BOSTON PUBLIC SCHOOL

CLASS-12TH

SESSION 2024-25

BIOLOGY (044)

REVISION WORK- SHEET

1. When and where do tapetum and synergids develop in flowering plants? Mention their functions.

2. Where are the following structures present in a male gametophyte of an angiosperm ? Mention the function of each one of them.

    a. Germ pore
    b. Sporopollenin
    c. Generative cell

3. Draw L.S. of an embryo of grass and label its parts.
4. A mature embryo-sac in a flowering plant may possess 7-cells, but 8-nuclei. Explain with the help of diagram only.
5. Do all pollen grains remain viable for the same length of time? Support your answer with two suitable examples.

    (b) How are pollen grains stored in pollen banks? State the purpose of storing pollen grains in these banks.

6. I. Describe the sequence of the process of microsporogenesis in angiosperms.
    ii. Draw a labelled diagram of a 2-celled final structure formed.
7. (i) Write the characteristic features of anther, pollen and stigma of wind pollinated flowers.

    (ii) How do flowers reward their insect pollinators? Explain

8. Differentiate between microsporogenesis and megasporogenesis.

9. Explain the structure of an anatropous ovule with a neat labelled diagram?

10. Differentiate between geitonogamy and xenogamy.

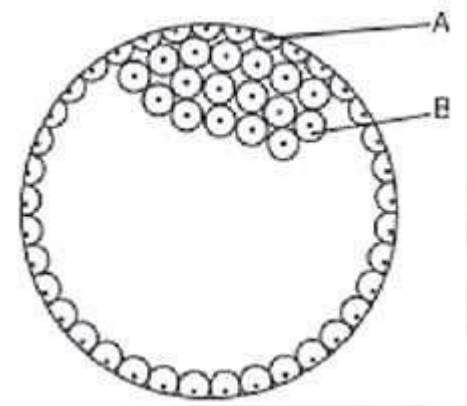
11. Why are cleistogamous flowers invariably autogamous?

12. (I) Give a schematic representation showing the events of

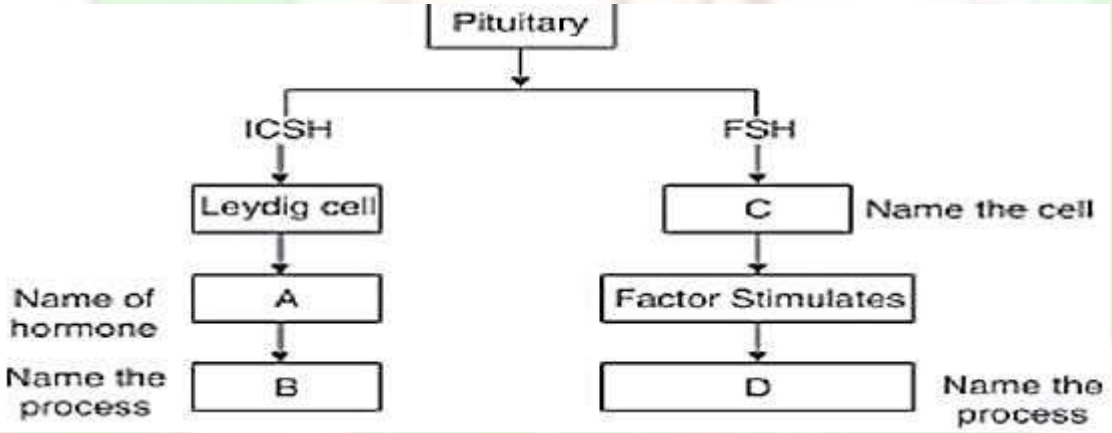
spermatogenesis in human male.

(II) Describe the structure of a human sperm.

13. In the given figure, give the name and functions of parts labeled A and B.



14. Given below is an incomplete flow chart showing influence of hormone on gametogenesis in male, observe the flow chart carefully and fill in the blank A, B, C and D.



15. What is the number of chromosomes in the following cells? Primary oocyte, secondary oocyte, ootid and follicle.
16. Draw a diagram of the T.S. of seminiferous tubule of testis of an adult human male & label any four parts in it.
17. Mention the name and role of hormones which are involved in regulation of gamete formation in human male.
18. Three of the steps of neuro endocrine mechanism in respect of parturition are mentioned below.

Write the missing steps in proper sequence.

(a) Signals originate from fully developed foetus and placenta.

(b) _____.

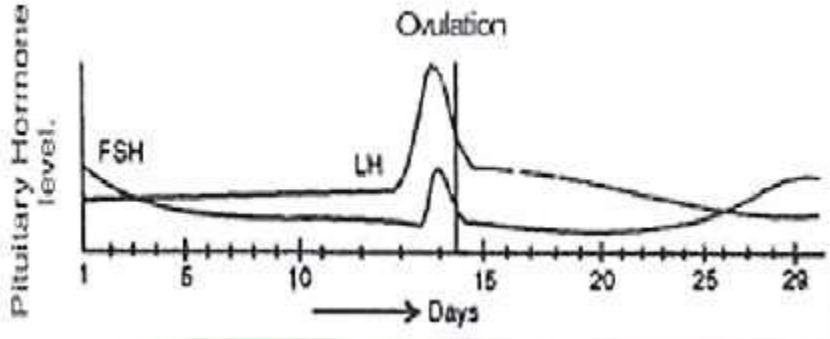
(c) _____.

(d) Oxytocin causes strong uterine contraction

(e) Uterine contraction stimulates further secretion of oxytocin.

(f) _____.

19. (a) Read the graph given below. Correlate the ovarian events that take place in the human female according to the level of the pituitary hormone during the following day.



(i) 10th - 14th days (ii) 14th -15th days

(iii) 16th - 23th days (iv) 25th - 29th days

(If the ovum is not fertilised)

(b) What are the uterine events that follow beyond 29th day if the ovum is not fertilised?

20. T.S. of mammalian testis revealing seminiferous tubules show different types of cell.

(i) Name the two types of cells of germinal epithelium.

(ii) Name of cells scattered in connective tissue and lying between seminiferous tubules.

Differentiate between them on the basis of their functions.

21. Differentiate between spermatogenesis and oogenesis.

22. . Give another name for sexually transmitted diseases. Name two sexually transmitted diseases which are curable and two diseases which are not curable.

23. Differentiate between Vasectomy and Tubectomy.

24. Name the techniques which are employed in following cases :

(a) Transfer of an ovum collected from a donor into the fallopian tube of another female who cannot produce ova but can provide suitable environment for fertilisation and development.

(b) Embryo is formed in laboratory in which sperm is directly injected into ovum.

(c) Semen collected either from husband or a healthy donor is artificially introduced either into vagina or uterus.

25. 1. IVF is a very popular method these days that is helping childless couples to bear a child. Describe the different steps that are carried out in this technique.

2. Would you consider Gamete Intrafallopian Transfer (GIFT) as an IVF ? Give a reason in support of your answer.

26.1.IUDs are said to be effective contraceptives. Name any two commonly used IUDs and write the mode of their actions.

2.When is sterilisation advised to married couples? How is it carried out in a human male and a female, respectively.

27. 1.Explain one application of each one of the following :

a. Amniocentesis
b. Lactational amenorrhea
c. ZIFT

2. Prepare a poster for the school programme depicting the objectives of : "Reproductive and Child Health Care Programme".

28. Differentiate between incomplete dominance and co-dominance. Substantiate your answer with one example of each.

29. Explain the mechanism of ‘sex determination’ in birds. How does it differ from that of human beings?

30. 1.xplain the cause responsible in a human to have sex chromosomes as ‘XXY’ instead of ‘XX’ or ‘XY’.

2. List any two ways such individuals are different from the normal being.

31. Two heterozygous parents are crossed. If the two are liked what would be the distribution of phenotypic features in generation for a dihybrid cross?

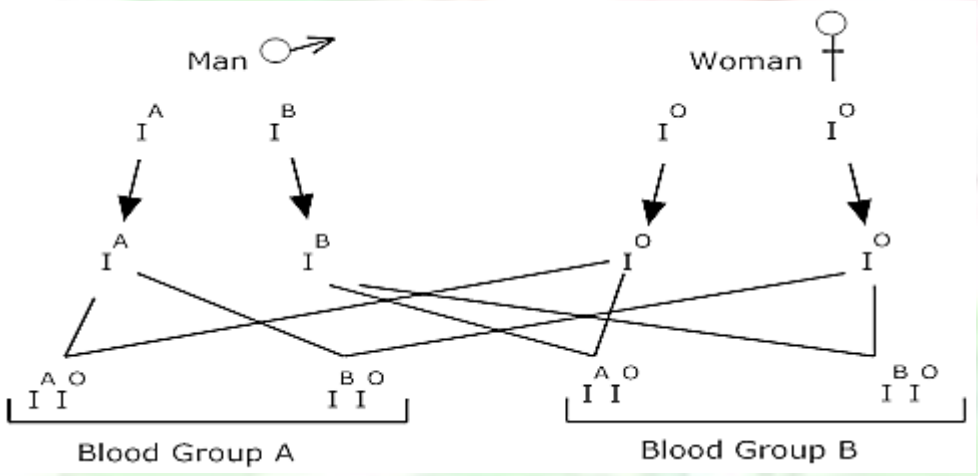
32. A woman with O blood group marries a man with AB blood group

(i) work out all the possible phenotypes and genotypes of the progeny.

(ii) Discuss the kind of dominance in the parents and the progeny in this case.

33. In Antirrhinum majus a plant with red flowers was crossed with a plant with white flowers. Work out all the possible genotypes & phenotypes of F1 & F2 generations comment on the pattern of inheritance in this case?

34. A man with AB blood group marries a woman with O group blood.



(i) Work out all the possible phenotypes & genotypes of the progeny.

(ii) Discuss the kind of domination in parents & progeny in this case?

35. In an cross made between a hybrid tall & red plant (TtRr) with dwarf & white flower (ttrr). What will be the genotype of plants in F1 generation?

36. . A dihybrid heterozygous tall & yellow pea plant was crossed with double recessive plant.

(i) What type of cross is this?

(ii) Work out the genotype & phenotype of progeny

(iii) What principle of Mendel is illustrated through result of this cross?

37. Give six points of difference between DNA and RNA in their structure/chemistry and function.

38. Explain how does the hnRNA becomes the mRNA.

OR

Explain the process of splicing, capping and tailing which occur during transcription in Eukaryotes.

39. 8.The base sequence on one strand of DNA is ATGTCTATA

(i) Give the base sequence of its complementary strand.

(ii) If an RNA strand is transcribed from this strand what would be the base sequence of RNA?

(iii) What holds these base pairs together?

40. Define bacterial transformation? Who proved it experimentally & how?

41. What does the lac operon consist of? How is the operator switch turned on and off in the expression of genes in this operon? Explain.

42. .Where do transcription & translation takes place in a prokaryotic cell? Describe the three steps involved in translation?

43. (i) State the Hardy-Weinberg principle.

(ii) When there is a disturbance in the Hardy-Weinberg equilibrium, what would it result in?

(iii) According to this principle, what is the sum total of all allelic frequencies?

44. Classify the following as examples of homology and analogy–

(i) Hearts of fish and crocodile

(ii) Wings of butterfly and birds

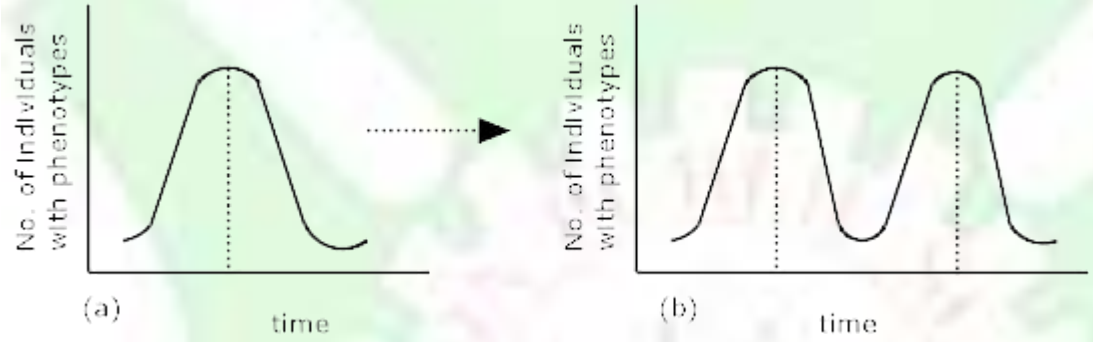
(iii) Eyes of Octopus and Mammals

(iv) Tubers of potato and Sweet potato

(v) Thorns of Bougainvillea and spines of Opuntia

(vi) Thorn of Bougainvillea and tendrils of cucurbits.

45. 4.Study the figures given below & answer the following question.

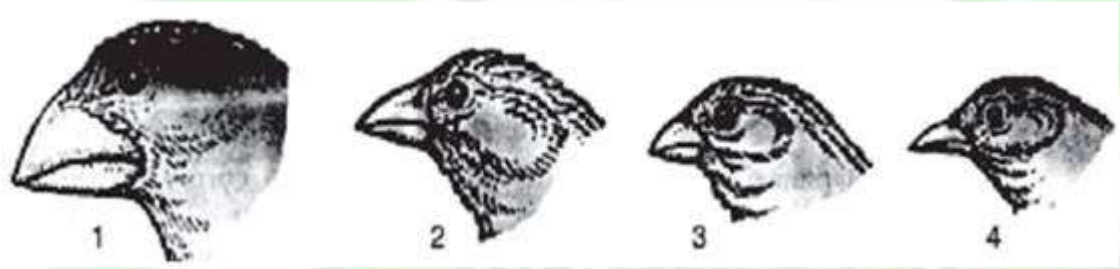


i) Under the influence of which type of natural selection would graph (a) become like graph (b).

ii) What could be the likely reason of new variations arising in a population.

iii) Who suggested natural selection as mechanism of evolution?

46. Figures given below are of Darwin’ s finches?



Variety of beaks of Darwin's finches.

(a) Mention the specific geographical area where these were found.

(b) Name and explain the phenomenon that has resulted in the evolution of such diverse species in the region.

(c) How did Darwin visit the particular geographical area?

47. 15.What are the three different ways in which selection may occur.

48. .State in what ways Stanley miller simulated the condition of :-

i) Primitive atmosphere on earth.

ii) Energy source at the time of origin of life .

iii) Formation of organic molecule of life.

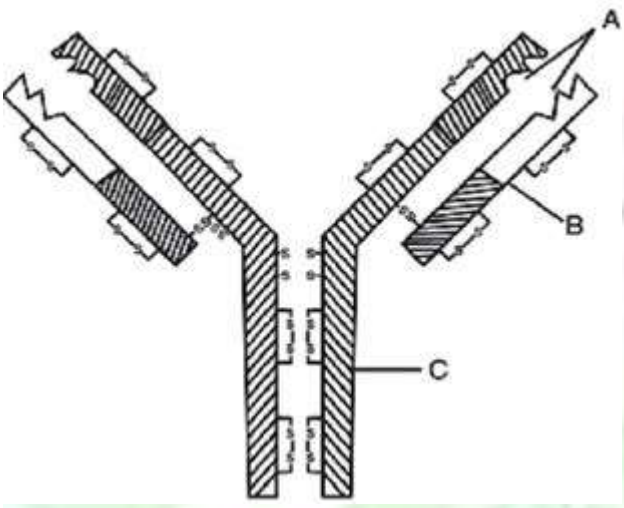
49. What are Cannabinoids? From which plant Cannabinoids are obtained? Which part of the body is affected by consuming these substances?

50. In the figure, structure of an antibody molecule is shown. Observe it and Give the answer of the following questions.

(i) Label the parts A, B and C.

(ii) Which cells produce these chemicals?

(iii) State the function of these molecules.



51. A person shows unwelcome immunogenic reactions while exposed to certain substances.

(a) Name this condition.

(b) What common term is given to the substances responsible for this condition?

(c) Name the cells and the chemical substances released which cause such reactions.

52. .What are carcinogens? What are the different types of carcinogens? Also mention the different methods of treatment of cancer?

53. (i) Differentiate between communicable & non – communicable diseases?

(ii) Name the body part & the host in which following events takes place in life cycle of plasmodium.

(a) fertilization

(b) Development of Gametophyte :-

(c) Release of sporozoites :-

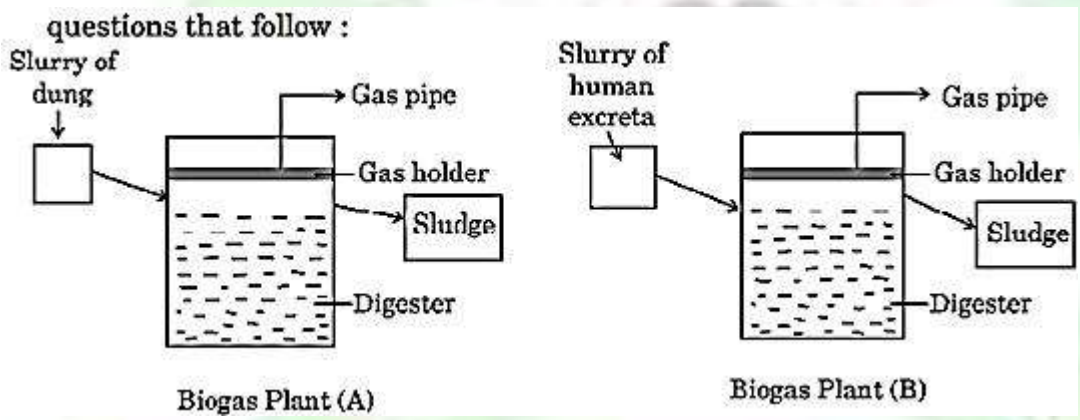
(d) Asexual Reproduction.

54. What are statins? Name the microorganism that produces this substance. How is it medically important?

55. .Describe the procedure involved in Sewage treatment?

56. .What is Biogas? How is it produced & Name the microbes invaded in Biogas production.

57. Study the given diagrams of Biogas plants - A and B and answer the questions that follow:



Which one of the two biogas plants can be used for generating gas fuel and electricity and why? Give suitable reasons in support of your answer.

58. List the events that reduce the Biological Oxygen Demand (BOD) of a primary effluent during sewage treatment.

59. A selectable marker is used in the section of recombinants on the basis of their ability to produce colour in presence of chromogenic substrate.

(a) Mention the name of mechanism involved.

(b) Which enzyme is involved in production of colour?

(c) How is it advantageous over using antibiotic resistant gene as a selectable marker?

60. .Mention the important tools required for genetic engineering technology?

61. How does plasmid differ from chromosomal DNA?

62. Mention two classes of restriction enzymes. Suggest their respective roles.

63.Represent diagrammatically the E. coli. Cloning vector PBR 322.

64. .What is Bioreactor? What are the advantages of Stirred tank Bioreactor over Shake flask. Show diagrammatically a simple Stirred tank Bioreactor?

65. A bacterium Bacillusthuringiensis produces a toxic protein named ‘cry protein’ that is lethal to certain insects but not to bacterium

(a) Why this toxin does not kill the bacteria?

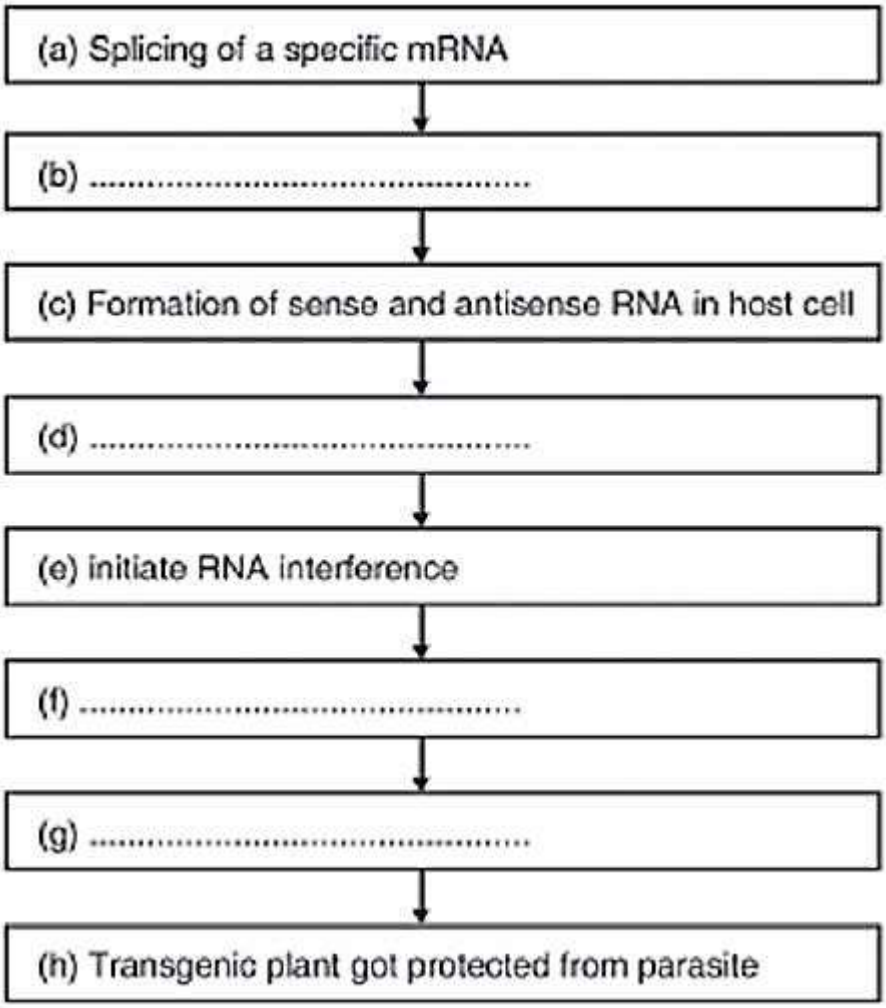
(b) What type of changes occur in the gut of insects on consuming this protein?

(c) How man has exploited this protein for his benefit?

66. Given below is an incomplete flow chart showing the process of production of nematode resistant tobacco plants based on RNAitechnique.

(i) Write the missing steps in proper sequence

(ii) At which level RNAi silences the gene?



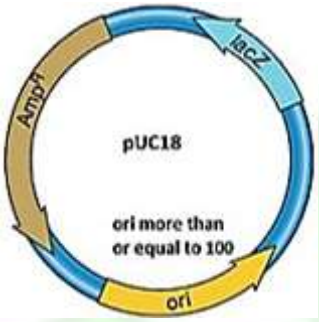
67. .What are Cry proteins? Name an organism that produces it. How has man exploited this protein to his benefit?

68. a. Simple stirred-tank bioreactors are used to produce large quantities of recombinant proteins, stirring the contents and mixing it with oxygen. Write any four other advantages of using stirred tank.

b. After downstream processing, the product of the biosynthetic stage cannot be marketed directly. Why? Give two reasons.

69. The structure below shows pUC18 which is similar to pBR322 in its function. However, they differ in some of their restriction sites and number of ori. The ori number for pBR322

is approximately 20.



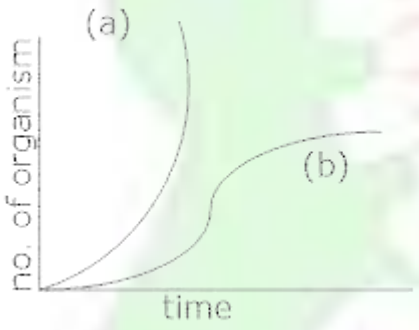
a. How are puc18 and pBR322 used in biotechnological studies?

70. a. Name three molecular diagnostic techniques for diagnosis of a disease.

b. List three advantages of molecular diagnostic techniques over conventional method of diagnosis.

71. .Mutualism often involves co-evolution of mutualists. Describe taking the example of animal plant (wasp-fig) relationship.

72. In the adjacent population growth curve :-



i) What is the name given to curve (a) & (b).

ii) What is the status of food & space in thecurve (a) & (b).

iii) In absence of predators, which curve “a” or “b” would appropriately depict the prey population?

iv) When does curve ‘b’ changes into curve ‘a’.

73. .Name& explain the bind of interaction in the following.

i) Algae & fungi in

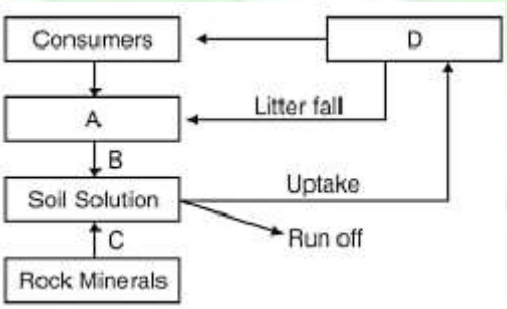
ii) Head louse & humans

iii) Hermit crab & sea anemone.

74. Orchid flower, Ophrys co-evolves to maintain resembelance of its petal to female bee. Explain how and why does it do so?

75. .Describe the logistic growth model of population along with a suitable curve. Why is this curve more realistic?

76. In the model of phosphorus cycle given below , what does A, B, C and D refer to?



77. .What do you mean by “productivity of an ecosystem? What are the types of productivity also mention the factors on which productivity of an ecosystem depends?

78. .In the pyramid of biomass, drawn below, name the two crops:-

i) one which is supported & the one which supports

ii) In which ecosystem is such a pyramid found.

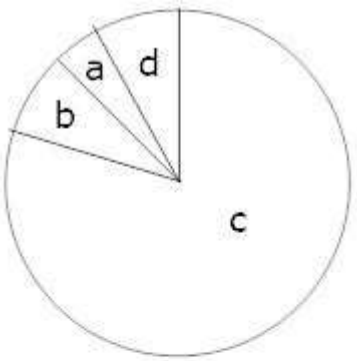
79. Hot spots are the regions of exceptionally high biodiversity . But they have become regions of accidental habitat loss too. Name the three hot spots of our country. Why are they called ‘Hot spot’?

80. .What do you mean by latitudinal gradient? What could be the possible reasons for diversity between tropic & temperate region?

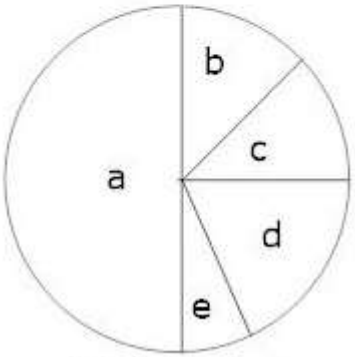
81. .What is the difference between in-situ & ex-situ conservation?

82. .Sometimes introduction of an exotic species upsets native species of the ecosystem. Substantiate the statement with the help of an example?

83. 15.Given below are the representation of global diversity of invertebrates & vertebrates.



Invertebrates



Vertebrates

Mention the class of organism which belongs to each group in this representation.

84. Mention the major causes for loss of biodiversity?

SECTION-B

85. What is Age pyramid? What are the different types of age pyramid?

86. What is Age pyramid? What are the different types of age pyramid?

87. 1.Briefly explain the events of fertilisation and implantation in an adult human female.

2.How does implantation lead to pregnancy?

88. Draw a labelled diagram of an anther lobe at microspore mother cell stage. Mention the roles of different wall layers of anther

89.Why does hnRNA to undergo splicing? Where does splicing occur in the cell?

90. 1.What are the transcriptional products of RNA polymerase-III?

2.Differentiate between ‘capping’ and ‘tailing’.

3. Expand hnRNA.

91. 1.Name the respective forms in which the malarial parasite gains entry into a. human body b. body of female Anopheles

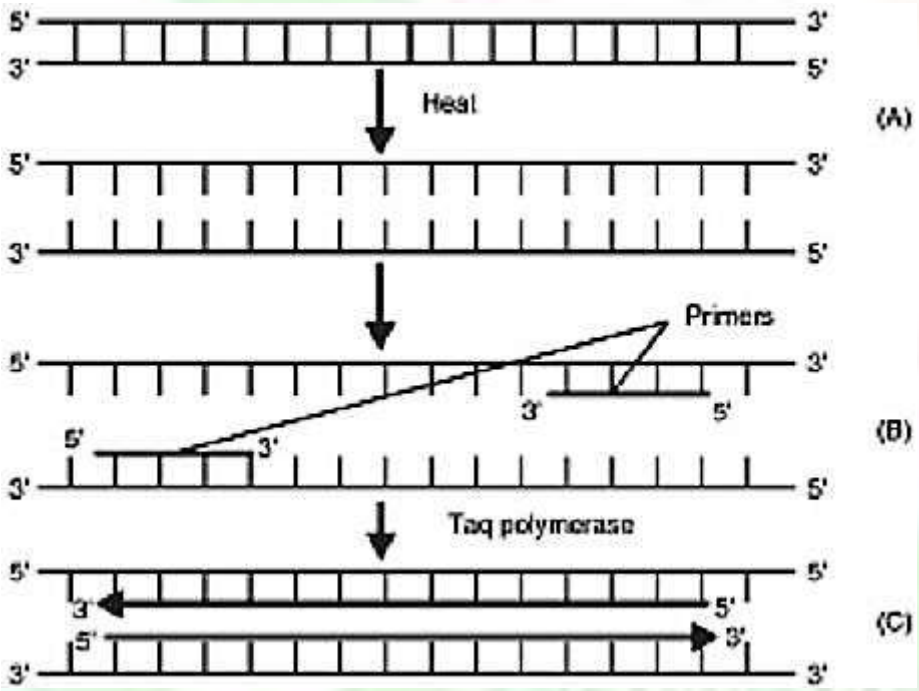
2.Name the hosts where the sexual and asexual reproduction occur, respectively.

3. Name the toxin responsible for the appearance of symptoms of malaria in human. Why do these symptoms occur periodically?

92. 1.Name the category of microbes naturally occurring in sewage and making it less polluted during the treatment.

2.Explain the different steps involved in the secondary treatment of sewage.

93. In the given figure, one cycle of polymerase chain reaction (PCR) is shown-



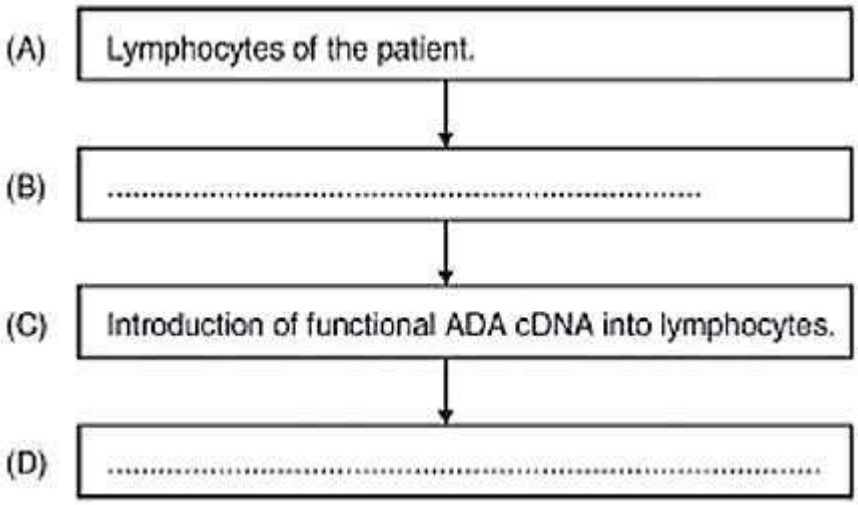
(a) Name the steps A, B and C.

(b) Give the purpose of each of these steps.

(c) State the contribution of bacteriumThermusaquaticus in this process

94. Describe the various steps involved in Recombinant DNA technology with the help of a well labeled. Diagram?

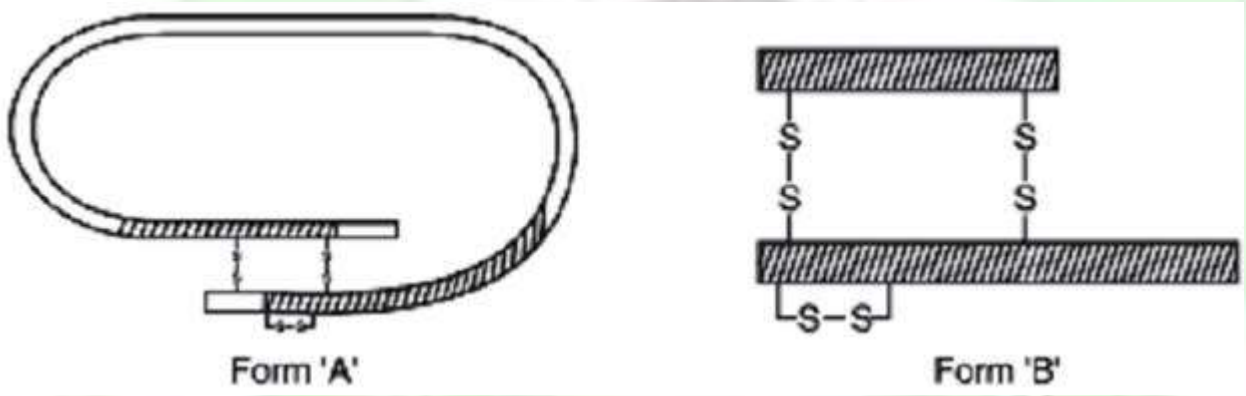
95. The clinical gene therapy is given to a 4 years old patient for an enzyme which is crucial for the immune system to function.



Observe the therapeutical flow chart and give the answer of the following:

(a) Complete the missing steps (B) and (D)
(b) Identify the disease to be cured.
(c) Why the above method is not a complete solution to the problem?
(d) Scientists have developed a method to cure this disease permanently. How?

96. In the given figure, Form (A) and Form (B) represents different forms of a proteinaceous hormone secreted by pancreas in mammals.



(a) What type of bonding is present between chains of this hormone?
(b) What are these form (A) and form (B). How these forms differ from each other?
(c) Explain how was this hormone produced by Eli Lilly, an American company, using rDNA technology.

97. What is Gene therapy – Illustrate using example of Adenosine deaminase deficiency?

98. Explain mutualism with the help of any two examples. How is it different from commensalism?

99. Distinguish between grazing food chain and detritus food chain.

100. a. In which ecosystem the pyrmid of biomass inverted?
b. Why is it inverted? Explain.

c. Name the type of pyramid that is always upright.

Give reasons.

101. Describe at least two approaches each for ex-situ conservation and in situ conservation as a strategy for biodiversity conservation.

102. What is the relation between species richness & area? What is the significance of slope of regression?
