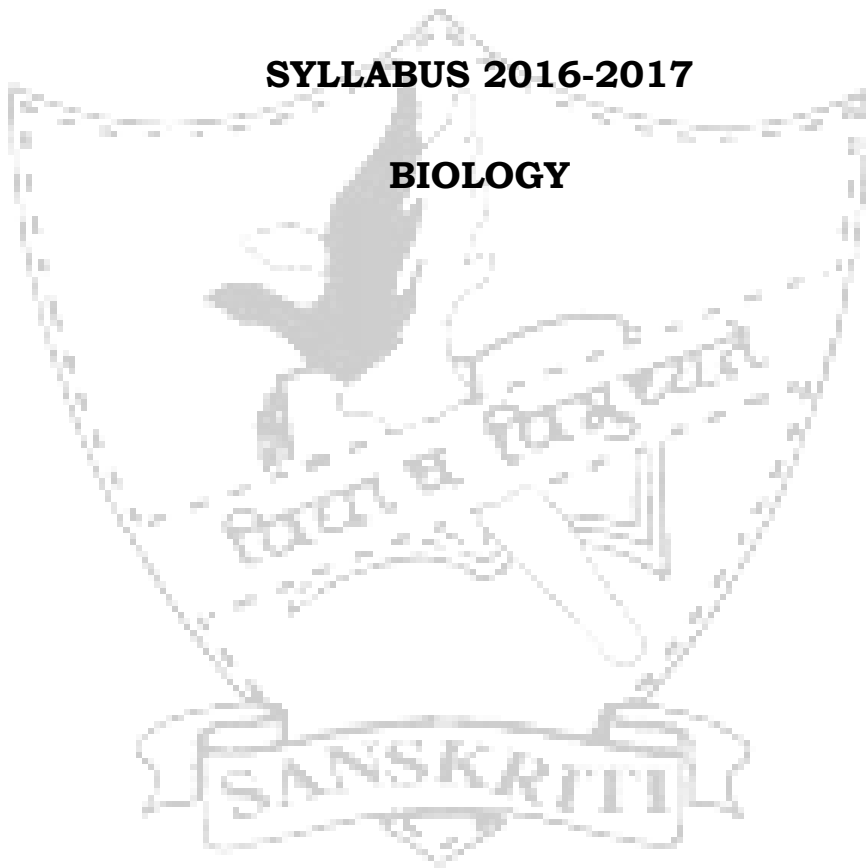


SMART SKILLS

SYLLABUS 2016-2017

BIOLOGY





INDEX**A) SYLLABUS 2016-2017**

- i) Month-wise syllabus
- ii) Unit – wise weight age

B) ASSIGNMENTS

CHAPTER 1:	Reproduction in Organisms
CHAPTER 2:	Sexual Reproduction in Flowering Plants
CHAPTER 3:	Human Reproduction
CHAPTER 4:	Reproductive Health
CHAPTER 5:	Principles of Inheritance and Variation
CHAPTER 6:	Molecular Basis of Inheritance
CHAPTER 7:	Evolution
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CHAPTER 12:	Biotechnology and its applications
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C) SAMPLE PAPERS**D) QUESTION BANK**

SYLLABUS 2016-2017
SUBJECT : BIOLOGY
CLASS XII

MONTH-WISE SYLLABUS

First Semester (March 2016-August 2016)

MARCH 2016

- CHAPTER 1: Reproduction in Organisms
CHAPTER 2: Sexual Reproduction in Flowering Plants

APRIL 2016

- CHAPTER 3: Human Reproduction
CHAPTER 4: Reproductive Health
CHAPTER 5: Principles of Inheritance and Variation

MAY 2016

- CHAPTER 6: Molecular Basis of Inheritance

JULY 2016

- CHAPTER 7: Evolution
CHAPTER 8: Human Health and Disease

AUGUST 2016

- CHAPTER 9: Strategies for Enhancement in Food Production
CHAPTER 10: Microbes in Human Welfare

Second Semester (September 2016- November 2016)

SEPTEMBER 2016

- CHAPTER 11: Biotechnology: Principles and Processes
CHAPTER 12: Biotechnology and its applications

OCTOBER 2016

- CHAPTER 13: Organisms and Populations
CHAPTER 14: Ecosystem

NOVEMBER 2016

- CHAPTER 15: Biodiversity and Conservation
CHAPTER 16: Environmental Issues

SYLLABUS 2016-2017
UNIT - WISE WEIGHTAGE
THEORY

TIME : 3 HOURS

MARKS: 70

UNIT	NAME	MARKS
VI	Sexual reproduction	14
VII	Genetics and Evolution	18
VIII	Biology and Human Welfare	14
IX	Biotechnology and its Applications	10
X	Ecology and Environment	14
TOTAL		70

The Question paper will have Value Based Question (s) to the extent of 3-5 marks.

PRACTICALS

TIME : 3 HOURS

MARKS: 30

CONTENTS	MARKS
1. EXPERIMENTS AND SPOTTING	20
2. RECORD OF ONE INVESTIGATORY PROJECT AND VIVA BASED ON THE PROJECT	5
3. CLASS RECORD AND VIVA BASED ON EXPERIMENTS	5

Chapter 1

REPRODUCTION IN ORGANISMS

1 mark each

1. What is the cause of variations in animals reproducing asexually?
2. Under which group of organisms is asexual reproduction more common?
3. Why are male gametes produced in large quantities in most organisms?
4. What do you understand by juvenile phase?
5. Why do zygotes in Fungi develop a thick wall?

2 marks each

1. Vegetative reproduction is a special kind of asexual reproduction. Justify
2. Name the 'Terror of Bengal'. Why is it called so?
3. What kind of reproduction is seen during favorable and unfavorable conditions? Explain.
4. Plant X is a monoecious plant with unisexual flowers. Give the meaning of the statement. Give one example of such a plant.
5. Discuss the process of reproduction in yeast.
6. Describe any 2 unusual flowering patterns in plants.
7. With the help of examples distinguish between seasonal and continuous breeders.
8. What is embryogenesis? Name the two processes that it involves.

3 marks each

1. Discuss the mechanism of vegetative propagation (natural and cultivated) in plants.
2. Define the following terms: heterothallic, meiocytes, syngamy, pericarp, cell differentiation.
3. What are the disadvantages of external fertilization? Where do you find this phenomenon?

Chapter 2

SEXUAL REPRODUCTION IN FLOWERING PLANTS

1 mark each

1. The chief advantage of vegetative propagation is _____
2. Monocots cannot be propagated by grafting because _____
3. The phenomenon by which plants reproduce by asexual means without fertilization or meiosis is known as _____
4. What is apomixes? _____
5. What is parthenogenesis? _____
6. Differentiate between parthenocarpy and parthenogenesis.
7. What are wind pollinated flowers called? _____
8. What does double fertilization mean? _____
9. _____
10. What is triple fusion? _____
11. The inability of the pollen grain to fertilize the egg in spite of belonging to the same species is called _____

2 marks each

- 1) The figure shows a part of the TS of an anther. Give the functions of the parts.

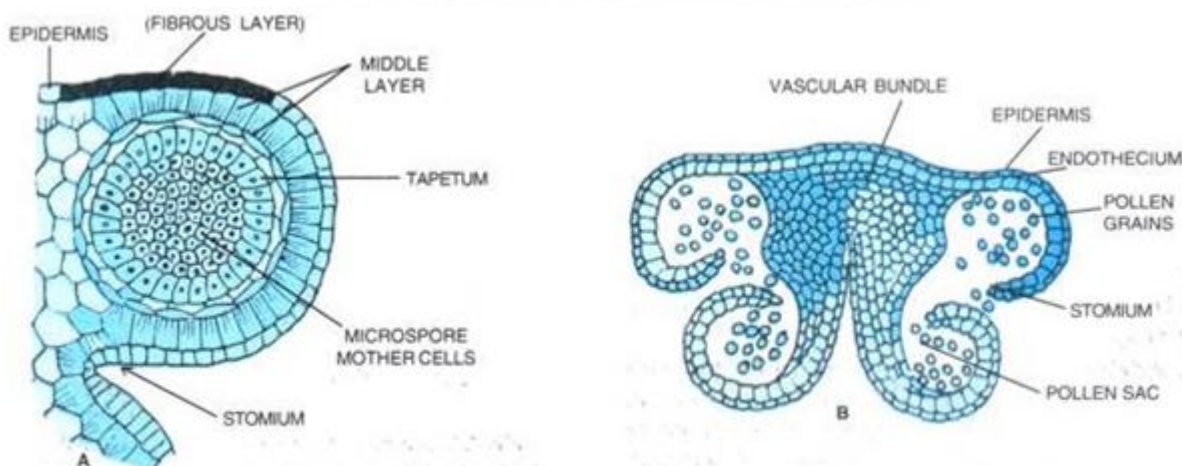


Fig. 2.5. A. Detailed structure of one young pollen sac; B. T.S. mature anther.

- 2) Name the parts of a pollen grain. _____
- 3) Enlist the functions of the tapetum.
- 4) Name the parts of the ovule that are haploid. _____
- 5) Enlist the characteristics of entomophilous flowers –
- 6) After penetrating the stigmatic tissues, how do the pollen tube grow towards the egg? _____

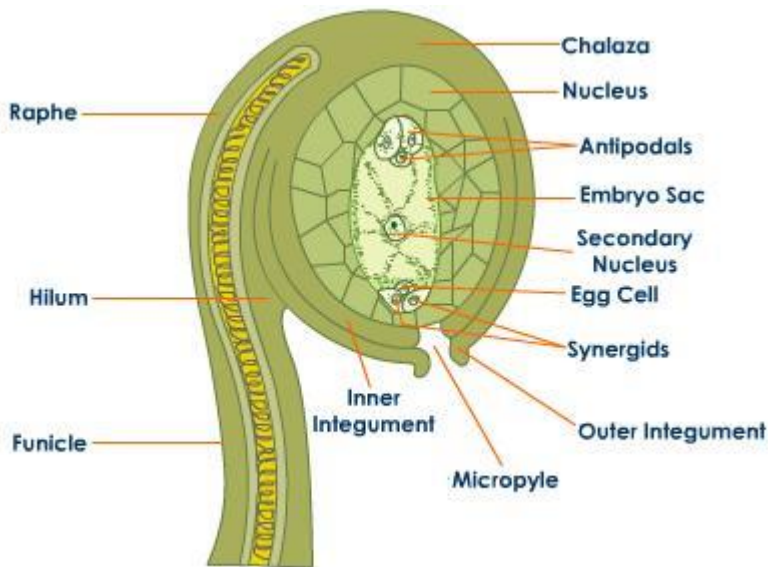
5 marks each

1)



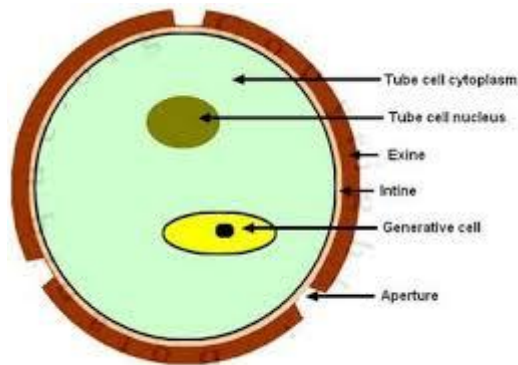
- a. Identify the structure drawn above.
- b. Along which area will the structure burst open to release the content?
Under what condition will this happen?

- 2) The diagram shows the structure of an ovule.



- What kind of ovule is shown here?
- Label the parts after redrawing the diagram
- Describe the detailed structure of female gametophyte.
- Explain how the female gametophyte is formed.
- Explain what happens when the male gametes are released.
What is the fate of the ovule, and other parts of the flower after fertilization?
- What happens to polar nuclei after fertilization?
- Give the ploidy of cells of chalaza, ovule and polar nuclei

4)

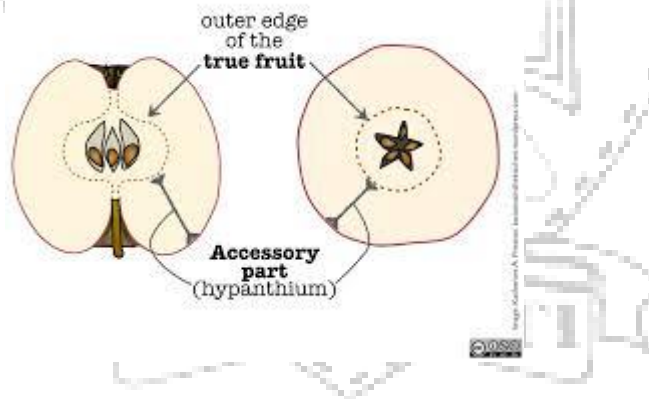


Pollen grain of Angiosperms

- What are germ pores? What is its significance?
- State the function of both the cells of pollen grain.
- What happens to the nucleus of generative cell?
- Name the hard and resistant substance that makes the exine.

5) What is the advantage of a seed to an angiosperm?

7)



- Name the category of fruit the figure above belongs to.
- Give reasons as to why these fruits have been classified as such.
- Give 2 more examples of such fruits.

Chapter 3

HUMAN REPRODUCTION

1 mark each

1. Which parts in the male reproductive system stores sperms?_____
2. What is the site for spermatogenesis?_____
3. The gland which makes the semen alkaline is _____
4. The fluid that protects the embryo in the uterus is _____
5. Why are scrotal sacs present outside the abdomen?
6. Placenta secretes the hormones _____
7. Why Oxytocin is called the birth hormone?
8. Why is the human male referred to as heterogametic?
9. Name the organelles found in the neck of a human sperm.
10. Name the fluid from which fetal cells are obtained for chromosomal analysis.
11. Which part of the body secretes progesterone? State its function.
12. What is corona radiata?
13. Implantation occurs in the _____stage of the embryo.
14. What is the ejaculatory duct in the human male?

2 marks each

- 1) Fertilization is a physicochemical process . Justify.
- 2) Match Column with Column B

A	B
Acrosome	Spermatid
Proliferative phase	Estrogens
Leydig cells	Earthworm
Spermiogenesis	Progesterone
Secretory phase	Spermatozoon
Bisexual animal	Testosterone
Endometrium	Menopause

Uterus	
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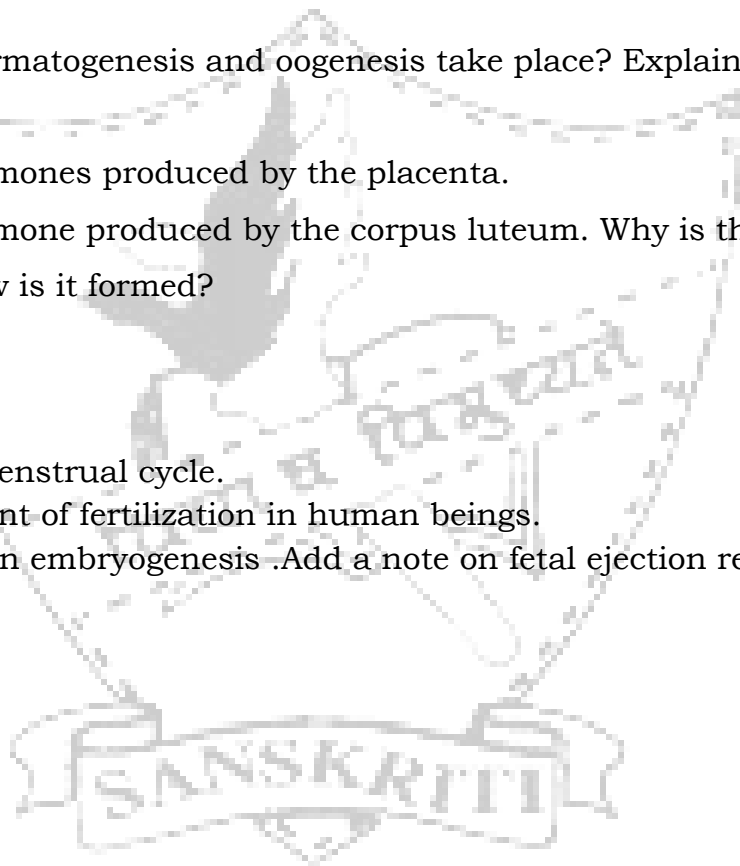
- 4) A spermatogonial cell has 30 chromosomes. How many chromosomes will be found in a primary spermatocyte, spermatid and sperm?
- 6) Name the sperm lysine. Which organelle secretes it? What is its function?
- 7) What causes the corpus luteum to degenerate? Name the structure formed after it degenerates.

3 marks each

1. Where do spermatogenesis and oogenesis take place? Explain the stages of the process.
2. Name the hormones produced by the placenta.
3. Name the hormone produced by the corpus luteum. Why is this structure called so? How is it formed?

5 marks each

- 1) Explain the menstrual cycle.
- 2) Give an account of fertilization in human beings.
- 3) Explain human embryogenesis .Add a note on fetal ejection reflex.



Chapter 4
REPRODUCTIVE HEALTH

1 mark each

1. What is lactational amenorrhea?
2. Name the 'once a week' pill.
3. What is the advantage of 'Saheli' over other pills?
4. What are IUDs?
5. How do implants work?

2marks each

1. What is amniocentesis? Why has it been banned?
2. Expand MMR and IMR.
3. How do pills help in contraception?
4. State any 2 barrier methods of contraception and explain how they work.
5. Explain the principle of emergency contraceptives.

3 marks each

1. Enlist any 3 natural methods of contraception. Discuss their effectivity.
2. What is MTP? Till what time is MTP considered being safe? When was MTP legalized in India? Under what conditions is MTP prescribed?
3. Write a note on the types and dangers of STDs.
4. The diagram below shows a procedure in females. Name and describe the same. What is the parallel procedure in males called?

5 marks

- 1) Discuss the various methods that are employed to treat infertility.

Chapter 5
PRINCIPLES OF INHERITANCE AND VARIATION

1mark each

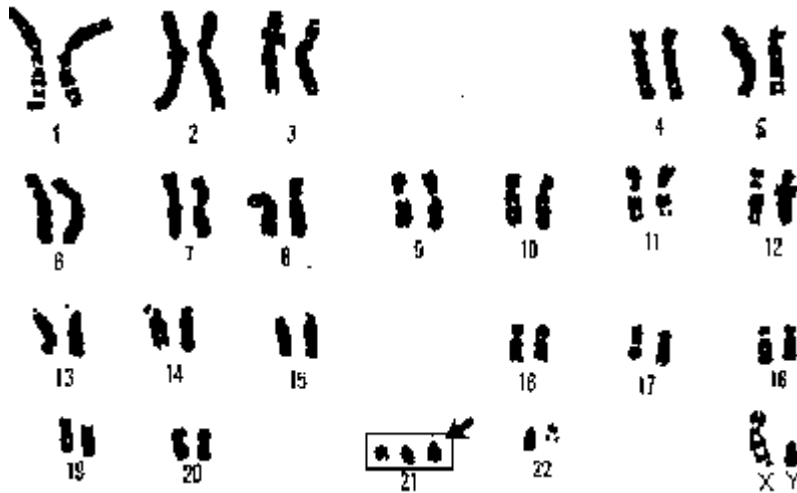
1. Black coat color is dominant over white coat color in guinea pigs. A man who has a black guinea pig as a pet wants to know its genotype. Suggest a method by which the genotype of his pet can be ascertained.
2. Snapdragon plant with red flowers was crossed with another plant with white flowers. What would the offspring be like? Name the phenomenon.

2marks each

1. What is incomplete dominance? Explain with an example.
2. What is blending inheritance? Explain with an example.
3. What are linked genes? What offsprings would you get from a cross between a white eyed female and a red eyed male *Drosophila*?
4. In which of the following organisms is the male responsible for sex determination: *Drosophila*, grasshopper, birds or human beings? Give reasons.

3marks each

1. Explain co dominance.
2. Differentiate between co dominance and incomplete dominance.
3. Give any 2 genetic abnormalities in human beings that are a result of aneuploidy.
4. Define point mutation. Describe the disease that is due to such a mutation in the gene coding for the structure of Hemoglobin.



5)

- What kind of chromosomal abnormality is shown in the diagram?
- Name the syndrome.
- How is it related to the age of the mother?

5 marks each

- Why is hemophilia usually observed in men? Explain the inheritance when a woman also shows the disease.
- Explain in detail a dihybrid cross. What is the significance of standard dihybrid ratio?



Chapter 6

MOLECULAR BASIS OF INHERITANCE

1mark each

1. Why is the ADA enzyme required in our body?
2. Which is not required for polypeptide synthesis: Termination codon, mRNA, peptidyl tranferase, rRNA?
3. Due to a mistake during transcription, ATG forms UAG in mRNA. What change would occur in the polypeptide chain translated by this mRNA?
4. What are introns?
5. Name the enzyme that can break and seal one strand of DNA.
6. Give the full form of YAC and BAC.

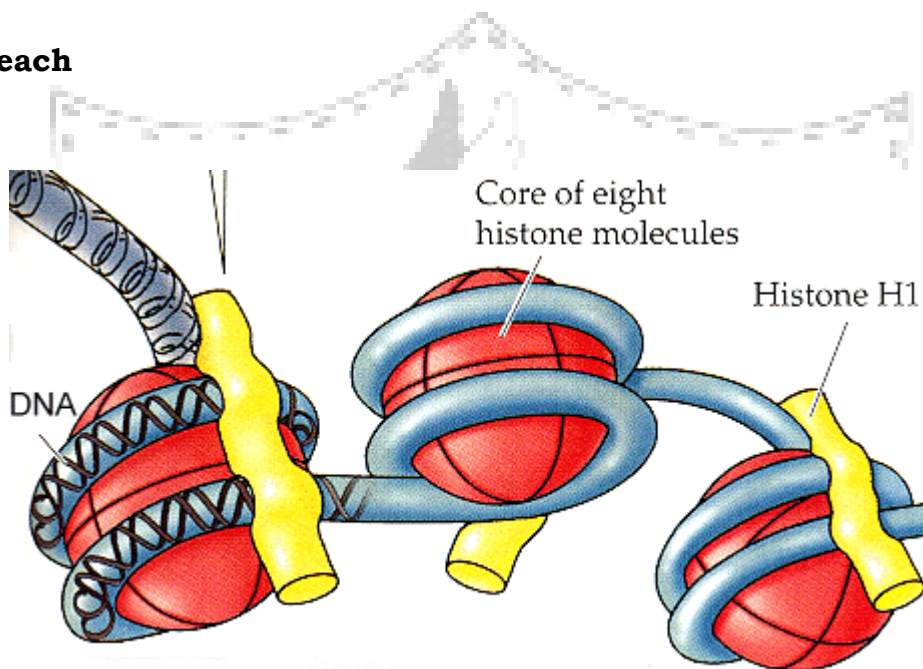
2marks each

1. What is aneuploidy? Give an example from human genetics which shows this problem.
2. In *Drosophila*, why do genes for white eyes and yellow body show less % recombination than white eyes and miniature wings?
3. The base sequence of a strand of DNA is
TACTATTGCATAATT - - - -anti sense strand
ATGATAACGTATTAA- - - - sense strand
 - a) Give the sequence of mRNA formed from this DNA.
 - b) What is the significance of the ATT sequence?
 - c) What would happen if base C (underlined) is deleted?
4. State the central Dogma. Give the features of a DNA helix.
5. Identify the protocol shown below and describe it briefly.

6. Describe the 2 processes unique to eukaryotic transcription.
7. State the role of DNA Polymerase in DNA replication
8. State the role of RNA polymerase in transcription, DNA replication.
9. Why the lac operon is called the inducible system?
10. What is a genetic code? Who proposed the triplet nature of Genetic Code. State any 2 other characteristics of the genetic code.
11. How can an XXY individual be born to a human?
12. What acts as the inducer in lac operon? How does it switch on the operon?
13. What are the components of an operon? State their functions.
14. Name the initiation and the termination codons.
15. Explain what happens in frame shift mutations. Name 1 disease that is caused by this kind of mutation.

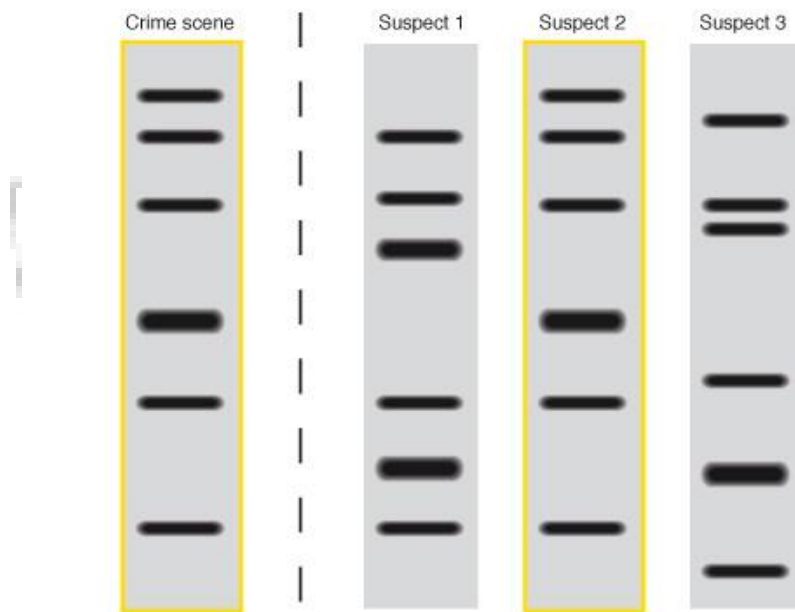
3 marks each

1)



- i. Identify and give the significance of the structure.
- ii. What is the significance of this kind of coiling?
- iii. What would happen to this structure later in the cell cycle in the M- phase?

5.



- What is depicted in the diagram?
- Give the principle of the technique.
- Who is the real criminal? Why?

- What are Okazaki fragments? Name 2 enzymes necessary for DNA replication. Enlist the functions of DNA polymerase.
- List the steps involved in the elongation of polypeptide chain during protein synthesis.
- What was the purpose of Griffith's experiment? Describe his protocol.
- An mRNA strand has a series of codons out of which three are mentioned below. (i) AUG, (ii) UUU, (iii) UAG.
 - What will these codons translated to?

(b) What are the DNA sequences that would have transcribed these RNA codons?

5 marks each

1) What do you understand by an inducible system? Describe an inducible system that is operative in bacteria. What is another name for this kind of regulation?

2) Explain the principle of DNA fingerprinting.

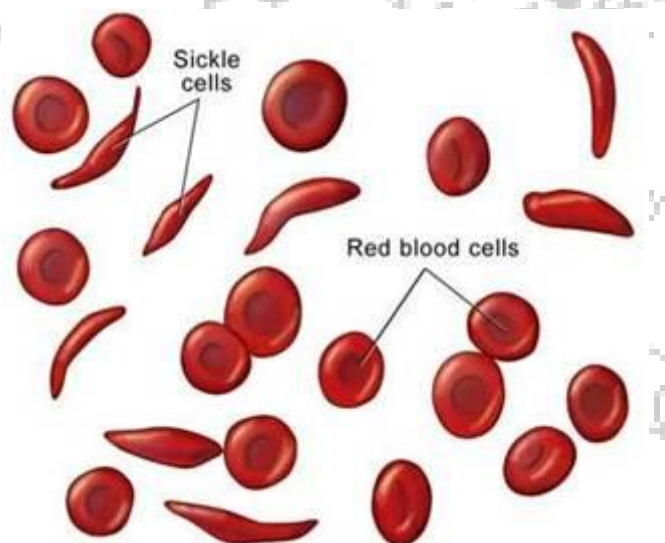
3) A segment of DNA, GCCAGGGGATG was translated into the oligopeptide arg-ser-pro-thr.

a) What was the base sequence in the mRNA transcribed from the DNA segment?

b) What are the codons for these amino acids?

c) If the first adenine in the DNA gets substituted by guanine what will the mRNA be, the anticodons on the tRNA be?

4) The diagram below shows a molecular disease.



a) Identify the disease and give its cause.

b) What are the symptoms of the disease?

c) In spite of this mutation being deleterious in the homozygous state, why has it not been eliminated?

5 Describe any 6 features of human genome.

6 Explain the following experiments along with the discovery that they were responsible for

- a) Hershey and Chase
- b) Griffith
- c) Avery McLeod and McCarty



Chapter 7**EVOLUTION****1 mark each**

1. Sickle cell anemia is a fatal disease. Why have its genes not been eliminated by natural selection as yet?
2. Which were the first mammals to inhabit the earth? Name a mammal that lives wholly in water.
3. Define convergent evolution.
4. Name the animal thought to be ancestors of amphibians. When did the dinosaurs disappear?
5. Name the plant that De Vries worked with, on which he based his mutation theory.

2 marks each

1. Name any 2 organs from the plant kingdom that show analogy.
2. How can reproductive isolation bring about the formation of a new species?
3. Write a short note on the evolution of man.
4. The following figure shows a diagrammatic representation of one of the effects of natural selection. How would you explain the phenomenon?
5. How do homologous and analogous organs support the theory of evolution?
6. A chimp can hold objects with his hands but an elephant with his trunk. Are these structures homologous or analogous? Justify.
7. Explain the concept of Neo-Darwinism

3 marks each

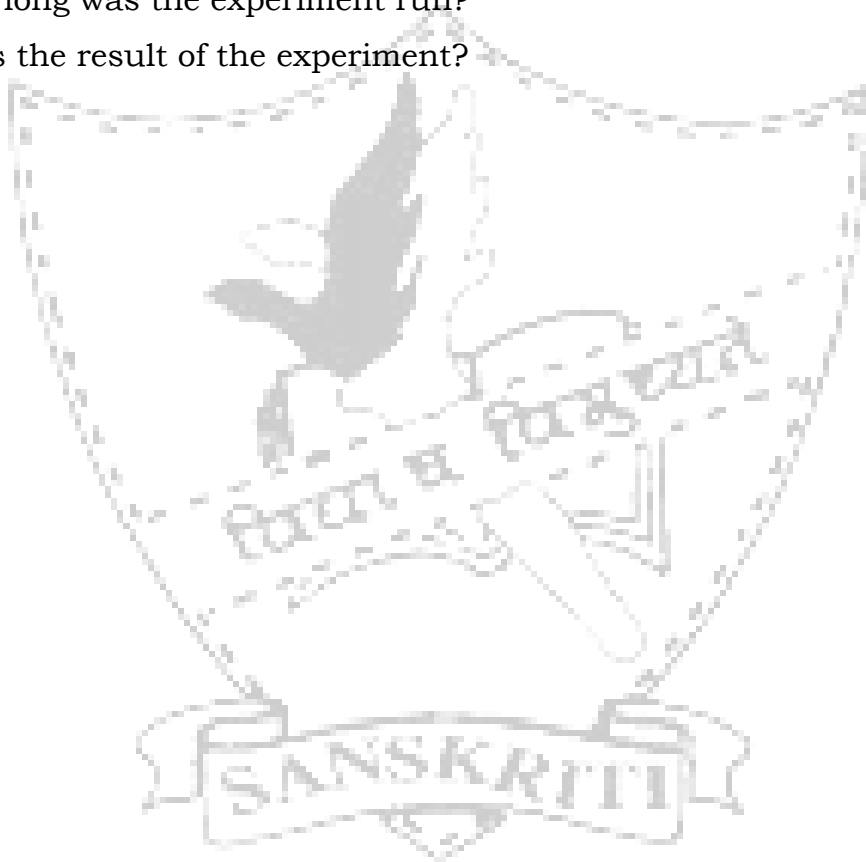
1. Name any 3 organs homologous to the human hand.
2. Mutations cause evolutionary jumps. Justify the statement with the help of an example.
3. Explain the concept of adaptive radiation with the help of an example.
4. Explain Hardy Weinberg Law. State 3 factors that are known to affect the Hardy Weinberg equation
5. How did industrial melanism in *Biston betularia* (Moth) prove the genetic basis of adaptation?

6. Taking examples from anatomy and embryology, prove that evolution does take place.

5 marks each

1) Stanley and Miller performed an experiment by recreating in the lab the probable conditions of the atmosphere of the primitive earth.

- (a) What was the purpose of the experiment?
- (b) In what form was the energy supplied for the chemical reactions to occur?
- (c) What were the energy forms available on primitive earth?
- (d) For how long was the experiment run?
- (e) What was the result of the experiment?



Chapter 8

HUMAN HEALTH AND DISEASES

1 mark each

1. Give the full form and function of MALT.
2. What are withdrawal symptoms?
3. Name the sources of Opioids and Cannabinoids.
4. What is the role of alpha Interferon in Cancer treatment?
5. Define Metastasis.

2 marks each

1. Describe briefly humoral immunity and CMI.
2. List the differences between active and passive immunity.
3. What are the nonspecific defense mechanisms in the body?
4. Define and give 1 example of an autoimmune disorder.
5. Why Hepatitis B vaccine is called a recombinant vaccine?
6. Differentiate between primary and secondary lymphoid organs.

3 marks each

1. What is meant by an Allergic response?
2. Discuss the harmful effects of Alcohol and drug abuse.
3. Describe along with a diagram the structure of an antibody molecule.
4. Discuss the causes and methods of detection of cancer.

5 marks each

1. Describe the life cycle of *Plasmodium vivax*.
2. Discuss the causal organism, symptoms, mode of spread, prevention and control of AIDS and cancer.
3. Value based questions
4. Describe the role of retrovirus in gene therapy.

Chapter 9**STRATEGIES FOR ENHANCING FOOD PRODUCTION****1 mark each**

1. Give the full form and 1 example of SCP.
2. Define Totipotency.
3. Name the causal organism for bird flu. How do we prevent its spread?
4. What is meant by out crossing?
5. Give the full form and location of IRRI.

2 marks each

1. Define and give reason for inbreeding depression.
2. Differentiate between Pisciculture and Aquaculture.
3. What is somatic hybridization? Why is it important?
4. Discuss the importance of MOET in cattle improvement program.
5. Taking an example discuss Biofortification.

3 marks each

1. Taking an example discuss how plant breeding was undertaken to introduced disease resistance in crops.
2. Explain Dairy farm management.
3. Describe the various steps of micropropagation.
4. Discuss the method and importance of mutation breeding.

5 marks each

1. Describe the various steps of a plant breeding program.
2. Discuss in detail Apiculture highlighting the various types of specialized knowledge that is required for this profession

Chapter 10**MICROBES IN HUMAN WELFARE****1 mark each**

1. What is Streptokinase?
2. Define and give 1 example of a methanogen.
3. Name any 2 alcoholic beverages that are produced without distillation.
4. What is Ganga action Plan?
5. Name the metabolic process of Yeast which is responsible for production of alcohol.

2 marks each

1. What is Mycorrhiza? Discuss their importance for crops.
2. Give the source and importance of Cyclosporin.
3. What are Statins? Give their source and mode of action.
4. Discovery of Penicillin was a chance discovery. Discuss.

3 marks each

1. Taking examples discuss the role of microbes in household products.
2. Explain the importance of microbes as bio fertilizer.
3. What is biocontrol? What are its advantages? Discuss the role of microbes as biocontrol agent.

5 marks each

1. Describe along with a flow chart the role of microbes in sewage treatment.
2. Discuss in detail the construction, working and importance of a biogas plant.

Chapter 11**BIOTECHNOLOGY: PRINCIPLES AND PROCESSES****1 mark each**

1. How is plasmid different from a plasmid?
2. What is the role of a vector in Genetic Engineering?
3. What is a recombinant DNA?
4. Why are restriction endonucleases called so?
5. Name one artificial plasmid.
6. What is the function of 'ori' in a vector?
7. What are bioreactors?
8. How are plasmids suitable for use as a vehicle DNA?
9. Why are Restriction Endonuclease synthesized in bacteria?
10. A small amount of DNA is recovered from a crime scene. Name the method that can be used to get multiple copies of this DNA.
11. Define a recombinant protein and give 1 example of such protein

2 marks each

1. How are restriction enzymes named?
2. List the methods of introducing DNA into a host cell.
3. What is recognition sequence? Give an example.
4. What are the features of a vector?
5. Give the role of matrix in electrophoresis. From where is it obtained
6. All vectors are plasmids but not all plasmids are vectors. Discuss.
7. Does recombination occur naturally? When?
8. Define and give the importance of Palindromes in genetic engineering.
9. Why is gene gun more frequently used in plant transformations?
10. What is the role of primers in PCR?
11. Discuss briefly downstream processing.

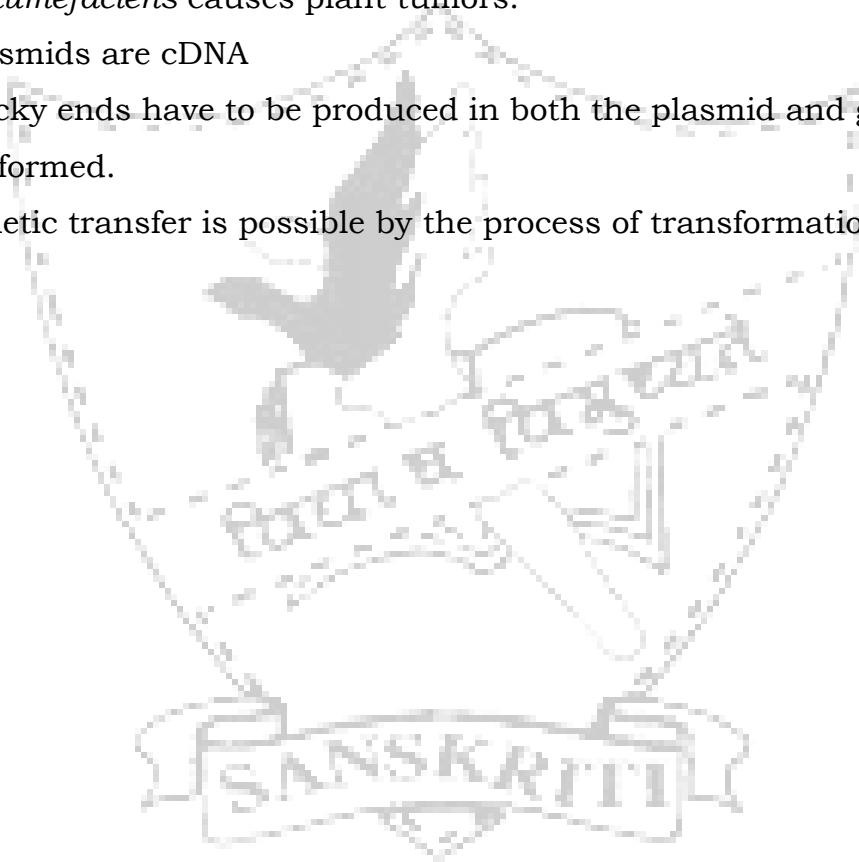
3 marks each

1. What is meant by Endonuclease and Exonuclease? How are they different?
2. Name the molecular scissors and molecular glue of a cell. What is the nature of these biomolecules?

3. Enlist the steps of recombinant DNA technology
4. Name a few lysing enzymes in biotechnology. What is their function?
5. What is the principle and use of PCR?
6. What does a competent cell mean? How can we make a cell competent?

5 marks each

- 1) Describe the technique of gel electrophoresis.
- 2) State true or false with reasons.
 - a. Eukaryotic cells have restriction enzymes.
 - b. *A. tumefaciens* causes plant tumors.
 - c. Plasmids are cDNA
 - d. Sticky ends have to be produced in both the plasmid and gene if rDNA is to be formed.
 - e. Genetic transfer is possible by the process of transformation.



Chapter 12**BIOTECHNOLOGY AND ITS APPLICATIONS****1 mark each**

- 1) How are plasmids suitable for use as a vehicle DNA?
- 2) What does the BT in Bt cotton stand for?
- 3) *Spirulina* is used as a ———
- 4) The crystals of Bt toxin do not kill the bacteria. Give reasons?

2 marks each

- 1) How do cry proteins help in pest control?
- 2) Give 2 advantages that genetic engineering has over traditional plant breeding methods.

3 marks each

- 1) Give some applications of transgenic plants and animals
- 2) What is gene therapy? Illustrate, using the example of the ADA gene.

5 marks each

- 1) *Agrobacterium tumefaciens* is called a natural genetic engineer. Justify. How do scientists use these bacteria in their work?
- 2) Give an example of insertional inactivation. Why is this process preferred? Explain the process.
- 3) Explain the concept of gene therapy and RNAi with examples.

Chapter 13
ORGANISMS AND POPULATIONS

1 mark each

- 1) What is Allen's rule?
- 2) Define and give 1 example of a phytophagous organism.
- 3) Name 1 ectoparasite and 1 endoparasite.
- 4) What is commensalism?

2 marks each

- 1) Why is it that some organisms breed once in their lifetime whereas others breed every season?
- 2) Describe the Gause's exclusion principle.
- 3) What is brood parasitism?
- 4) Which attribute of population indicates the nature of population size? India is said to be an expanding population. Why?

3 marks each

- 1) Differentiate between conformers and regulators.
- 2) Explain mutualism highlighting the role of both partners in influencing the survival and evolution of each other.
- 3) $\frac{dN}{dT} = rN \left\{ \frac{K-N}{K} \right\}$. Describe and give importance of K.
- 4) Discuss the relationship between a lion and a deer highlighting the role of lion in energy transfer and effect on the population of deer.

5 marks each

- 1) Describe the importance of the major abiotic factors.
- 2) $\frac{dN}{Dt} = rN$. Discuss the equation and give its integral form. What type of growth curve is it? Is it possible in nature? Why/Why not?

Chapter 14 ECOSYSTEM

1 mark each

- 1) What is Stratification?
- 2) Define an Ecosystem.
- 3) Give the full form and importance of PAR.
- 4) What is a trophic level?
- 5) Measurement of biomass in terms of dry weight is considered more accurate. Why?

2 marks each

- 1) $GPP - R = NPP$. Discuss.
- 2) Differentiate between Primary and Secondary succession.
- 3) In the ecosystems, energy flow is non cyclic whereas the flow of nutrients is cyclic. Discuss.
- 4) Differentiate between GFC and DFC.
- 5) Write a short note on ecosystem services.

3 marks each

- 1) Discuss the various steps of decomposition.
- 2) Taking an example discuss the concept and importance of ecological pyramids.
- 3) Discuss briefly: Pioneer species, Seral stage and climax community.

5 marks each

- 1) Define and give types of a biogeochemical cycle. Discuss in detail Carbon cycle.
- 2) Describe in detail Hydrarch.

Chapter 15**BIODIVERSITY AND CONSERVATION****1 mark each**

- 1) What is endemism?
- 2) Define co extinction.
- 3) Give the name and importance of lung of the planet.
- 4) What are sacred groves?

2 marks each

- 1) What are the results of loss of biodiversity on a particular area?
- 2) Differentiate between narrowly utilitarian and broadly utilitarian argument for biodiversity conservation.
- 3) Discuss the Rivet popper hypothesis in the context of loss of biodiversity.

3 marks each

- 1) Discuss the 3 types of biodiversities.
- 2) Taking an example discuss the alien species invasion as a cause of loss of biodiversity.
- 3) $\log S = \log C + Z \log A$. Discuss and give the importance of the equation.

5 marks

- 1) What is the importance of conservation? Discuss in detail the 2 approaches.
- 2) Describe some traditional methods of biodiversity conservation. What is the importance of JFM?
- 3) Describe any 4 reasons of loss of biodiversity.

Chapter 16
ENVIRONMENTAL ISSUES

1 mark each

- 1) What is Polybend?
- 2) Define a pollutant.
- 3) Give the source of thermal wastewater.
- 4) How is UV-B radiation harmful?
- 5) What is Dobson unit?

2 marks each

- 1) What are the 3 categories of solid waste? Why should one sort the garbage?
- 2) Differentiate between eutrophication and accelerated eutrophication.
- 3) Discuss the behavior of CFCs in the environment.
- 4) How are agrochemicals harmful? Discuss the alternative method to minimize their use.
- 5) Describe briefly the problem of e - waste.

3 marks each

- 1) Discuss the various sources of air pollution.
- 2) Taking an example discuss the harmful effects of noise pollution.
- 3) Describe the working of an electrostatic precipitator.
- 4) Define B O D. How does it indicate the level of pollution of a water body? Why is it an indirect measure of level of pollution?

5 marks

- 1) What is deforestation? Give its reasons. Discuss reforestation highlighting the importance of people's participation.
- 2) Taking the example of DDT, discuss the phenomenon of biomagnifications.

Grade XII-- Biology Blueprint Board Examination

Unit No.	Weightage	LA(number of questions)	SA II (number of questions)	SA I (number of questions)	VSA (number of questions)
I Reproduction	14	5 (1)	3 (2)	2 (1)	1 (1)
II Genetics and Evolution	18	5 (1)	3 (2)	2 (3)	1 (1)
III Biology in human welfare	14	5 (1)● Value based question	3 (2)	2 (1)	1 (1)
IV Biotechnology and its application	10		3 (1)	2 (2)	1 (3)
V Ecology and environment	14		3 (2)	2 (3)	1 (2)
Total	70	5 (3)=15	3 (9)=27	2(10)=20	1(8)=8

Value based questions are designed to assess values related to day to day life. These are open ended questions for which there is no one correct answers for such questions.

These are about avoiding bad habits, making the right choices, caring for friends and family resisting peer pressure etc.

Students are supposed to understand the value asked in the question and answer accordingly.

Academic Session: 2015-16

Pre Board Examination

Subject: Biology

Time: 3 Hrs.

Max. Marks: 70

General Instructions:

The Question Paper has 5 sections A, B, C, D and E. Section A has 5 questions of 1 mark each, Section B has 5 questions of 2 marks each, Section C has 12 questions of 3 marks each, Section E has 1 value based question of 4 marks and Section D has 3 questions of 5 marks each.

The question paper has 4 printed sides and 26 questions.

Section A

1. What is a gaseous biogeochemical cycle? Give one example.
2. Define Ovipary. Give an example of such an organism.
3. What is the use of Chitinase in biotechnology?
4. Why is secondary immune response more intense than the primary response?
5. Give the use of Baculoviruses.

Section B

6. Explain briefly soil erosion and desertification as improper resource utilization

Practices.

OR

How is slash and burn agriculture harmful for forests? Define Reforestation.

7. Discuss in brief any 2 adaptations of wind pollinated plants.
8. What is the importance of Mycorrhiza? Describe organic farming.
9. Define geitonogamy. Give its 1 similarity to autogamy and xenogamy.
10. Taking an example under each category differentiate between genetic and species diversity.

Section C

11. Explain how human Insulin was produced on an industrial scale.
OR
Describe in detail Gene Therapy.
12. Explain in detail the succession on a bare rock.
13. Name and describe the interactions shown by the following—
 - a) Cuckoo laying eggs in the nest of crow
 - b) Orchid growing on a Mango tree
14. Describe in detail the process of Oogenesis.
15. Explain in detail the post transcriptional modifications in the messenger RNA.
16. Draw a neat and well labeled diagram of an Anatroous ovule and label Microyle, funicle, integument, nucellus and embryo sac.

OR

Draw a neat and well labelled diagram of T.S. Anther and label epidermis middle layers, endothecium tapetum and pollen mother cell.

17. Describe in detail the logistic growth curve. Add a note on how is it a realistic representation of population growth.

18. Explain one reversible and one irreversible contraceptive method for men. Describe GIFT.

19. Describe the principle, procedure and applications of PCR.

20. Mention the compound and its use produced by the following—

a) *Streptococcus*

b) *Lactobacillus*

c) *Saccharomyces*

21. Describe the naming of ECoRI. Taking an example explain the use of marker gene.

22. Explain in detail Bio fortification. Describe the procedure and use of somatic hybridization.

Section D (Value Based)

23. One of your class mates Reema is the daughter of a HIV positive mother and is herself HIV positive. Most of the classmates do not mingle with her and their parents also want the school to send her out. The principal tries and convinces the parents and Reema continues to study.

- a) Do you agree with your classmates in not mingling with Reema? Why/Why not? Give 2 points.
- b) What values are shown by the Principal? Give 2 points.

Section E

24. a) Define a molecular disease. Explain in detail how is it caused due to point mutation.
- b) Give 2 differences between Down's syndrome and Turner's syndrome.

OR

- a) Define Linkage and Recombination. Explain how recombination frequencies were used to

map genes on the chromosome.

- b) Describe the mechanism of sex determination in Insects.

25. Explain the principle, procedure and applications of DNA Fingerprinting.

OR

Describe the structure and functioning of Lac Operon.

26. a) Discuss in detail Convergent Evolution.
b) Describe the Hardy Weinberg equation and its significance.

OR

- a) Taking an example describe how anthropogenic factors affect evolution.
b) Discuss in detail the experiment that provided proof for Chemical Evolution.



QUESTION BANK

1. What are chasmogamous flowers?
2. Define a clone. How would variations occur in such individuals?
3. Does the human blastocyst have zona pellucida? Give reasons.
4. Name the pregnancy hormone. Why is it called so?
5. The cells of a morula are totipotent but that of the ICM of a blastocyst are not. Justify.
6. A flower is brightly coloured and has a sweet smell. Name its pollinating agent. What other features would these flowers have to ensure pollination?
7. What is the target organ and functions of LH in a male and FSH in a female?
8. What are the neuroendocrine mechanisms that bring about parturition.
9. Name the male accessory glands. State their role in keeping the sperms active.
10. What do you understand by floral rewards? Give examples. Who or what are pollen robbers? Why are they called so?
11. Castor is an albuminous, dicot seed. Explain the underlined words. How does seed dormancy help?
12. Describe the organization of a unisexual monoecious organism with an example.
13. Explain how gamete transfer would occur among gametes that are both nonmotile.
14. What does the picture depict? What are the advantages and disadvantages of using this structure?

15. Expand MTP. What are the government rulings regarding MTP in our country? Draw a labeled diagram of a mature male gametophyte.
16. Describe the process of fertilization in a plant. What are the post fertilization events that take place in order to form a mature seed. Give diagrams wherever necessary. Explain the process of fertilization in humans and describe briefly with diagrams, the post fertilization events that occur to form a mature foetus.
17. Why do internodal segments of sugarcane fail to propagate vegetatively even when they are in contact with damp soil?
18. Mention any two probable reasons for rapid rise of population in our country from about 350 million at the time of independence to about 1 billion by the year 2000.
19. The gene I that controls the ABO blood grouping in human beings has three alleles IA, IB and i .(a) How many different genotypes are likely to be present in the human population? (b) Also, how many phenotypes are possibly present?
20. State any one reason to explain why RNA viruses mutate and evolve faster than other viruses.
21. Mention any two measures for prevention and control of alcohol and drug abuse among adolescents.
22. What would be the impact on the environment around a thermal power plant if its electrostatic precipitator stops functioning? Give a reason.
23. Why is thermoregulation more effectively achieved in larger animals than in smaller ones?
24. A plasmid and a DNA sequence in a cell need to be cut for producing recombinant DNA. Name the enzyme which acts as molecular scissors to cut the DNA segments.
25. Even though each pollen grain has two male gametes, why are at least 10 pollen grains and not 5 pollen grains required to fertilise 10 ovules present in a particular carpel?
26. Draw schematically a single polynucleotide strand (with at least three nucleotides). Provide labels and directions. 2
27. Choose and rearrange any four of the following groups of plants in an ascending evolutionary scale.

Cycads; Gnetales; Monocotyledons; Rhynia-like plants; Chlorophyta ancestors; Dicotyledons; and Seed ferns.

28. In which parts of the body of the hosts do the following events in the life cycle of Plasmodium take place? Name both, the body part and the host.
- Fertilization
 - Development of gametocytes
 - Release of sporozoites
 - Asexual reproduction
29. A person injured in a road accident and requiring an urgent immune response was brought to a doctor.
- What did the doctor immediately do?
 - What kind of an immunity was he providing to the patient?
30. Define this kind of immunity.
31. Why does a beekeeper keep beehives in crop fields during the flowering periods?
32. State any two advantages.
33. List any four advantages of genetically modified crop plants over their wild/ domesticated relatives.
34. Which one out of the eurythermal or stenothermal species is likely to survive in increased global temperatures? Give one reason for your answer.
35. Explain why ecological succession will be faster in a forest devastated by fire than on a bare rock? Also compare succession in case of an abandoned land after floods with that on a bare rock?
36. What is the cause of adenosine deaminase deficiency in a person? Why is it that even after infusion of genetically engineered lymphocytes into the patient suffering from deaminase deficiency, the cure is not permanent?
37. A policeman finds a very small piece of body tissue from the site of a crime and takes it to the forensic department.
38. By which technique will they amplify the DNA collected from the tissue sample?
39. Mention in a sequence, the 3 steps involved in each cycle of this technique;
40. What is the role of thermostable DNA polymerase in this technique?

41. In case of Bt cotton, how does the toxic insecticide protein produced by the bacterium kill the insect pest but not the cell of *Bacillus thuringiensis* where the toxic protein is generated?
42. You have been deputed by your school principal to train local villagers in the use of biogas plant. With the help of a labelled sketch explain the various parts of the biogas plant.
43. Illustrate schematically the process of initiation, elongation and termination during transcription of a gene in a bacterium
44. How did Louis Pasteur successfully demolish the popular theory of spontaneous generation? What were his conclusions?
45. If a true breeding homonzygous pea plant with green pod and axial flower as dominant characters is crossed with a recessive homonzygous pea plant with yellow seeds and terminal flowers, then what would be the:
- genotypes of the two parents;
 - phenotype and genotype of the F₁ offspring;
 - phenotypic distribution ratio in F₂ population?
46. With the help of labelled diagrams, depict the stages of a microspore maturing into a pollen grain.
47. (a) Draw a longitudinal sectional view of a typical anatropous ovule to show the site where double-fertilization takes place. Label any four major parts of the ovule.
- (b) How do the male gametes that are present in the pollen grains reach the site mentioned by you in part (a) to cause double fertilization?
48. (a) When and where does spermatogenesis in a human male begin to take place?
- (b) With the help of schematic labelled diagrams trace the development of mature spermatozoa in a human male.
- (c) Describe the structure of a human sperm.
49. (a) Describe the experiment conducted by Alfred Hershey and Martha Chase for identification of genetic material.
- (b) Why is it considered pathbreaking in the field of Molecular Biology?

47)(a) What could be the series of events when an inducer is present in the medium in which E.coli is growing?

(b) Name the Inducer.

48)(a) Write an equation for Verhulst Pearl logistic Growth Where

N = Population density at a time t

r = Intrinsic rate of natural increase and

K = Carrying Capacity

Draw a graph for a population whose population density has reached the carrying capacity.

Why is this logistic growth model considered a more realistic one for most animal populations?

Draw a growth curve where resources are not limiting to growth of a population

