITANCE

- **Q1.Name any three viruses with RNA as the genetic material.**
- **A.** The viruses in which the genetic material is RNA is called the RNA virus. The three examples of the RNA virus.

Influenza Virus, Hepatitis C Virus, Human Immunodeficiency Virus.

Q2. What is an operon? Explain an inducible operon.

A. An operon is the functional unit of DNA that contains a cluster of genes controlled by a single promoter. It consists of the following components:

a) The DNA fragment that transcribes the mRNA.

b) Regulator gene that codes for a repressor protein.

c) Inducer that prevents the repressor from binding to the operator.

d) A promoter where the RNA polymerase binds and initiates the transcription.

e) An operator that is a DNA sequence adjacent to the promoter where the repressor protein binds.

The lac operon of E.coli is an inducible operon.

Chapter 6 MOLECULAR BASIS OF INHERITANCE

- **Q1.Enumerate the post-transcriptional modifications in a eukaryotic mRNA.**
- **A.** Transcription is the process of conversion of DNA to mRNA. The post-transcriptional modifications include:
- Capping at 5'-end
- Poly-A tail at 3'-end
- mRNA splicing
- The 5' cap protects the RNA from ribonuclease. The poly-A tail protects the mRNA from enzymatic degradation. The introns are spliced during mRNA splicing and the exons are joined together to form a continuous sequence that codes for a functional protein.

- **Q2. Retroviruses do not follow central dogma. Comment on this statement**
- A.7. Retroviruses do not follow central dogma, because, they possess RNA as genetic material instead of the DNA, which is later converted into DNA by the enzyme reverse transcriptase.

Chapter 7
EVOLUTION

- **Q1. What are the factors affecting the Hardy-Weinberg equilibrium?**
- A. The factors affecting the Hardy-Weinberg equilibrium are:
  - a) Genetic Recombination
  - b) Gene Flow
  - c) Genetic Drift
  - d) Natural Selection
  - e) Mutation
- **Q2. What is adaptive radiation. Give examples.**
- A.8. Adaptive radiation is the process in which a living organism diversifies from a single ancestor into multiple new forms. This is mainly due to changes in the environment. Darwin's Finches is one fine example of adaptive radiation. The finches of the Galapagos island are seen with a variety of beaks depending upon the type of food they feed on. A single species got adapted to the environmental and nutritional conditions and developed respective beak types over the years.

Chapter 8 HUMAN HEALTH AND DISEASES

- **Q1. Mention the site in the body where the B-cells and T-cells are formed. Give one difference between them.**
- **A.** Both the B-cells and T-cells are formed in the bone marrow. They differ in the site of maturation. B-cells mature in the bone marrow whereas the T-cells mature in the thymus.
- **Q2. Which plant yields cannabinoids? List any two cannabinoids. Name the part of the body that is affected by its consumption.**
- **A.** Cannabinoids are obtained from the inflorescence of the Cannabis Sativa plant. Some of the cannabinoids are – Marijuana, charas, ganja etc. These substances have the potential to interact with the cannabinoid receptors of the body that are located in the brain. It also affects the cardiovascular system of the body.
- **Q3. Name the diagnostic test which confirms typhoid.**
- **A.**Widal test

Chapter 9 STRATEGIERS FOR ENHANCEMENT IN FOOD RESOURCES

- **Q1. Whatis Biofortification? Name the two principle methods of Biofortification.**
- **A.** The process of producing the new and improved quality of crops are termed as the Biofortification. The two principle methods of biofortification are – Selective breeding and Genetic modification.
- **Q2. In animal husbandry programmes, how can success rate of fertilization during artificial insemination be improved?**
- **A.** Through Multiple Ovulation Embryo Transfer(MOET) program, a cow is administered with hormonal treatment so as to produce more than one ovule per cycle. Post artificial insemination, the embryos at 8-32 celled state are then transported to surrogate mothers.
- **Q3.What is the difference between inbreeding and outbreeding animals?**
- **A.** Inbreeding refers to mating with individuals of same species.

  Outbreeding refers to mating between individuals of different species.

Chapter 10 MICROBES IN HUMAN WELFARE

- **Q1.What are interferons?**
- **A.** Proteins released by cells in response to viral infection which they help to combat are called interferons.
- **Q2. What is biochemical oxygen demand (BOD) test? At what stage of Sewage treatment this test is performed?**
- **A.** The BOD test measures the rate of uptake of oxygen by microorganisms in a sample of water.

  Biological treatment or Secondary treatment.
- **Q3. What are statins? Name the microorganism that produces this substance. How is it medically important?**
- **A.** Statins are cholesterol reducing agents.

They are produced by Monascuspurpureus (Yeast) They act by Competitively inhibiting the enzymes responsible for synthesis of cholesterol and are used as blood cholesterol lowering agents.

Chapter 11 BIOTECHNOLOGY : PRINCIPLES AND PROCESSES

- **Q1. Mention two classes of restriction enzymes. Suggest their respective roles.**
- **A.** Exonucleases and endonucleases

  Exonucleases remove nucleotides from the ends of the DNA.

  Endonucleases cut DNA at specific sites beween the ends of DNA.
- **Q2. What are 'Selectable marker'? What is their use in genetic engineering?**
- **A.**A selectable marker is a gene which helps in selecting those host cells which contains thevector& eliminating the non–transformanteg – gene encoding resistance to antibiotics are usefulSelectable markers as they allow Selective growth of transformants only.
- **Q3. Name two commonly used vectors in genetic engineering.**
- **A.** Plasmid and Bacteriophage.

Chapter 11 BIOTECHNOLOGY : PRINCIPLES AND PROCESSES

- **Q1. What is the role of enzyme "Ligase" in genetic Engineering?**
- **A.**Enzyme "Ligase" acts as molecular Suture which helps in joining two pieces of DNA. The Joining process requires ATP as it derive energy to construct phosphodiester bond between cohesive ends.
- **Q2. In recombinant DNA technology, vectors are used to transfer a gene of interest in the host cells. Mention any three features of vectors that are most suitable for this purpose.**
- **A.** (i) Have origin of replication(Ori)

  (ii) Have a selectable marker

  (iii) Have at least one recognition site.
- **Q3. What is Bioreactor?**
- **A.** Bioreactors are large vessels in which raw materials are biologically converted into specificproteins using microbial, plant, animal or human cells.

Chapter 12 BIOTECHNOLOGY AND ITS APPLICATIONS

- **Q1. Which is the first transgenic cow? Which gene was inserted into it?**
- **A.** The first transgenic cow was Rosie. The gene inserted was human alpha-lactalbumin.
- **Q2. What are the disadvantages of GMO?**
- **A.** The disadvantages of GMO are:
  These can harm the insects that are beneficial to our ecosystem.

  a) It is not a natural way to cultivate plants and hence can damage the environment.

  b)It causes unwanted residual effects.

  c) These create more weeds.

  d) It threatens crop diversity.

  e) It increases the cost of cultivation.

  f) It imposes a risk for human health.

Chapter 12 BIOTECHNOLOGY AND ITS APPLICATIONS

- **Q1. What are transgenic animals? Enlist any four areas where they can be used**
- **A..** Transgenic animals are those whose genetic material has been altered by a gene of interest using genetic engineering techniques. Four areas where they can be used are:

  a) Transgenic animals are served as experimental models for the study of various human diseases.

  b) They are used to test vaccines such as polio vaccines.

  c) The gene expressions help scientists to understand the normal expression of genes at various stages of growth and development.

  d) They are used to study the side effects of a particular chemical or drug.

- **Q2. What are antigens and antibodies? Name any two diagnostic kits based on that.**
- **A.** An antigen is a foreign substance that induces an immune response in the body. An antibody is a large Y-shaped protein produced by the plasma cells that neutralize the effect of pathogens such as bacteria and viruses on the immune system. The two diagnostic kits based on this are:

  a) ELISA for HIV

  b) Pregnancy test kits

Chapter 13 ORGANISMS AND POPULATIONS

- **Q1. What is Brood parasitism? Give an example. What adaptation has evolved in this phenomenon?**
- A.Brood parasitism refers to the phenomenon in which one bird species by its eggs in the nest ofanother bird species Evolution has occurred in such a way the eggs of the parasitic birds resemblethose of the host bird in size, colouretc to avoid host bird detecting the foreign eggs & ejecting themfrom the nest e.g. cuckoo bird lays eggs in the nest of crow. It is considered as a parasitic type ofinterspecific interaction because in this relationship the parasite i.e. eggs of cuckoo birds dependson crow's nest for its food & shelter but the crow is harmed because there is competition for limitedfood and shelter amongst the crow's egg & cuckoo's egg thus, in parasitic interspecific interactionthe parasite is benefited while the host is harmed.
- **Q2. How is diapause different from Hibernation?**
- **A**.Diapauses is the phenomenon of spending unfavourable climatic conditions by insects during their development whereas. Hibernation is a phenomenon of spending the winter in a resting or dormant conditions by cold – blooded animals to escape cold by hiding them in hollow tree trunk or burro or caves etc, revealing minimum physiological activity.

Chapter 14
ECOSYSTEM

- **Q1. What is the Ecological Pyramid? What are the three types of ecological pyramids?**
- **A**. An ecological pyramid is a graphical representation of the relationship between the different living organisms at different trophic levels.

The three types of ecological pyramids include:

a) Pyramid of Number , b) Pyramid of Biomass. , c) Pyramid of Energy.

Q2. Who are generally the pioneer species in a Xerarch succession and in a Hyararch succession?

A. Pioneer species in Hydrarch succession are usually the small phytoplanktons and that in Xerarch succession are usually lichens.

Q3. Define standing crop?

A.The amount of living matter or biomass present at every tropic level is known as standing crop.

Q4. Differentiate between primary productivity & secondary productivity?

A.Primary productivity refers to productivity at trophic level i.e. food energy formed by way of photosynthesis using solar energy whereas secondary productivity refers to gross productivity minus losses by way of respiration & decomposition.

Chapter 15 BIODIVERSITY AND CONSERVATION

- **Q1. What is cryopreservation?**
- **A.** Cryopreservation is the storage of materials at ultra – low temperature either by rapid cooling or by grade cooling & simultaneous dehydration at low temp.
- **Q2. Describe at least two approaches each for ex-situ conservation and in situ conservation as a strategy for biodiversity conservation.**
- **A.** In situ conservation :

  (i) Identification and maximum protection of 'hot spots'

  (ii) Legal protection to ecologically rich areas.

  (iii) Biosphere reserves, national parks and sanctuaries

  (iv) Sacred groves.

  Ex situ Conservation :

  (i) Creation of zoological parks, botanical garden, wild life sanctuary

  (ii) Cryopreservation (iii) Seed bank.

Chapter 16 ENVIONMENTAL ISSUES

- **Q1. Discuss briefly the catalytic converter?**
- **A**.Catalytic converters are used in automobiles for reducing of harmful gases. They have expensivemetals like platinum, palladium, rhodium as catalysts. As the exhaust passes through catalytic converter,unburnt hydro-carbons are converted into carbon-dioxide & water; carbon monoxide & nitric oxide arechanged into carbon dioxide & nitrogen gas respectively. Vehicles fitted with catalytic converter shoulduse unleaded petrol as leaded petrol inactivates the catalyst.
- **Q2. How defunct ships do contributes to solid wastes?**
- **A.** Defunct ships contributes to solid wastes. In India & other developing countries, these ships arebroken down for scrap metal. The body of these ships contains toxic materials lake asbestos, tributyltin,mercury, lead, etc. These chemicals are very harmful for worker. It also pollutes coastal areas in vicinityof ship breaking yard.