MANAS STUDIES

For Academic and Competitive Excellence

Most Expected Questions

For Class – XII

BIOLOGY

Board Examination 2023-24

With Best Wishes

CHAPTER 1
REPRODUCTION IN ORGANISMS

Q.1 Mention the sites where syngamy occurs in amphibians and reptiles respectively.
Q.2 Offspring derived by asexual reproduction are called clones. Justify giving two reasons.
Q.3 Mention the characteristic features and a function of zoospores in some algae.
Q.4 Name an organism where cell division is itself a mode of reproduction.
Q.5 In Yeast and Amoeba, the parent cell divides to give rise to two new individual cells. How does the cell division differ in these two organisms?
Q.6 Name the type of cell division that takes place in the zygote of an orgnaism exhibiting haplontic life cycle.
Q.7 How does Penicillium reproduce asexually?
Q.8 Name the phase all organisms have to pass through before they can reproduce sexually.
Q.9 Name the group of orgnisms that produces non-motile male gametes. How do they reach the female gamete for fertilization
Q.10 Mention the unique flowering phenomenon exhibited by Strobilantheskunthiana.
Q.11 Cucurbits and Papaya plants bear staminate and pistillate flowers. Mention the categories they are put separately on the basis of type of flowers they bear.
Q.12 Give reason : some organisms like honeybees are called parthengenetic animals.
Q.13 A moss plant produces a large number of antherozoids but relatively only a few egg cells. Why?
Q.14 Why are Papaya and Data Palm plants said to be dioecious whereas cucurbits and coconut palms are monoecious, inspite of all of them bearing unisexual flowers ?
Q.15 The cell division involved in gamete formation is not of the same type in different orgnaims justify
Q.16 A list of three flowering plants is given below. Which ones out of them are
(i) monoecious and
(ii) bearingpistillate flowers. Date Palm, Cucurbits, Pea
Q.17 (a) State the difference between meiocyte and gamete with respect to chromosome number.
(b)Why is whiptail lizard referred to as parthenogenetic?
Q18. (a) Coconut palm is monoecious, while date palm is dioecious. Why are they so called?
(b) Draw a labelled diagram of sectional view of a mature embryo sac of an angiosperm.
Q19. Why do algae and fungi shift to sexual mode of reproduction just before the onset of adverse conditions?

CHAPTER 2
SEXUAL REPRODUCTION IN FLOWERING PLANTS

Q.1 Write briefly the role of pollination in the growth and development in an angiosperm.
Q.2 Describe the structure of a typical/polygonum type embryo sac found in flowering plants. Why is it called monosporic?

Q.3 Why is the process of fertilization in a flowering plant referred to as double fertilization?

Q.4 What is the process of fertilization in flowering plant referred to as double fertilization?

Q.5 The flower of Brinajal is referred to as chasmoganous while that of Bean is cleistogamous. How are they different from each other.

Q.6 Coconut Palm is monoecious while Date Palm is dioecious. Why are they called so?

Q.7 Banana is a parthenocarpic fruit whereas oranges show polyembryony. How are they different from each other with respect to seeds?

Q.8 Name the cell from which the endosperm of Coconut develops. Give the characteristic features of endosperm of coconut.

Q.9 Draw a vertical section of a Maize grain and label.
(i) pericarp (ii) scutellum (iii) coleoptile (iv) radicle

Q.10 Fertilization is essential for production of seeds
(i) Give one example of an angiosperm that produces seed without fertilization. Name the process.
(ii) Explain two ways by which seeds develop without fertilization.

Q.11 Explain any two devices by which autogamy is prevented in flowering plants.

Q.12 Mention the reasons for difference in ploidy of zygote and primary endosperm nucleus in an angiosperm.

Q.13 How does the floral pattern of Mediterranean orchid, Ophrys, guarantee cross pollination ?

Q.14 Draw a longitudnal section of a post pollinated pistil to who entry of pollen tube into mature embryo sac. Label filiform apparatus, chalazal end, hilum, antipodals, male gametes and secondary nucleus.

Q.15 Where does triple fusion take place in a flowering plant. Why is it so called ? Mention its significance.

Q.16 If you squeeze a seed of orange, you might observe many embryos of different sizes. How is it possible ? Explain.

Q.17 (a) Mention any four strategies adopted by flowering plants to prevent self pollination.
(b) Why is geitonogamy also referred to geneticalautogamy ?

Q.18 Explain giving two reasons why pollen grains can be best measured as fossils.

Q.19 How many haploid cells are present in a mature female gametophyte of a flowering plant. Name them.

Q.20 Differentiate between albuminous and non-albuminous seeds, giving one example each.

Q.21 Draw a diagram of a male gametophyte of an angiosperm. Label any four parts . Why is sporollenin considered the most resistant organic material ?

Q.22 Differentiate between geitonogamy and xenogamy in plants. Which one between the two will lead to inbreeding depression and why ?

Q.23 Where is sporollenin present inplants ?state its significance with reference to its chemical nature.
Q.24 State one advantage and one disadvantage of cleistogamy.
Q.25 Explain the function each of (a) Coleorhiza (b) Germ pores .
Q.26 How does the study of different parts of a flower help in identifying wind as its pollinating agent ?
Q.27 Write the cellular contents carried by the pollen tube. How does the pollen tube gain entry into the embryo sac ?
Q.28 Name the product of fertilization that forms the kernel of coconut. How does the Kernel differ from coconut water ?
Q.29 (a) Mention the similarity between autogamy and geitonogamy.
(b) How does geitonogamy differ from xenogamy?
Q.30 Differentiate perisperm and endosperm giving one example of each.
Q.31 How does pollen mother cell develop into a mature pollen grain? Illustrate the stages with labelled diagrams.
Q.32 (a) Draw a labelled diagram of a mature embryo sac.
(b) Why does a pollen grain possess two male gametes?
Q.33 (a) Trace the development of embryo after synagmy in a dicot plant.
Q.34 (b) Endosperm development precedes embryo development. Explain.
(c) Draw a diagram of a mature dicot embryo and label cotyledons, plumule, radicle, hypocotyl in it.
Q.34 Describe in sequence the events that lead to the development of a 3-celled pollen grain from microspore mother cell in angiosperms.
Q.35 (a) Draw a labelledlongisectional view of an alubumniousseed ?
(b) How are seeds advantageous to flowering plants ?
Q.36 Explain double fertilization and trace the post fertilization events in sequential order leading to seed formation in a typical dicotyledonous plant.
Q.37 Give reasons why
(i) Most zygotes in angiosperms divide only after certain amount of endosperm is formed.
(ii) Groundnut seeds are exalbuminous and Caster seeds are albuminous.
(iii) Micropyle remains as a small pore in the seed coat of a seed.
(iv) Integuments of an ovule harden and the water content is highly reduced as the seed matures.
(v) Apple and Cashew are not called true fruits.
Q.38 (a) Draw a labelled diagram of L.S. on an embryo of grass (any six labels).
(b) Give reasons for each of the following
Q.39 (a) Draw a diagram of an enlarged view of T.S. one microsporangium of an angiosperm and label the following parts :
(i) Tapetum (ii) Middle layer
(iii) Endothecium (iv) Microspore mother cells
Mention the characteristic features and functions of tapetum.

(b) Explain the following giving reasons :
(i) Pollen grains are well preserved as fossils
(ii) Pollen tablets are in use by people these days.

Q.40 (a) Why is the process of fertilization in angiosperms termed as double fertilization. Explain.
(b) Draw a diagram of an angiospermic embryo sac where fertilization is just completed. Label the following (i) Micropylar and of embryo sac (ii) Part that develops into an embryo (iii) Part that develops into an endosperm (iv) The degenerating cells at chalazal end.
(c) Draw a labelled diagram of globular embryonic stage of an angiosperm.

Q.41 (a) Explain the characteristic features of wind pollinated flowers. How are insect pollinated followers different from them ?
(b) Explain the mutually rewarding relationship between Yucca plant and species of moth.

Q.41 How does the megaspore mother cell develop into 7-celled, 8 –nucleate embryo sac in an angiosperm ?
Draw labelled diagram of a mature embryo sac.

Q.42 (a) Why is fertilization in an angiosperm referred to as double fertilization? Mention the policy of the cells involved.
(b) Draw a neat labelled sketch of L.S. of an endospermous monocot seed.

Q.43 (a) How does microspore mother cell develop into mature pollen grain in angiosperms?
(b) Describe the structure of a mature pollen grain and draw a labelled diagram of its two celled stage.

Q.44 Why are beehives kept in a crop field during flowering period? Name any two crop fields where this is practised.

Q.45 Explain any three advantages that seeds offer to angiosperms.

Q.46 (a) Why does endosperm development precede embryo development in angiosperm seeds?
State the role of endosperm in mature albuminous seeds.
(b) Describe with the help of three labelled diagrams the different embryonic stages that include mature embryo of dicot plants

CHAPTER-3
HUMAN REPRODUCTION

Q.1 Why does failure of testes to descend into scrotum produce sterility?

Q.2 Sperms have a tail whereas eggs do not. Why so?

Q.3 Mention the function of trophoblast in human embryo.

Q.4 Name of embryonic stage that gets implanted in the uterine wall of a human female.

Q.5 What stimulates pituitary to release the hormone responsible for parturition? Name the hormone.

Q.6 List the changes the primary oocyte undergoes in the tertiary follicular stage in the human ovary.

Q.7 Write the location and function of Sertoli cells in humans.

Q.8 When do the oogenesis and spermatogenesis initiate in human females and males respectively?
Q.9 Mention the difference between spermiogenesis and spermiation.
Q.10 Where is acrosome present in humans? Write its functions.
Q.11 Explain the function of umbilical cord.
Q.12 How is the entry of only one sperm and not many ensured into an ovum during fertilization in humans?
Q.13 Identify the given figure and the part labeled 'A'
Q.14 Mention the location and function of Leydig cells in humans.
Q.15 Mention the function of mitochondria in sperm.
Q.16 What is monospermy? How is polyspermy prevented in humans.
Q.17 What is gynaecomastia ? What is its cause during neonatal period and during puberty?
Q.18 What is pregnancy hormone? Why is it so called? Name two sources of the hormone in a human female.
Q.19 Draw a labeled diagram of ovum and label its four parts.
Q.20 Why is the human placenta referred to as haemochorial type? Explain.
Q.21 Draw a labeled diagram of a sectional view of human ovary showing various stages of follicles growing in it.
Q.22 Where are fimbriae present in a human female reproductive system? Give their function.
Q.23 Name the muscular and glandular layers of human uterus. Which one of these layers undergoes cyclic changes during menstrual cycle? Name the hormone essential for maintenance of this layer.
Q.24 Where are Leydig cells present? What is their role in reproduction?
Q.25 Name the source of gonadotropins in human females. Explain the changes brought about in the ovary by these hormones during menstrual cycle.
Q.26 Placenta acts as an endorine tissue. Justify.
Q.27 Mention the fate of corpus luteum and its effects on the uterus in the absence of fertilization of the ovum in the human female.
Q.28 Spermatogenesis in human males is a hormone regulated process. Justify.
Q.29 Draw a labeled diagram of the reproductive system in human female.
Q.30 Name the hormones produced only during pregnancy in human female. Mention their source organ.
Q.31 (a) Where do the signals for parturition originate in humans?
(b) Why is it important to feed the new born babies on colostrum
Q.32 (a) Oviducal fimbriae (b) Oxytocin
(c) Middle piece in human sperm (d) Seminal vesicle
(e) Acrosome of human sperm
Q.33 Give a schematic representation of of oogenesis in humans. Mention the number of chromosomes at each stage. Correlate the life phases of the individual with the stages of the process

Q.34 (a) Give a schematic representation of spermatogenesis in humans.
(b) At which stage of life does gametogenesis begin in human male and femalerespectively?
(c) Name the organs where gametogenesis gets completed in human male and female respectively.

Q.35 (a)Draw a labeled diagram of a sectional view of human seminiferous tubule.
(b) Differentiate between gametogenesis in human males and females on the basis of (i) Time of initiation of the process. Products formed at the end of the process.

Q.36 Draw a diagrammatic sectional view of human ovary showing different stages of oogenesis alongwith corpus luteum.

Q.37 Where is morula formed in humans? Explain the process of its development from zygote.

Q.38 (a) Draw a schematic diagram of human sperm and label the cellular componentsgive the functions of any three parts.
(b) Where are the sperm heads found embedded after spermatogenesis?

Q.39 (a) When and how does placenta develop in human female?
(b) How is placenta connected to the embryo?
(c) Placenta acts as an endocrine gland. Explain.

Q.40 When and where are primary oocytes formed in human female? Trace the development of these oocytes till ovulation (in menstrual cycle). How do gonadotropins influence this developmental process?

Q.41 (a) Explain the events taking place at the time of fertilization of an ovum in a human female.
(b) Trace the development of zygote upto its implantation in the uterus.
(c) Name and draw a labeled sectional view of the embryonic stage that gets implanted.

Q.42 (a) Give a schematic representation showing the events of spermatogenesis in human male.
(b) Describe the structure of a human sperm.

Q.43 (a) Draw a diagrammatic labeled sectional view of a seminiferous tubule of a human
(b) Describe in sequence the process of spermatogenesis in humans.

Q.44 Describe the post-zygotic events leading to implantation and placenta formation in humans. Mention any two functions of placenta.

Q.45 Explain the process of fertilization in human female. Trace the post-fertilization events in sequential order upto implantation of the embryo.
(a) Draw a labeled diagram of the human female reproductive system.
(b) Enumerate the events in the ovary of a human female during (i) Follicular phase (ii) Lufeal phase of menstrual cycle.

Q.46 (a) Write the specific location and functions of the following cells in human males.
(i) Leydig cells (ii)Sertoli cells (iii) Primary spermatocyle
(b) Explain the role of two accessory glands in human male reproductive system.

Q.47 (a) When and where does spermatogenesis occur in a human male?

(b) Draw a diagram of a mature human male gamete. Label the following parts : acrosome, nucleus, middle piece, tail.
(c) Mention the function of acrosome and middle piece.

Q.50 (a) How is 'oogenesis' markedly different from 'spermatogenesis' with respect to the growth till puberty in the humans?
(b) Draw a sectional view of human ovary and label the different follicular stages, ovum and Corpus luteum.

Q52. Name and explain the role of the inner and middle walls of the human uterus.

Q53. Explain the ovarian and uterine events that occur during a menstrual cycle in a human female under the influence of pituitary and ovarian hormones respectively.

Q.54 Name and explain the role of inner and middle wall of human uterus?

Q.55 Women are often blamed for producing female children. Consequently, they are illtreated and ostracized. How will you address the issue scientifically?

Q.56 A) How is oogenesis markedly different from spermatogenesis with respect to growth till puberty?
B) Draw sectional view of human ovary. Label follicular stages, ovum, and corpus luteum.

Q.57 Draw labeled diagram of sectional view of seminiferous tubule (label any six parts)

Q.58 Explain ovarian and uterine events during menstrual cycle under the influence of pituitary and ovarian hormones.

Q.59 a) differentiate between:
i)vas deferens and vas efferentia
ii) Spermatogenesis and spermiogenesis
b) Draw labeled diagram of male reproductive system.

CHAPTER-4
REPRODUCTIVE HEALTH

Q1. Mention any two events that are inhibited by the intake of oral contraceptive pills to prevent pregnancy in humans.

Q2. Why is tubectomy considered a contraceptive method?

Q3. A mother of one year old daughter wanted to space her second child. Her doctor suggested Cu-T. Explain its contraceptive actions.

Q4. (a) Expand IUD (b) Why is hormone releasing IUD considered a good contraceptive to space children?

Q5. Explain any two methods of Assisted Reproductive Technology (ART) that has helped childless couples to bear children.

Q6. How does Cu T act as an effective contraceptive for human females?

Q7. Name the hormonal composition of oral contraception used by human females. Explain how does it act as contraceptive?

Q8. Why do some women use " Saheli" pills?

Q9. How are assisted reproductive technologies helpful to humans? How are ZIFT and GIFT different from intrauterine transfers ? Explain.
Q10. Name any two copper releasing intra-uterine devices (IUDs). List two reasons that make them effective contraceptives.
Q11. How do copper and hormone releasing IUDs act as contraceptives ?Exlain.
Q12. Explain the zygote intrafallopian transfer technique (ZIFT). How is intrauterine transfer technique (IUT) different from it?
Q13. What is amniocentesis? Why has the government imposed a statutory ban inspite of its importance in the medical field?
Q14. Why is 'Saheli' a well accepted contraceptive pill? (C.B.S.E. 2010)
Q15. Why is CuT considered a good contraceptive device to space children?
Q16. Name an oral pill used as a contraceptive by human females. Explain how does it prevent pregnancy?
Q17. At the time of independence, the population of India was 350 million which exploded to over 1 billion by May 2000. List any two reasons for this rise in population and any two steps taken by the government to check this population explosion.
Q18. Explain how do the following act as contraciptives (a)CuT(b)'Saheli'
Q19. Women are often blamed for producing female children. Consequently, they are ill-treated and ostracised. How will you address this issue scientifically if you were to conduct an awareness programme to highlight the values involved?

CHAPTER-5
PRINCIPLES OF INHERITANCE AND VARIATION

Q1. Who developed Punnet Square?
Q2. Why do certain genes tend to be inherited together in a cell at the time of cell division.
Q3. What is sex chromosome complement of male bird.
Q4. Name one autosomal dominant and one autosomal recessive Mendeliandisorder in humans.
Q5. Write the genotype of (i) An individual who is carrier of sickle-cell anaemia gene but apparently unaffected (ii) An individual affected with the disease.
Q6. A human being suffering from Down's syndrome show trisomy of 21st chromosome. Mention the cause of this chromosomal abnormality.
Q7. Name the event during cell division cycle that results in gain or loss of chromosome. (C.B.S.E. 2011)
Q8. Name the phenomenon and cell responsible for the development of new individual without fertilization as seen in honey bees. (C.B.S.E. 2011)
Q9. (a) A garden pea plant
(A) Produced inflated yellow pods and another plant.
(B) of the same species produced constricted green pods.
(b) A garden pea plant produced axial white flowers. Another of the same species produced terminal violet flowers.

(c) A garden pea plant produced round green seeds. Another of the same species produced wrinkled yellow seeds.

Q10. Name the respective pattern of inheritance where F_1phenotype
(a) Does not resemble either of the two parents and is in between the two
(b) Resembles only one of the two parents.

Q11. In a dihybrid cross, when would the proportion of the parental gene combinations be much higher than non-parental type as experimentally shown by Morgan and his group

Q12. Why is that the father never passes on the gene for haemophilia to his sons? Explain.

Q13. Write the possible genotypes Mendel got when be crossed F_1 tall pea plants with dwarf pea plants.

Q14. Why in a test cross, did Mendel cross a tall pea plant with a dwarf pea plant only.

Q15. Explain what do you know of criss-cross inheritance.

Q16. What is autopolyploidy? How does colchicine induce polyploidy? Name an autopolyploid that has succeeded as a variety.

Q17. At the time of independence, the population of India was 350 million which exploded to over 1 billion by May 2000. List any two reasons for this rise in population and any two steps taken by the government to check this population explosion.

Q18. Explain how do the following act as contraciptives
(a) CuT(b) 'Saheli'

Q19. The male Fruitfly and female Fowl are heterogametic while the female Fruitfly and the male Fowl are homogametic. Why are they called so?

Q20. Explain the pattern of inheritance of haemophilia in humans. Why is the possibility of a human female becoming haemophilic extremely rare? Explain.

Q21. A plant of Antirrhinum majus with red flowers was crossed with another plant of the same species with white flowers. The plants of F_1 generation bore pink flowers. Explain the pattern of inheritance with the help of a cross.

Q22. A woman with blood group O married a man with AB group. Show the possible blood groups of the progeny. List the alleles involved in this inheritance. (C.B.S.E. 2008)

Q23. A tall Pea plant with yellow seeds (heterozygous for both) is crossed with a dwarf Pea plant with green seeds. Using a Punnet square work out the cross to show the phenotypes and the genotypes of F_1 generation.

Q24. How does a test cross help in identifying the genotype of the organism? Explain.

Q25. During his studies on genes in Drosophila that were sex-linked T.H. Morgan found F_2population phenotypic ratios deviated from expected 9:3:3:1. Explain the conclusion he arrived at.

Q26. When a tall Pea plant was selfed, it produced one-fourth of its progeny as dwarf. Explain with the help of a cross. Why are F_2 phenotypic and genotypic ratios same in a cross between red flowered Snapdragon and white flowered Snapdragon plants? Explain with the help of a cross.

Q27. (i) Why are Grass hopper and Drosophila said to show male heterogamety? Explain.

(iii) Explain female heterogematy with the help of an example.

Q28. Explain the sex determination mechanism in humans. How is it different in birds.

Q29. Explain the mechanism of sex determination in insects like Drosophila and Grass hopper.

Q30. Work out a cross between true breeding red and white flowered Dogflower (Snapdragon) plants up to F_2progeny. Explain the results of $F_1$and F_2 generations.

Q31. How are dominance, codominance and incomplete dominance patterns of inheritance different from one another?

Q32. (a) Sickle cell anaemia in humans is a result of point mutation. Explain.
(b) Write the genotypes of both the parents who have produced a sickle celled anemic offspring.

Q33. A Pea plant with purple flowers was crossed with plant having white flowers. The progeny produced only purple flowers. On selfing, these plants produced 482 plants with purple flowers and 162 plants with white flowers. What genetic mechanisms accounts for these results ? Explain.

Q34. (a) Explain the phenomenon of multiple allelism and codominance taking ABO blood group as an example.
(b) What is the phenotype of
(i) I^Ai (ii)ii?

Q35. Explain how does trisomy of 21^{st} chromosome occur in humans. LIst any four characteristic features in an individual suffering from it.

Q36. (a) Explain sex determination in humans.
(b) How do human males with XXY abnormality suffer?

Q37. Snapdragon shows incomplete dominance for flower colour. Work out a cross and explain the phenomenon. How is this inheritance different from Mendelian pattern of inheritance ? Explain.

Q38. Name the phenomenon that leads to situation like 'XO' abnormality in humans. How do humans with 'XO' abnormality suffer ? Explain.

Q39. A true breeding Pea plant homozygous for axial violet flowers is crossed with another Pea plant with terminal white flowers (aavv).
(a) What would be the phenotype and genotype of F_1 and F_2 generation?
(b) Give the phenotypic ratio of F_2 generation.
(c) List the Mendal'sgeneralisations which can be derived from the above cross.

Q40. A homozygous tall Pea plant with green seeds is crossed with a drarf Pea plant with yellow seeds. (i) What would be the phenotype and genotype of F1? (ii) Work out the phenotypic ratio of F_2 generation with the help of Punnet square.

Q41. AAnapdragon plant homozygous for red flowers when crossed with a white flowered plant of the same species produced pink flowers in F_1 generation. (a) What is this phenotypic expression called? (b) Work out the cross to show the F_2 generation when F1 was self pollinated. Give the phenotypic and genotypic ratios of F_2 generation. (c) How do you compare the F_2 phenotypic and genotypic ratios with those of Mendelian monohybrid F_2ratios.

Q42. Inheritance pattern of flower colour in Garden Pea and Snapdragon differs. Why is this difference observed? Explain showing the crosses uptoF_2 generation. (C.B.S.E. 2009)

Q43. You are given a red flower bearing pea plant and a red flower bearing Snapdragon plant. How would you find the genotypes of these two plants with respect to the colour of the flower. Explain with the help of crosses. Comment upon the pattern of inheritance seen in these two plants. Hint. Red Pea plant can be homozygous or heterozygous. Red Snapdragon is homozygous).

Q44. A particular garden pea plant produces only violet
(a) Is it homozygous dominant for the trait or heterozygous?
(b) How would you ensure its genotype? Explain with the help of crosses.

Q45. (a) How does chromosomal disorder differ from a mendelian disorder?
(b) Name any two chromosomal aberration associated disorders.
(c) List the characteristics of the disorders mentioned above that help in their diagnosis.

Q46. Explain the causes, inheritance pattern and symptoms of any two mendelian genetic disorders.

Q47. Write the symptoms of haemophilia and sickle-cell anaemia in humans. Explain how the inheritance patterns of the two diseases differ from each other.

Q48. (a) State the law of independent assortment.
(b) Using Punnet square, demonstrate the law of independent assortment in a dihybrid cross involving two heterozygous parents.

Q49. ABO blood grouping in human population exhibits four possible phenotypes from six different genotypes. Explain different mechanisms of inheritance involved in exhibiting the possibility of four phenotypes and six genotypes.

Q50. (a) Why is haemophilia generally observed in human males? Explain the conditions under which a human female can be haemophilic.
(b) A pregnant human female was advised to undergo MTP. It was diagnosed by her doctor that the foetus she was carrying has developed from a zygote formed by an XX-egg fertilized by a Y- carrying sperm. Why was she advised to undergo MTP?

Q51. (a) A true-breeching homozygous pea plant with green pods and axial flowers as dominant characters, is crossed with recessive homozygous pea plant having yellow pods and terminal flowers. Work out the corssuptoF$_2$ generation giving the phenotypic ratios of F_1 and F_2 generations respectively. (b) State the Mendelian principle which can be derived from such a cross and not from monohybrid cross.

Q52. What is the inheritance pattern observed in the size of starch grains and seed shape in PisumSativum. Work out the monohybrid cross showing the above traits. How does this pattern of inheritance deviate from that of Mendelian law of dominance?

Q53. (a) List the three different allelic forms of gene 'I' in humans. Explain the different phenotypic expressions, controlled by these three forms. (b) A woman with blood group 'A' marries a man with blood group 'O'. Discuss the possibilities of the inheritance of the blood groups in the following starting with "Yes" or "No" for each.

(i) They produce children with blood group 'A' only.
(ii) They produce children some with 'O' boood group and some with 'A' blood group.

Q54. (a) A garden pea plant bearing terminal, violet flowers when crossed with another pea plant bearing axial violet flowers, produced axial violet flowers and axial white flowers in the ratio of 3:1. Work out the cross showing the genotypes of the parent pea plants and their progeny.
(b) Name and state the law that can be derived from this cross and not from a dihybrid cross.

Q55. (a) Four children with four different blood groups are born to parents where the mother has blood group 'A' and the father has blood group 'B'. Work out the cross to show the genotypes of the parents and all four children.
(b) Explain the contribution of Alfred Sturtevant in chromosome mapping.

Q56. A colour-blind child is born to a normal couple. Work out a cross to show how it is possible. Mention the sex of this child.

OR

Mendel published his work on inheritance of characters in 1865, but it remained unrecognised till 1900. Give three reasons for the delay in accepting his work.

Q57. How does the gene 'I' control ABO blood groups in humans? Write the effect the gene has on the structure of red blood cells.

OR

Write the types of sex-determination mechanisms the following crosses show. Give an example of each type.
(i) Female XX with Male XO
(ii) Female ZW with Male ZZ

Q58. A cross was carried out between two pea plants showing the contrasting traits of height of the plants. The result of the cross showed 50% parental characters.
(i) Work out the cross with the help of a Punnett square.
(ii) Name the type of the cross carried out.

Q59. A cross between a normal couple resulted in a son who was haemophilic and a normal daughter. In course of time, when the daughter was married to a normal man, to their surprise, the grandson was also haemophilic.
(a) Represent this cross in the form of a pedigree chart. Give the genotypes of the daughter and her husband.
(b) Write the conclusion you draw of the inheritance pattern of this disease.

Q60. Women are often blamed for producing female children. Consequently, they are illtreated and ostracised. How will you address this issue scientifically if you were to conduct an awareness programme to highlight the values involved? (C.B.S.E.2014)

Q61. A colour-blind child is born to a normal couple. Work out a cross to show how it is possible. Mention the sex of this child.

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(ii) Female ZW with Male ZZ (C.B.S.E.2014)

CHAPTER-6
MOLECULAR BASIS OF INHERITANCE

Q1. Mention two functions of codon AUG.

Q2. Name the enzyme involved in the continuous replication of DNA strand. Mention the polarity of template strand.

Q3. Mention the role of the codons AUG and UGA during protein synthesis?

Q4. Mention the contribution of genetic maps in human genome project

Q5. The length of a DNA molecule in a typical mammalian cell is calculated to be approximately 2.2 meters. How is the packaging of this long molecule done to accommodate it within the nucleus of the cell.

Q6. Explain the process of charging of tRNA. Why is it essential in translation?

Q7. (a) Draw the structure of the initiator tRNA adaptor molecule.
(b) Why is tRNA called an adaptor molecule?

Q8. Given below is part of the template strand of a structural gene: TAC CAT TAG GAT
(a) Write its transcribed mRNA strand with its polarity.
(b) Explain the mechanism involved in initiation of transcription of this strand.

Q9. How is the translation of mRNA terminated? Explain.

Q10. Draw a labeled schematic sketch of replication fork of DNA. Explain the role of the enzymes involved in DNA replication.

Q11. Explain the dual function of AUG codon. give the sequence of bases it is transcribed from and its anticodon.

Q12. What are satellite DNAs in a genome? Explain their role in DNA finger printing.

Q13. (a) Draw a schematic representation of a transcription unit and show the following in it.
(i) Direction in which the transcription occurs (ii) Polarity of the two strands involved
(iii) Template strand (iv) Terminator
(b) Mention the function of promoter in transcription.

Q14. (a) In human genome which one of the chromosomes has the most genes and which one has the fewest?
(b) Scientists have identified about 1.4 million single nucleotide polymorphs in human genome. How is the information of their existence going to help the scientists

Q15. Name the category of codons UGA belongs to. Mention another codon of the same category. Explain their role in protein synthesis.

Q16. Differentiate between a template strand and a coding strand of DNA.
Describe the initiation process of transcription in bacteria.

Q17. Describe the elongation process of transcription in bacteria.
Q18. Describe the termination process of transcription in bacteria.
Q19. Mention the role of ribosomes in peptide bond formation. How does ATP facilitate it?
Q20. In a series of experiments with Streptococcus and mice, F. Griffith concluded that Rstrain bacteria had been transformed. Explain.
Q21. Draw a schematic representation of a nucleotide. Label the following : (i) The components of a nucleotide (ii) 5' end (iii) N-glycosidic linkage (iv) phosphodiester linkage
Q22. How do histones acquire positive change?
Q23. Base sequence in one of the strands of DNA is TAG CAT GAT.
(i) Give the base sequences of its complementary strand.
(ii) How are these base pairs held together in a DNA molecule?
(iii) Explain the base complementarity rule. Name the scientist who framed this rule.
Q24. Write the full form of VNTR. How is VNTR different from probe?
Q25. (i) Name the enzyme that catalyses the transcription of hn RNA
(ii) Why does hn RNA need to undergo changes? List the changes hn RNA undergoes and where in the cell such changes take place.
Q26. Unambiguous, universal and degenerate are some of the terms used for genetic code. Explain the salient features of each one of them.
Q27. Answer the following questions based on Meselson and Stahl's experiment.
(a) Write the name of the chemical substance used a source of nitrogen in the experiment by them.
(b) Why did the scientists synthesise the light and the heavy DNA molecules in the organism used in the experiment.
(c) How did the scientists make it possible to distinguish the heavy DNA molecule from the light DNA moledule? Explain.
(d) Write the conclusion the scientists arrived at after completing the experiment.
Q28. Draw a neat labeled sketch of replicating fork of DNA.
Q29. Draw a schematic diagram of a part of double stranded dinucleotide DNA chain having all the four nitrogenous bases and showing the correct polarity.
Q30. Draw a labeled schematic diagram of a transcription unit.
Q31. Draw the structure of a tRNA charged with methionine.
Q32. Draw a schematic diagram of lac operon in its 'switched off' position. Label
(i)The Structural genes (ii) Repressor bound to its correct position
(iii) Promoter gene (iv) Regulator gene
Q33. It is established that RNA is the first genetic material. Explain giving three reasons.
Q34. (a) Name the enzyme responsible for transcription of tRNA and the amino acid to which initiator tRNA gets linked with.
(b) Explain the role of initiator tRNA in initiation of protein synthesis.
Q35. (a) Construct a complete transcription unit with promoter and terminator on the basis of hypothetical template strand given below :

(b) Write the RNA strand transcribed from the above transcription unit along with its polarity.

Q36. How are structural genes activated / inactivated in lac operon in E. coli. Explain.

Q37. List the salient features of double helix structure of DNA.

Q38. State the functions of the following in a prokaryote:
(i)tRNA (ii) rRNA

Q39. Why is DNA considered a better hereditary material than RNA?

Q40. How is hnRNA processed to from mRNA?

Q41. How are the DNA fragments separated and isolated for DNA finger printing ?Explain.

Q42. State the conditions when genetic code is said to be Degenerate
(i) Unambiguous and specific (ii) Universal

Q43. 44. Explain the process of translation / transcription in a bacterium.

Q44. Forensic department was given three blood samples. Write the steps of the procedure carried to get the DNA fingerprinting done for the above samples.

Q45. (a) Draw a neat labeled diagram of a nucleosome.
(b) Mention what enables histones to acquire a positive charge.

LONG ANSWER TYPE QUESTION:

Q1. What is semiconservative DNA replication? How was it experimentally proved and by whom?

Q2. (a) Why is DNA more stable genetic material than RNA? Explain.
(b) Unambiguous degenerate and universal are some of the salient features of the genetic code. Explain.

Q3. Draw a labeled schematic structure of a transcription unit. Explain the function of each component of the unit in the process of transcription.

Q4. (a) Who proposed the concept of lac operon?
(b) Draw a labeled schematic representation of a lac operon.
(c) Explain how does this operon get switched 'on' and 'off'

Q5. Describe the experiment of Frederick Griffith on bacterium Streptococcus pneumonia. Mention the important conclusion(s).

Q6. Who proposed that DNA replication is semiconservative? How did Meselson and Stahl prove it experimentally?

Q7. (a) What did Meselson and Stahl observe when
(i) They cultured E.Coli in a medium containing $^{15}NH_4$ Cl for a few generations and centrifuged the contents?
(ii) They transferred one such bacterium to the normal medium of NH_4 Cl and cultured for two generations?
(b) What did Meselson and Stahl conclude from this experiment? Explain with the help of diagrams.
(c) Which is the first genetic material? Give reasons in support of your answer.

Q8. (a) How did Griffith explain the transformation of R-strain (non-virulent) bacteria into S-Strain (virulent)?
(b) Explain how did Avery, MacLeod and McCarty determine the biochemical nature of the molecule responsible for transforming
R-Strain bacteria into S-Strain bacteria.

Q9. How did Alfred Hershey and Martha Chase arrive at the conclusion that DNA is the genetic material?

Q10. Where do transcription and translation occur in bacteria and eukaryotes respectively? Explain the complexities in transcription and translation in eukaryotes that are not seen in bacteria.

Q11. (i) Describe the role of RNA polymerases in transcription in bacteria and in eukaryotes.
(ii) Name the scientist who postulated the role of an "adapter" in protein synthesis. Name the adapter molecule.

Q12. (i) DNA polymorphism is the basis of DNA finger printing technique. Explain.
(ii) Mention the causes of DNA polymorphism.

Q13. (a) State the arrangement of different genes that in bacteria is referred to as ' operon'
(b) Draw a schematic labeled illustration of lac operon in a 'switched on' state.
(c) Describe the role of lactose in lac operon.

Q14. (a) Explain the process of aminoacylation of tRNA. Mention its role in translation.
(b) How do ribosomes in the cells act as factories for protein synthesis?
(c) Describe 'initiation' and 'termination' phases of protein synthesis.

Q15. (a) Write the scientific name of the bacterium used by Fredrick Griffith in his experiment.
(b) How did he prove that some 'transforming principle' is responsible for transformation of non-virulent strains of bacteria into the virulent form?
(c) (i) State the biochemical nature of 'transforming principle.
(ii) Name the scientists who proved it.

Q16. The average length of a DNA double helix in a typical mammalian cell is approximately 2.2 m and the dimension of a nucleus is about 10^{-6} m.
(a) How is it possible that long DNA polymers are packed with in a very small nucleus?
(b) Differentiate between euchromatin and heterochromatin.
(c) Mention the role of non-histone chromosomal protein.

Q17. State the aim and describe Meselson and Stahl's experiment.

Q18. Name the scientists who proved experimentally that DNA is the genetic material. Describe their experiment.

Q19. Describe Frederick Griffith's experiment on Streptococcus pneumomiae. Discuss the conclusion he arrived at.

Q20. (a) Describe the process of synthesis of fully functional mRNA in a eukaryotic cell.
(b) How is this process of mRNA synthesis different from that in prokaryotes

Q21. Describe Hershey Chase experiment. Write the conclusion they arrived at after the experiment.

Q22. Answer the following questions based on Meselson and Stahl's Experiment.

(a) Why did the scientists use $^{15}NH_4Cl$ and $^{14}NH_4Cl$ as sources of nitrogen in the culture medium for growing E.Coli.?
(b) Name the molecule(s) that ^{15}N got incorporated into.
(c) How did they distinguish between ^{15}N labeled molecules from ^{14}N ones?
(d) Mention the significance of taking E.coli samples at definite intervals for observations.
(e) Write the observations made by them from the samples taken at the end of 20 minutes and 40 minutes respectively.
(f) Write the conclusion drawn by them at the end of their experiment.

Q23. (a) Explain the process of DNA replication with the help of a schematic diagram. (b) In which phase of the cell cycle does replication occur in Eukaryotes? What would happen if cell-division is not followed after DNA replication. (C.B.S.E.2014)

Q24. (i) Name the scientist who suggested that the genetic code should be made of a combination of three nucleotides.
(ii) Explain the basis on which he arrived at this conclusion. (C.B.S.E.2014)

Q25. (a) Explain the process of DNA replication with the help of a schematic diagram.
(b) In which phase of the cell cycle does replication occur in Eukaryotes? What would happen if cell-division is not followed after DNA replication. (C.B.S.E.2014)

Q26.(i) Name the scientist who suggested that the genetic code should be made of a combination of three nucleotides.
(ii) Explain the basis on which he arrived at this conclusion.

CHAPTER-7
EVOLUTION

Q1. Name any two vertebrate body parts that are homologous to human fore-limbs

Q2. Mention the key concepts about mechanisms of biological evolution / speciation according to (i) De Vriesand (ii) Darwin

Q3. Mention the type of evolution that has brought the similarity as seen in Potato tuber and Sweet Potato.

Q4. Why are the wings of a butterfly and of a bat called analogous.

Q5. Are the thorn of Bougainvillea and tendril of Cucurbita homologous or analogous? What type of evolution has brought such a similarity in them?

Q6. According to Hardy-Weinberg principle the allele frequency of a population remains constant ($p^2 + 2pq + q^2 = 1$). How do you interpret the change of frequency of alleles in a population?

Q7. Are the wings of a bird and the fore-limb of a horse homologous or analogous or analogous? Name the type of evolution and explain the development of such structures.

Q8. Are flippers of penguin and dolphin homologous or analogous? What type of evolution has brought such a similarity in them?

Q9. Where did Homo sapiens arise initially?

Q10. Name the scientist who disproved spontaneous generation theory.
Q11. When does a species becomes founders to cause founder effect?
Q12. Name the common ancestor of great apes and man.
Q13. Mention how is mutation theory of Hugo de Vries different from Darwin's theory of natural selection.
Q14. Write the similarity between the wing of a butterfly/cockroach and the wing of a bat. What do you infer from the above with reference to evolution.
Q15. State the significance of the study of fossils in evolution.
Q16. State the significance of biochemical similarities amongst diverse organisms in evolution.
Q17. State the significance of coelacanth in evalution.
Q18. Comment on the similarity between the flippers of dolphins and penguins with reference to evlution.
Q19. Write two examples of developmental evidence for evolution from plant kingdom.
Q20. What is chemosynthesis? Name a chemosynthetic organism.
Q21. How is a sickle cell carrier at an advantage over the rest of human population in a malaria ridden area?
Q22. What is allopolyploidy? Name an allopolyploid that has succeeded as a crop. How does colchicine induce polyploidy?
Q23. What is divergent evolution? Explain taking an example of plans.
Q24. How does Darwin's finches illustrate adaptive radiation?
Q25. How does Darwin's theory of natural selection explain the appearance of new forms of life on earth?
Q26. How is Darwin's concept of evolution different from that of de Vries?
Q27. What is selection? How Artificial selection is different from natural selection?
Q28. Darwin observed a variety of beaks in small black birds inhabiting Galapogos islands. Explain what conclusions did he draw and how?
Q29. How is mutation explained by Hugo de Vries as different from Darwinian variations?
Q30. Discovery of lobed fins is considered very significant by evolutionary biologists. Explain.
Q31. (a) What is adaptive radiation?
(b) Explain with the help of suitable example where adaptive radiation has occurred to represent convergent evolution.
Q32. Explain convergent and divergent evolution with the help of example of each.
Q33. (a) How does Hardy Weinberg expression ($P^2 + 2pq + q^2 = 1$) explain that genetic equilibrium maintained in a population?
(b)List any two factors that can disturb the genetic equilibrium.
Q34. Why are the wings of butterfly and bird said to be alalogous organs? Name the type of evolution analogous orgains are a result of.
Q35. Antropogenic action can hasten the evolution. Explain with the help of a suitable example.
Q36. Explain adaptive ratiations and convergent evolution by taking example of some of

Australian marsup and placental mammals.

Q37. In England during the post industrialised period, the count of melanic moths increased in urban area but remained low in rural areas. Explain.

Q38. State the theory of biogenesis. How does Miller's experiment support this theory?

Q39. How does industrial melanism support Darwin's theory of Natural Selection? Explain.

LONG ANSWER TYPE QUESTION:

Q1. (a) Anthropogenic actions have caused evolution of species. Explain with the help of two examples.
(b) Differentiate between divergent and convergent evolution.

Q2. Explain Oparin and Haldane theory of origin of life.

Q3. What is convergent and divergent evolution? Explain with the help of example.

Q4. (a) Explain taking one example of vertebrate anatomy that evolution of life forms has occurred on earth.
(b) "Nature selects for fitness" Explain with suitable example.

Q5. Fitness is the end result of the ability to adapt and get selected by nature. Explain with suitable example.

Q6. (a) Natural Selection operates when nature selects for fitness. Explain.
(b) The rate of appearance of new forms is linked to the life span of an organism. Explain with the help of a suitable example.

Q7. Explain the salient features of Hugo de Vries-theory of mutation. How is Darwins theory of natural selection different from it? Explain.

Q8. (a) Name the primates that lived about 15 million years ago. List their characteristic features.
(b) (i) Where was the first man-like animal found.
(ii) Write the order in which Neanderthals. Homo habilas and Homo erectus appeared on earth. State the brain capacity of each one of them.
(iii) When did modern Homo Sapiens appear on this planert?

Q9. (a) Explain Darwinian theory of evolution with the help of one suitable example. State the two key concept of the theory.
(b) Mention any three characteristics of Neanderthal man that lived in near east and central Asia.

Q10. (a) Explain Darwinian theory of evolution with the help of one suitable example. State the two key concept of the theory.
(b) Mention any three characteristics of Neanderthal man that lived in near east and central Asia.

CHAPTER-8
HUMAN HEALTH AND DISEASES

Q1. What is vaccine? Give an example of a vaccine produced by recombinant technology

Q2. Why are stimulants and hallucinogens categorized as psychotropic drugs? Give example of each of two types mentioned.

Q3. A person has been diagnosed as HIV positive.
(i) Name the test which the person underwent. (ii) Write full name of pathogen involved and describe its structure. (iii) Which particular cells of this person are likely to get destroyed.

Q4. What is the other name of filarial? Give the scientific name of causative germ of elephantiasis.

Q5. Name and explain the type of barrier of innate immunity where some cells release interferons when infected.

Q6. What are oncogenes ? Explain.

Q7. List any four danger signals of cancer.

Q8. Why is blood group identification not required for transfusing serum?

Q9. What are second generation vaccines?

Q10. Describe the structure of immunoglobin antibody. Draw a diagram showing the formation of antigen-antibody complex and label the parts.

Q11. Write down the terms in expanded form.
(i) AMIS (ii) CMIS (iii) NACO

Q12. (i) How and at what stage does Plasmodium enter into human body?
(ii) With the help of flow chart only show the stages of asexual reproduction in the life of the parasite in the infected human.
(iii) Why does the victim show symptoms of high fever?

Q13. (a) Name the infective stages of Plasmodium which Anopheles mosquito takes in along the blood meal from an infected person.
(b) Why does the infection cause fever in humans?
(c) Give a flow chart of the part of life cycle of this parasite passed in the insect.

Q14. (a) Name the respective forms in which the malarial parasite gains entry into (i) Human and (ii) Body of female Anopheles.
(b)Name the hosts where the sexual and the asexual reproduction of malarial parasite respectively.
(c)Name the toxin responsible for the appearance of symptoms of malaria in humans. Why do these symptoms occur periodically?

Q15. Name the type of cells the AIDS virus first enters into after getting inside the human body. Explain the sequence of events that the virus undergoes within these cells to increase its progeny.

Q16. Name one plant and the addictive drug extracted from its latex. How does this drug affect the human body?

Q17. (a) Explain the property that prevents normal cells becoming cancerous.

(b) All normal cells have inherent characteristics of becoming cancerous. Explain.

Q18. List the specific symptoms of pneumonia. Name the causative organism.

Q19. How does spleen act as a lymphoid organ? Explain.

Q20. What is colostrum? Why is it important to be given to new born infants?

Q21. (a) Name the virus that causes AIDS in humans.
(b) Explain the sequence of events that flows when this virus attacks to cause immunodeficiency in humans.

Q22. How is innate immunity different form the immunity that you acquire through vaccines? Describe any two ways by which innate immunity can be accomplished.

Q23. (a) Name the lymphoid organ in humans where all the blood cells are produced.
(b) Where do the lymphocytes produced by the lymphoid organ mentioned above migrate and how do they affect immunity.

Q24. Name the specific symptoms of typhoid. Name its causative agent.

Q25. Write the name of any two opiate narcotics and their harmful effects.

Q26. An antibody is represented by H_2L_2. Explain

Q27. Name the host and the site where the following occur in the life cycle of a malarial parasite
(a) Formation of gametocytes.
(b) Fusion of gametes.

Q28. Name the type of human cell HIV attacks at its entry into the body. Explain the events that occur in the cell which further lead to cause immunodeficiency syndrome.

Q29. Define the term 'health'. Mention any two ways of maintaining it.

Q30. Why does a doctor administer tetanus antitoxin and not a tetanus vaccine to a child injured in a road side accident with a bleeding wound? Explain.

Q31. Name an opioid drug and its source plant. How does the drug affect the human body?

Q32. Mention the name of the causal organism, symptoms and the mode of transmission of the disease amoebiasis.

Q33. (a) All human beings have cellular oncogences but only a few suffer from cancer diseases. Give reason.
(b) How is malignant tumour different from benign tumour?

Q34. Name two types of immune system in human body. Why are cell mediated and humoral immune so called?

Q35. Write the scientific names of the causal organisms of elephantiasis and ringworm in human. Mention the body parts affected by them.

Q36. Write the source and the effect of the following drugs on the human body.
(i) Morphine (ii)……. (iii) Marijuana.

Q37. How do cellular barriers and cytokine barriers provide innate immunity?

Q38. State the functions of primary and secondary lymphoid organs in humans.

Q39. (a) Name the stage of Plasmodium that gains entry into human body.
(b) Trace the stages of Plasmodium in the body of female Anopheles after its entry.
(c)Explain the cause of periodic recurrence of chill and high fever during malarial attack humans.

Q40. Trace the events that occur in the human body to cause immunodeficiency when HIV gains entry the body.
Q41. Differenctiate between benign and malignant tumours.
Q42. (i) Write the scientific names of the two species of filarial worms causing filariasis.
(ii) How do they affect the body of infected persons?
(iii) How does the disease spread?
Q43. List the two types of immunity a human body is born with. Explain the differences between the types.
Q44. Why is tabacoo smoking associated with rise in blood pressure and emphysema (oxygen deficiency in body)?
Q45. (a) Name a drug used (i) as an effective sedative and pain killer (ii) for helping patients cope with mental illness like depression but often misuse.
(b) How does the moderate and high dosage of cocaine affect the human body?
Q46. Explain the role of the following in providing defence against infection in human body
(i) Histamines (ii) Interferons (iii) B-cells.
Q47. (a) Highlight the role of thymus as a lymphoid organ.
(b) Name the cells that are released from the above mentioned gland. Mentioned gland. Mention how they help immunity.
Q48. Name the plant source of the drug popularly called " smack." How does it affect the body abuser ?
Q49. (a) Name the protozoan parasite that causes amoebic dysentery in humans.
(b) Mention two diagnostic symptoms of the disease.
(c) How is this disease transmitted to others?
Q50. Name the parasite that causes filariasis / ascariasis in humans. Mention its two diagnostic symtoms. How is this disease transmitted to others?
Q51. Name the plant source of ganga. How it affects the body of abuser?
Q52. Name two special types of lymphocytes in humans. How do they differ in their roles in ……. response?
Q53. Name the bacterium that causes typhoid. Mention two diagnostic symptoms. How is this disease transmitted to others?
Q54. (a) Name the group of viruses responsible for causing AIDS in humans. Why are these viruses to named?
(b) List any two ways of transmission of HIV infection in humans, other than sexual contact.
Q55. Name any two organisms that are responsible for ringworms in humans. Mention two diagnostic symptoms. Name the specific parts of the human body which these organisms thrive and explain why?
Q56. Name the cells that act as HIV factory in humans when infected by HIV. Explain the events that occur in the infected cell.
Q57. Name the explain the two types of immune responses in humans.
Q58. Describes the role of lymph nodes in providing immunity.
Q59. Name the plant source of cocaine. How does it affect human body.

Q60. Name the different types of cells providing cellular barriers responsible for innate immunity in humans.

Q61. Trace the life cycle of malarial parasite in the human body when bitten by an infected female Anopheles.

Q62. How does AIDS virus enter the human body? Describe its life cycle. Why does this infection shatter the immunity of the victim?

Q63. What is the basis of classifying cancer? Name and explain the different categories of cancer. Mention any two approaches for cancer treatment.

Q64. (i) Name the two type of lymphocytes involved in the specific immune system. (ii) Mention the two types of specific immunity they generate. (iii) Why is specific immunity considered to be unique in its function? Write any three special features of it.

Q65. Differentiate between active immunity and passive immunity. Give any one example where passive immunization is needed.

Q66. Differentiate between B-Cell and T-Cell of the immune system. How do the B-Cell respond to antigens?

Q67. Explain briefly the various types of disorders arising from improper immune system.

Q68. (a) Cancer is one of the most dreaded diseases. Explain 'Contact inhibition' and 'Metastasis' with respect to the disease.
(b) Name the group of genes that have been identified in normal cells that could lead to cancer. How do these genes cause cancer?
(c) Name any two techniques that are useful in detecting cancers of internal organs.
(d) Why are cancer patients often given α-interferon as part of the treatment? (2014)

Q69. Name any two types of cells that act as 'cellular barriers' to provide innate immunity in humans.

Q70. (a)Cancer is one of the most dreaded diseases. Explain 'Contact inhibition' and 'Metastasis' with respect to the disease.
(b) Name the group of genes that have been identified in normal cells that could lead to cancer. How do these genes cause cancer?
(c) Name any two techniques that are useful in detecting cancers of internal organs.
(d) Why are cancer patients often given α-interferon as part of the treatment?(2014)

CHAPTER-9

STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

Q1. Why is bagging of the emasculated flowers essential during hybridization experiments?

Q2. Mention the strategy used to increase homozygosity in cattle for desired traits.

Q3. Which one is used in apiculture: Hilsa, Apisindica, Sonalika.

Q4. Which of the following is the semi-dwarf wheat that is high yielding and disease resistant ? Pusa Shubra KalyanSona, Rana.

Q5. What is the major advantage of producing plants by micro propagation?

Q6. What is meant by biofortification?

Q7. How can pollen grains of wheat and rice which tend to lose viability within 30 minutes of their release be made available months later for breeding programmes?
Q8. State the importance of biofortification.
Q9. Name the following: (a) The semidwarf variety of wheat which is high yielding and desease resistant (b) Any one interspecific hybrid mammal.
Q10. Write the name of the following: (a) The most common species of bees suitable for apiculture (b) An improved breed of chicken.
Q11. Why is the South Indian Sugarcane preferred by agriculture?
Q12. (a) How can haploid plants plants be raised in the laboratory?
(b) Name the plant first used in India to produce haploid plants.
(c) Can haploid plants raise their own progeny? Give reason.
Q13. What is haploidy? How are haploid plants raised? How are they helpful in plant breeding?
Q14. How is autopolyploid produced? Give an example.
Q15. Expand MOET. Explain the procedure of this technology in cattle improvement.
Q16. MOET programme has helped in increasing the herd size of the desired variety of cattle. List the involved in conducting the programme.
Q17. Explain the efforts which must be put in to improve health, hygience and milk yield of cattle in a dairy farm.
Q18. (i) Mention the property that enables the explants to regenerate into a new plant.
(ii) A banana herb is virus infected. Describe the method that will help in obtaining healthy banana plant from this diseased plant.
Q19. Explain the process of artificial hybridization to get improved crop variety in (i) Plants bearing bisexual flowers (ii) Female parent producing unisexual flowers.
Q20. Mention the cause and effect of inbreeding depression in cattle. How can it be overcome? Explain.
Q21. Why should a bisexual flower be emasculated and bagged prior to artificial pollination?
Q22. What is inbreeding depression and how is it caused in organisms? Write any two advantages of inbreeding.
Q23. How can crop varieties be made disease resistant to overcome food crisis in India? Explain. One disease resistant variety in India
(a) Wheat to leaf and strips rust
(b) Brassica to white rust.
Q24. Mention the property of plant cells that has helped them to grow into a new plant in vitro condition. Explain the advantages of micropropagation.
Q25. Scientists have succeeded in recovering healthy sugarcane plants sugarcane plants from a diseased one.
(a) Name the part of the plant used as explant by the scientists
(b) Describe the procedure the scientists followed to recover the healthy parts.
(c) Name this technology used for crop improvement.

Q26. Describe the technology that has successfully increased the herd size of catte in a short-time to meet the increasing demands of growing human population.

Q27. How does culluringSpirulina solve the food problems of the growing human population?

Q28. How are biofortified Maize and Wheat considered nutritionally improved?

Q29. (a) What is the programme called that is involved in improving success rate of production of desired hybrid and herd size of cattle?

(b) Explain the method used for carrying this programme for cows.

Q30. (a) Name the Indian scientist whose efforts brought "green revolution" in India.

(b) Mention the steps that are essentially carried out in developing a new genetic variety of crop under plant breeding programme.

Long Answer type Question:

Q31. What is somatic hybrid ? Give one example. Explain the steps involved in the production of such a hybrid.

Q32. What is somatic hybridization? Explain the steps involved in the production of a somatic hybrid.

Q33. (a) Name the nematode that infests and damages Tobacco roots.

(b) How are transgenic Tobacco plants produced to solve this problem?

Q34. (a) Name the technology that has helped scientists to propagate on a large scale the desired crops in a short duration. List the steps carried out to propagate the crops by the said technique.

(b) How are somatic hybrids obtained?

Q35 (a) Name the tropical sugar cane variety grown in South India. How has it helped in improving the sugar cane quality grown in North India?

(b) Identify 'a', 'b' and 'c' in the following table:

No.	Crop	Variety	Insect Pests
1.	Brassica	Pusa Gaurav	(a)
2.	Flat bean	Pusa Sem 2 Pusa sem 3	(b)
3.	(c)	Pusa Sawani Pusa A-4	Shoot and fruit borer

Q36. What are 'true breeding lines' that are used to study inheritance pattern of traits in plants?

Q37. (a) Name the technology that has helped scientists to propagate on a large scale the desired crops in a short duration. List the steps carried out to propagate the crops by the said technique.

(b) How are somatic hybrids obtained? 2014

Q38. How can healthy potato plants be obtained from a desired potato variety which is viral infected? Explain. 2014

CHAPTER-10

MICROBES IN HUMAN WELFARE

Q1. What is the biochemical reaction of yeast fermentation of molasses for alcoholic fermentation?
Q2. What protects nitrogenase?
Q3. What is economic value of Spirulina?
Q4. Name the group of organisms and the substrate they act on to produce biogas.
Q5. Name the organism commercially used for the production of single cell protein.
Q6. Which of the following is a fee living bacterium that can fix nitrogen in the soil?
Spirulina, Azospirillum, Sonalika.
Q7. Milk starts to coagulate when lactic acid bacteria (LAB) are added to warm milk as starter. Mention any other two benefits LAB provides.
Q8. Which of the following is a cyanobacterium that can fix atmospheric nitrogen?
Azospirillum, Ocillatoria, Spirulina.
Q9. Which of the following produces single cell proteins?
Sonalika, Spirulina, Saccharomyces.
Q10. Write the scientific name of the microbe used for fermented malted cereals and fruit juices.
Q11. Mention the source orgsnisms of gene cry I Ac and its target pest.
Q12. Mention the role of cyanobacteria as biofertilizers.
Q13. Why should biological control of pests and pathogens be preferred to the convential use of chemical pesticides? Explain hoe the following microbes act as biocontrolagents (a) Bacillus thuringiensis (b) Nucleopolyhedrovirus.
Q14. During the secondary treatment of the primary effluent, how does the significant decrease in BOD occur?
Q15. (a) How does activated sludge get produced during sewage treatment?
(b) Explain how this sludge is used in biogas production.
Q16. (a) Baculoviruses are excellent candidates for integrated pest management in an ecological sensitive area. Explain giving two reasons.
(b) What is organic farming? Why is it suggested to switch over to organic farming?
Q17. How does addition of a small amount of curd to fresh milk help in formation of curd? Mention a nutritional quality that gets added to the curd.
Q18. Mention the product and its use produced by each of the microbe listed below:
(i) Streptococcus (ii)(Lactobacillus (iii) Saccharomyces cerevisiae.
Q19. How do plants benefit from having mycorrhizal symbiotic association?
Q20. Describe how biogas is obtained from an activated sludge.
Q21. An organic farmer relies on natural predation for controlling plant pests and diseases. Justify giving reasons. Why this is considered to be holistic approach.
Q22. (a) Why do farmers prefer biofertilizers to chemical fertilizers these days? Explain.
(b) How do Anabaena and mycorrhiza act as biofertilisers?
Q23. Name the enzyme produced by Streptococcus bacterium.Explain its importance in medical science.

Q24. Name the genus to which baculoviruses belong. Describe their roleinthe integrated pest management programmes.
Q25. Why are some molecules called bioactive molecules? Give two examples of such molecules.
Q26. Give the scientific name of the microbes from which cyclosporine A and statin are obtained. Write one medical use of each one of these drugs.
Q27. Explain the different steps involved in sewage treatment before it can be released into natural water bodies.
Q28. Why is Rhizobium categorized as a 'symbiotic"?
Q29. Name the source of streptokinase/cyclosporine – A/Statin. How does the bioactive moledule function in our body.
Q30. How do mycorrhizae act as biofertilizer? Explain. Name a genus of fungi that forms a mycorrhizal association with plants.
Q31. Mention the importance of lactic acid bacteria to humans other than converting milk into curd.
Q32. How do methanogens help in producing biogas?
Q33. Name the two different categories of microbes naturally occurring in sewage water. Explain their role in cleaning sewage water into usable water.

CHAPTER-11
BIOTECHNOLOGY : PRINCIPLES AND PROCESSES

Q1. How is the action of exonuclease different from that of endonuclease?
Q2. What is the host called that produces a foreign gene product? What is this product called?
Q3. How can bacterial DNA be released from the bacterial cell for biotechnology experiments?
Q4. Mention the uses of cloning vector in biotechnology.
Q5. Biotechnologists refer to Agrobacterium tumefaciens as a natural genetic engineer of plants. Give reason to support the statement.
Q6. Why is it essential to have 'selectable marker' in a cloning vector?
Q7. Do eukaryotic cells have restriction endonuclease? Justify your answer.
Q8. What are cDNA libraries? How are they made?
Q9. How and why is the bacterium Thermusaquaticus employed in recombinant DNA technology. Explain.
Q10. (a) What are " molecular scisors"? Give one example.
(b) Explain their role in recombinant DNA technology.
Q11. Why is Agrobacterium tumefaciens a good cloning vector? Explain.
Q12. DNA being hydrophilic cannot pass through the cell membrane of a host cell. Explain how do recombinant DNA get introduced into host cell to transform the latter.
Q13. Explain the contribution of Thermusaquaticus in the amplification of a gene of interest.
Q14. What are recombinant proteins? How do bioreactors help in their production?

Q15. How is DNA isolated in purified form from a bacterial cell?
Q16. Name and explain the techniques used in separation and isolation of DNA fragments to be used in recombinant DNA technology.
Q17. Name the source of Taq polymerase. Explain the advantage of its use in biotechnology.
Q18. Name the source organism from which T_1 plasmid is isolated. Explain the use of this plasmid in biotechnology.
Q19. What is EcoRI? What does 'R' represent in this?
Q20. EcoRI is used to cut a segment of foreign DNA and that of a vector DNA to form a recombinant DNA. Show with the help of schematic diagrams.
(i) The set of palindromic nucleotide sequence of base pairs the EcoRI will recognize in both the DNA segments. Mark the site at which EcoRI will act and cut both the segments.
(ii) Sticky end formed on both the segments where the two DNA and foreign DNA join later to form a recombinant DNA. (C.B.S.E. 2010)
Q21. A recombinant DNA is formed when sticky ends of vector DNA and foreign DNA Join. Explain how the sticky ends are formed and get jointed.
Q22. (i) Mention the number of primers required in each cycle of polymerase chain reaction (PCR). Write the role of primers and DNA polymerase in PCR.
(ii) Give the characteristic feature and source of DNA polymerase used in PCR.
Q23. Explain the action of restriction endonuclease EcoRI
Q24. How are the DNA fragments separated by gel electrophoresis visualized and separated for use in constructing recombinant DNA?
Q25. Explain the process by which a bacterial cell can be made 'Competent' in recombinant DNA technology.
Q26. Why is 'Origin of replication' (Ori) required to facilitate cloning into a vector?
Q27. List the key tools used in recombinant DNA technology.
Q28. Explain the role of T1 plasmids in biotechnology.
Q29. Explain the work carried out by Cohen and Boyer that contributed immensely in biotechnology.
Q30. State the role of DNA ligase in biotechnology.
Q31. (a) A recombinant vector with a gene of interest inserted within the gene of a galactosidase enzyme is introduced into a bacterium. Explain the method that would help in selection of recombinant colonies from non-recombinant ones.
(b) Why is this method of selection referred to as " insertional inactivation"
Q32. Name the source organism that possesses,Taq polymerase. What is so special about the function of this enzyme?
Q33. How can the following be made possible for biotechnology experiments?
(a) Isolation of DNA from bacterial cell.
Reintroduction of recombinant DNA into a bacterial cell.
Q34. How is amplification of agene sample of interest carried out using polymerase chain reaction.

Q35. Explain with the help of a suitable example the naming of a restriction endonuclease.
Q36. State how has *Agrobacterium tumifaciens* been made a useful cloning vector to transfer DNA to plant cells.

LONG ANSWER TYPE QUESTION:

Q37. (a) Mention the role of vector s in recombinant DNA technology. Give any two examples.
(b) With the help of diagrammatic representation only, show the steps of recombinant DNA technology.
Q38. (a) Why are engineered vectors preferred by biotechnologists for transferring the desired genes into another organism?
(b) Explain how do "ori" selectable markers" and" cloning sites" facilitate cloning into a vector?
Q39. What is bioreactor? Draw a labeled diagram of asparged stirred bioreactor. Explain its functioning.
Q40. (i) Describe the characteristics a cloning vector must possess.
(ii) Why DNA cannot passs through cell membrane? Explain. How is a bacterial cell made competent to take up recombinant DNA from the medium.
Q41. If a desired gene is identified in an organism for some experiments, explain the process of the following:
(i) Cutting the desired gene at specific location.
(ii) Synthesis of multiple copies of this desired gene.
Q42. (a) With the help of diagrams show the different steps in the formation of recombinant DNA by action of restriction endonuclease enzyme EcoRI.
(b) Name the technique that is used for separating the fragments of DNA cut by restriction endonuclease.
Q43. How are 'sticky ends' formed on a DNA strand? Why are they so called?
Q44. Write the role of *Ori* and 'restriction' site in a cloning vector pBR322.

CHAPTER-12
BIOTECHNOLOGY AND ITS APPLICATIONS

Q1. A multinational company outside India tried to sell new varieties of turmeric without proper patent rights. What is such an act referred to?
Q2. Suggest any two techniques which can help in early detection of bacterial/viral infections much before the symptoms appears in the body.
Q3. How does silencing of specific mRNA in RNA interference prevent parasitic infestation?
Q4. Name any two techniques that serve the purpose of early diagnosis of some bacterial/viral human diseases.
Q5. What is genetically modified food? What are the dis-advantages of this food?
Q6. Write full form of ELISA. Give an example of the clinical application of 'ELISA' test.
Q7. Describe the responsibility of GEAC, set up by the Indian Government.

Q8. Nematode specific genes are introduced into the tobacoo plants using Agrobacterium vectors to develop resistance in tobacco plants against nematodes. Explain the events that occur in tobacco plant to develop resistance.

Q9. How is a transgenic tobacco plant protected against Meloidogyne incognita? Explain the procedure.

Q10. Expand the name of enzyme ADA. Why is the enzyme essential in the human body? Suggest a gene therapy for its deficiency.

Q11. Plasmid is a boon to biotechnology. Justify this statement quoting the production of human insulin as an example.

Q12. Highlight any four advantages of genetically modified organisms (GMOs).

Q13. How did EI Lilly company go about preparing the human insulin? How is the insulin thus produced different from that produced by the functional human insulin gene?

Q14. Why is introduction of genetically engineered lymphocytes into an ADA deficiency patients not a permanent cure? Suggest a possible permanent cure.

Q15. How does RNA interference help in developing resistance in Tobacco plant agains nematode infection. (C.B.S.E.2010)

Q16. How did Eli Lilly synthesize the humun insulin? Mention one difference between this insulin and the one produced by the human pancreas.

Q17. Name the insect pest that is killed by the product of cry I Ac gene. Explain how the gene makes the plant resistant to the insect pest.

Q18. Why do the toxic insecticidal proteins secreted by Bacillus thurigniensis kill the insect and not the bacteria?

Q19. Name the fist transgenic cow developed and explain the improvement in the quality of the product produced by it.

Q20. Explain the process of RNA interference.

Q21. Explain how a hereditary disease can be corrected. Give an example of first successful attempt made towards correction of such diseases.

Q22. How is “Rosie” considered different from a normal cow? Explain.

Q23. Biopiracy should be prevented. State why and how.

Q24. What happens when Meloidogyneingonnita consumes cells with RNAi gene?

(a) Mention the cause and the body system affected by ADA deficiency in humans.

(b) Name the vector used for transforming ADA-DNA into recipient cells in humans. Name the recipient cells.

Q25. (a) How does cry I Ac gene express itself in its host?

(b) State the role of this gene in controlling the infestation of bollworm.

Q26. How has recombinant technology helped in large scale production of vaccines? Explain giving one example.

Q27. Name the genes responsible for making Bt cotton plants resistant to bollworm attack. How do such plants attain resistance against bolloworm attacks? Explain.

Q28. (a) Tobacco plants are damaged severaly when infested with Meloidogyne incognita. Name and explain the strategy that is adopted to stop this infestation.

Q29. Name the vector used for introducing nematode specific gene in Tobacco plant.

Q30. Explain the synthesis of genetically engineered human insulin.
Q31. What is gene therapy? Illustrate using the example of adenosine deaminase (ADA) deficiency.
Q32. (a) What is plasmid? (b) What is meant by ADA deficiency? How is gen therapy a solution to this problem? Why is it not a permanent cure?
Q33. Explain the steps involved in the production of genetically engineered insulin.
Q34. One of the main objectives of biotechnology is to minimize the use of insecticides on cultivated crops. Explain with the help of suitable example how insect resistant crops have been developed using techniques of biotechnology.
Q35. (a)How is mature insulin different from proinsulin secreted by pancreas in humans?
(b) Explain how was human functional insulin produced using rDNA technology.
(c) Why is the functional insulin thus produced considered better than the ones used earlier by diabetic patients?
Q36. What is ADA deficiency? Describe three methods to cure it.

Q37. (a) Name the source from which insulin was extracted earlier. Why is this insulin no more in use by diabetic people?
(b) Explain the process of synthesis of insulin by Eli Lilly company. Name the technique used by the company.
(c) How is insulin produced by human body different from the insulin produced by the above mentioned company.
Q38. Name the process involved in the production of nematode resistant tobacco plants, using genetic engineering. Explain the strategy adapted to develop such plants.
Q39. Describe the various stages involved in gene transfer for commercial production of human insulin by Eli Lily.
Q40. How did the process of RNA interference help to control the nematode from infecting the roots of tobacco plants?
Q41. What is bio-piracy? State the initiative taken by the Indian Parliament against it.2014

CHAPTER-13
ORGANISMS AND POPULATION

Q.1 Rearrange the following levels in their correct organizational sequence: Landscape, Organism, Ecosystem, Population, Biosphere.
Q.2 What does ecological niche of an organism represent?
Q.3 Define ecotone.
Q.4 When and why do some animals like frogs hibernate?
Q.5 Which one of the two, stenothermals and eurythermals, show wide range of distribution on earth and why?
Q.6 List any two adaptive features evolved in parasites enabling them to live successfully on their hosts.

Q.7 When and why do some animals like snails go into aestivation?

Q.8 Why is the polar region not a suitable habitat for tiny humming birds?

Q.9 Mention any two significant roles predation play in nature.

Q.10 Name the type of interaction seen between Whale and the Barnacles growing on its back.

Q.11 An orchid plant is growing on the branch of a mango tree. How do you describe this interaction between orchid and mango tree.

Q.12 How does camouflage help an insect?

Q.13 If 8 individuals in a laboratory population of 80 died in a wek, what would be the death rate for population for the said period?

Q.14 In a pond there were 20 Hydrilla plants. Through reproduction 10 new Hydrilla plants were added in a year. Calculate the birth rate of the population.

Q.15 In a pond there were 200 frogs. 40 more were born in a year. Calculate the birth rate of the population.

Q.16 How do animals like fish and snails avoid summer related unfavourable conditions?

Q.17 Why do predators avoid eating Monarch Butterfly? HOw does the butterfly develop the protective feature?

Q.18 Why are green plants not found beyond a certain depth in the ocean?

Q.19 Pollinating species of wasps show mutualism with specific fig plants. Mention the benefits the females wasps derive from the fig trees from such an interaction.

Q.20 Why are cattle and goats not seen browsing on Calotropis growing in the fields?

Q.21 Why are some organisms called eurythermals and some othrs are stenohaline.

Q.22 Write what do phytophagous insects feed on.

Q.23 (i) Cuscuta and Shoeflower
(ii) Orchid growing on Mango tree.
(iii) Whale and Barnacle growing on its back.
(iv) Sea Anemone and Hermit Crab.

Q.24 Name and explain any three adaptations of mangroves to the conditions prevailing in sunderbans.

Q.25 Explain the relationship between biotic potential and environmental resistance.

Q.26 (i) What are tropical rain forests?
(ii) Name any two dominant plant species of such forests in India.
(iii) Why is soil in tropical deciduous forests richer in nutrients than in tropical rain forests?

Q.27 Describe the special adaptations of xerophytes with respect to root system, stem and leaves.

Q.28 What does S-shaped pattern of population growth represent? How is J-shaped pattern different from it and why?

Q.29 How are ephemeral plants adapted to withsand hot and dry environment? Explain.

Q.30 State the relationship of biotic potential and enrironmental resistance.

Q.31 How do organisms manage the stressful conditions existing intheir habitat for short duration? Explain with the help of one example each.

Q.32 Certain species of wasps are seen to frequently visit flowering Fig trees. What type of interaction is seen between them and why?

Q.33 The "Clown fish" lives among the tentacles of Sea-Anemone. What is this interaction between them called and why?

Q.34 Egrets are often seen alongwith grazing cattle. How do you refer to this interaction? Give a reason for this association.

Q.35 (a) What is 'r' in the population equation given below dN/dt=rN
(b) How does the increase and the decrease in the value of 'r' affect the population size?

Q.36 How does the Mediterranean orchid Ophrys ensure its polluation by bees.

Q.37 (a) How is Cuscuta adapted to be a parasitic plant?
(b) Why do cattle avoid browsing on Calotropis plants? Explain

Q.38 What is meant by replacement level? Why is it always slightly higher than two?

Q.39 Name the important defence mechanisms in plants against harbivory.

Q.40 How do organisms like fungi, zooplankton and bears overcome the temporary shortlived climate stressful condtions? Explain.

Q.41 Differentiate between the following interspecific interactions in a population
(i) Mutualism and competition (ii) Commensalism and amensalism.

Q.42 Why are small animals rarely found in the polar regions?

Q.43 Mention four adaptive features that help cacti survive in xeric environment.

Q.44 Name the type of interaction seen in each of the following examples.
(i) Ascaris worms living in the intestine of human.
(ii) Wasp pollinating fig inflorescence.
(iii) Clown fish living among the tentacles of sea anemone.
(iv) Mycorrhizae living is the roots of higher plants.
(v) Disappearance of smaller barnacles when malanus dominated in the coast of Scotland.

Q.45 Water is very essential for life. Write any three features for plants and animals which enable them to survive in water scarce environment.

Q.46 How do organisms cope with stressful external environmental conditions which are localized or of short duration?

Q.47 Explain the response of all communities to environment over time.

Q.48 Bear hibernates whereas some species of zooplankton enter diapause to avoid stressful external conditions. How are these two ways different from each other?

Q.49 How does our body adapt to low oxygen availability at high altitude?

Q.50 Why do Clown Fish and sea anemones pair up? What is their relationship called?

Q.51 Some organisms suspend their metabolic activities to survive in unfavourable conditions. Explain with the help of any four examples.

Q.52 Explain brood parasitism with the help of an example.

Q.53 Why are small birds like humming birds not found in polar regions? Explain.

Q.54 (a) List any three ways of measuring population density of a habitat.

(b) Mention the essential information that can be obtained by studying the population density of an organism.

Q.55 What is the association between bumble bee and its favourite orchid Ophrys? How would extinction or change of one would affect the other?

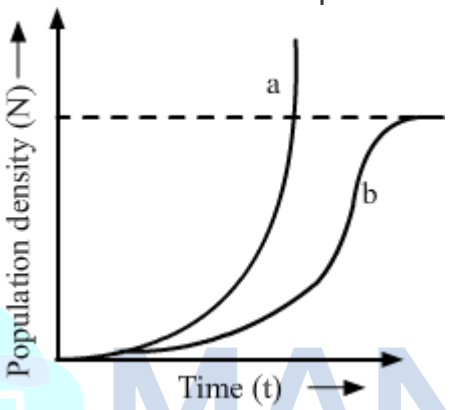
Q.56 Give an explanation of the above equation.

(a) List any four abiotic components that lead to variations in the physical and chemical conditions of different habitats.

(b) Explain the impact of these component on the distribution of organisms in different habitats.

Q.57 Draw and explain a logistic curve for a population of density (N) at a time (t) whose intrinsic rate of natural increase is (r) and carrying capacity (k).

Q58. Study the graph given below and answer the questions that follow :



(i) Write the status of food and space in the curves (a) and (b).

(ii) In the absence of predators, which one of the two curves would appropriately depict the prey population?

(iii) Time has been shown on X-axis and there is a parallel dotted line above it. Give the significance of this dotted line.

Q58. Construct an age pyramid which reflects a stable growth status of human population.

Q59. Give an example of an organism that enters 'diapause' and why. 2014

Q60. Construct an age pyramid which reflects a stable growth status of human population.

CHAPTER-14
ECOSYSTEM

Q.1 What does secondary productivity in an ecosystem indicate? List any two factors by which productivity is limited in aquatic system.

Q.2 State the differences between the first trophic levels of detritus food chain and grazing food chain.

Q.3 Name the pioneer species on a bare rock. How do they help in establishing the next type of vegetation? Mention the type of climax community that will ultimately get established.

Q.4 Construct an ideal pyramid of energy when 1,000,000 joules of sunlight is available.

Label all the trophic levels.

Q.5 Name the pioneer and climax species in a water body. Mention the changes observed in the biomass and the biodiversity of the successive seral communities developing in the water body.

Q.6 Construct a pyramid of biomass starting with phytophlankton. Label three trophic levels. Is the pyramid upright or inverted? Why ?

Q.7 What is primary productivity? Give the range of primary productivity in different ecosystems of the world.

Q.8 Name the type of food chains responsible for the flow of larger fraction of energy in an aquatic and a terrestrial ecosystem respectively. Mention one difference betweenthe two food chains.

Q.9 Why are herbivores considered similar to predators in the ecological context? Explain.

Q.10 List the features that make a stable biological community.

Q.11 Explain the function of 'reservoir' in a nutrient cycle. List the two types of nutrient cycles in nature.

Q.12 Explain with the help of two examples, how the pyramid of numbers and pyramid of biomass can look inverted.

LONG ANSWER TYPE QUESTIONS:

Q.13 Describe the process of decomposition of detritus under the following heads: Fragmentation, reaching, catabolism, humification and mineralization.

Q.14 (a) Trace the succession of plants on a dry bare rock.
(b) How does phosphorus cycle differ from carbon cycle.

Q.15 Draw the pyramids of biomass in a sea and in a forest. Explain giving reasons why the two tryramids are different. (b) Pyramid of energy is always upright. Explain.

Q.16 (a) Explain primary productivity and the factors that influence it.
(b) Describe how oxygen and chemical composition of detritus control decomposition do.

Q.17 (a) Healthy ecosystems are the base of wide range of (ecosystem) services. Justify.
(b)Explain the differences and similarities between hydrarch and xerarch succession of plants.

Q.18 (a) Explain the significance of ecological pyramids with the help of an example.
(b)Why are the pyramids referred to as upright or inverted Explain

Q.19 How does primary succession start in water and lead to the climax community? Explain.

Q20. (i) What is primary productivity ? Why does it vary in different types of ecosystems?
(ii) State the relation between gross and net primary productivity.

Q21. Apart from being a part of the food chain, predators play other important roles. Mention any two such roles supported by examples.

Q22. How is 'stratification' represented in a forest ecosystem?

CHAPTER 15

BIODIVERSITY AND CONSERVATION

Q.1 Expand IUCN.

Q.2 What does the term genetic diversity refer to? What is the significance of large genetic diversity in a population ?

Q.3 India has more than 50,000 strains of rice. Mention the level of biodiversity it represents.

Q.4 Write the importance of cryopreservation in conservation of biodiversity.

Q.4 Why is Eichhorniacrassipes nicknamed “Terror of Bengal”.

Q.5 What is cryopreservation ? Give its one use.

Q.6 What is biodiversity ? Why is it matter of concern now?

Q.7 What is alpha/beta diversity in an ecosystem? What is the significance of large genetic diversity in a population?

Q.8 What are exotic species? Explain with the help of two examples how the exotic species disturb the native species of an ecosystem.

Q.9 A particular species of wild cat is endangered. In order to save it from extinction which is desirable approach, in situ or ex situ? Justify your answer and explain the difference between the two approaches.

Q.10 In the biosphere immense biological diversity exists at all levels of biological organization. Explain any two levels of biodiversity.

Q.11 Biodiversity must be conserved as it plays an important role in many ecosystem services that nature provides. Explain any two services of the ecosystem.

Q.12 Why certain regions have been declared as biodiversity “hot spot” by environmentalists of the world? Name any two “hot spot” regions of India. explain why there is more species biodiversity in tropical latitudes than in temperate ones.

Q.14 Alien species are a threat to native species. Justify taking examples of an animal and a plant alien species.

Q.15 Justify with the help of an example where a deliberate attempt by humans had led to the extinction of a particular species.

Q.16 State the use of biodiversity in modern agriculture.

Q.17 Differentiate between in situ and ex situ approaches of conservation of biodiversity.

Q.18 Explain giving an example how extinction is one of the causes of loss of biodiversity. List the three other causes also (without description).

Q.19 Explain ‘river popper’ hypothesis. Name the ecologist who proposed it.

Q.20 Alien species are highly invasive and are threat to indigenous species. Substantiate this statement with any three examples.

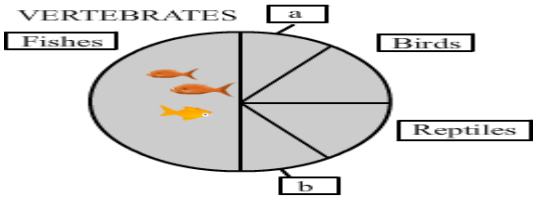
Q.21 List the reasons that account for the greater biological diversity in tropics. **(C.B.S.E 2012)**

Q.22 What are the two types of desirable approaches to conserve biodiversity? Explain with examples bringing out the difference between the two types.

Q.23 (a) Taking one example each of habitat loss and fragmentation, explain how are the two responsible for biodiversity loss.

(b) Explain two different ways of biodiversity conservation.

Q24. Identify 'a' and 'b' in the figure given below representing proportionate number of major vertebrate taxa.



CHAPTER 16
ENVIRONMENTAL ISSUES

Q.1 Name any three gases contributing to green house effect.
Q.2 Which type of UV radiations can be lethal to organims ?
Q.3 In which part of atmosphere is ozone layer found ?
Q.4 Name the world's most problematic aquatic weed. What is the nature of water body in which the weed grows abundantly?
Q.5 Between amphibians and birds, which will be able to cope with global warming? Give reason.
Q.6 BOD of two samples of water A and B were 120 mg/L respectively. Which sample is more polluted ?
Q.7 Mention the information that the health workers derive by measuring BOD of a water body.
Q.8 Name two green house gases produced by anaerobic microbes.
Q.9 Why is the use of unleaded petrol recommended for motor vehicles equipped with catalytic converter ?
Q.10 Write the unit used for measuring ozone thickness.
Q.11 How do algal blooms effect the life in water bodies ?
Q.12 Why is it desirable to use only unleaded petrol in vehicles fitted with catalytic converters?
Q.13 Mention the effect of global warming on the geographical distribution of stenothermals like amphibians.
Q.14 Many villagers near industrial area suffer from "blue baby syndrome". How is this problem caused?
Q.15 What gases cause stratospheric ozone depletion ? What is the result of this depletion?
Q.16 What is photochemical smog composed of? How does this affect the plants?
Q.17 What is optimum percentage of forest area recommended by National Forest Policy (1988) for the plains and hills respectively ? List any four problems caused due to be deforestation .
Q.18 What is eutrophication ? Explain its consequences on the life of plants and animals living in such waters. Why is oxygen depletion in eutrophicated water faster at night than during the day ?

Q.19 Name and define the environment related terms
(i) DDT accumulated in a three step food chain will be maximum in secondary consumer.
(ii) Pertaining to causing algal bloom.

Q.20 What is biological magnification ? Explain how DDT as a water pollutant undergoes biological magnification.

Q.21 Thermal power plants are inevitable in an industrial and densely populated country like ours. What harm, do they do to the environment ? Also mention any precaution that could be taken to save the environment.

Q.22 It has been recorded that the temperature of the earth's atmosphere has increased by 0.60°C
(a) What has caused this increase ?
(b) Explain its consequences.

Q.23 DDT content in the water of lake that supplies drinking water to the nearby villages, is found to be 0.003ppm. The king fishers of that area reported to have 2.0 ppm of DDT. Why has the concentration increased in these birds? What harm will this cause to the bird population? Name the phenomenon.

Q.24 A factory drains its waste water in nearby lake. It has caused algal bloom
(a) How has the algal bloom been caused? (b) What would be the consequences?
(c) name the
phonomenon that caused it.

Q.25 Explain accelerated eutrophication. Mention any two consequences of this phenomenon.

Q.26 A crane had DDT level as 5ppm in its body. What would happen to the population of such birds? Explain giving reasons.

Q.27 Explain the causes of global warming. Why is it a warning to making?

Q.28 Explain the causes of algal bloom in a water body. How does it affect an ecosystem?

Q.29 (a) Why are the colourfulpolysterene and plastic packages used for protecting the food considered an environmental menace?
(b)Write about the remedy found for the efficient use of plastic waste by Ahmed Khan of Bangalore.

Q.30 Explain giving reason why thermal plants are not considered ecofriendly?

Q.31 List any four factors which determine the amount of dissolved oxygen in water. Explain in brief the harmful effects of nitrate, fluoride and arsenic salts in groundwater on humans.

Q.32 (a) What depletes ozone in the stratosphere ? How does this affect human life ?
(b) Explain bio magnificationof DDT in an aquatic food chain. How does it affect the bird population ?

Q.33 (a) Name the green house gases. How do they affect the life on earth ?
(b) Describe the causes of eutrophication of a lake.

Q.34 Write the name of the organism that is referred to as the 'Terror of Bengal'.