BRAIN INTERNATIONAL SCHOOL
Session 2025-26
PRACTICE PAPER 1
Class XII
Subject – Biology (044)

Instructions:

(i) All questions are compulsory.
(ii) The question paper has five sections and 33 questions. All questions are compulsory.
(iii) Section – A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section – C has 7 questions of 3 marks each; Section – D has 2 case-based questions of 4 marks each; and Section – E has 3 questions of 5 marks each.
(iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
(v) Wherever necessary, neat and properly labeled diagrams should be drawn

Section – A

Question

1. Which of the following supports a dense population of planktons and littoral vegetation.

a) Eutrophic
b) Oligotrophic
c) Agroecotrophic
d) Lithotrophic

2. Condoms are one of the most popular contraceptives because of the following reasons.

a) These are effective barriers for insemination
b) They do not interfere with the coital act
c) All of these
d) These help in reducing the risk of STDs.

3. Conservation within the natural habitat is:

a) Exsitu conservation
b) Insitu conservation
c) Invivo conservation
d) Exvivo conservation

4. Which of the following is an IUCD?

a) Diaphragam
b) Copper-T
c) Oral pills
d) Tubectomy

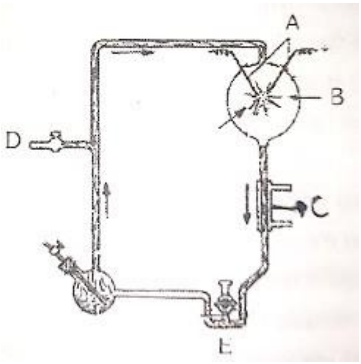
5. Rice is important food grains grown in India for thousands of years. Estimated varieties of rice present in India are:

a) 500,000
b) 100,000
c) 200,000
d) 300,000

6. The excreta of cattle, commonly called gobar is rich in __.
a) Bacillus species
b) Rhizobium
c) Pseudomonas putida
d) Methanobacterium

7. Which of the following do not have similar sex chromosomes? (Homogametic):
a) Bird male
b) Drosophila female
c) Bird female
d) Human female

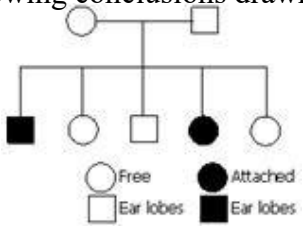
8. The diagram represents miller's experiment. Choose the correct combination of labelling.



a) A-electrodes, B-NH_3 + H_2O, C-hot water,D-tap, E-U trap
b) A-electrodes, B-NH_4 + H_2 + CO_2 +CH_3, C-hot water, D-vacuum, E-U trap
c) A-electrodes, B-NH3 + H2 + H2O +CH2, C-cold water, D-vacuum, E-U trap
d) A-electrodes, B-NH3 + H2 + H2O +CH4, C-steam, D-vacuum, E-U trap

9. Transducers is the term used for:
a) Herbivores
b) Decomposers
c) Green plants
d) Carnivores

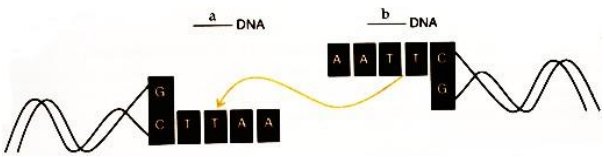
10. Given below is a pedigree chart of a family with five children. It shows the inheritance of attached ear lobes as opposed to the free ones. The squares represent the male individuals and circles the female individuals. Which
one of the following conclusions drawn is correct?



a) The parents are homozygous recessive
b) The parents are heterozygous
c) The trait is Y-linked
d) The parents are homozygous dominant

11. Soil microorganism which converts proteins to ammonia is:
a) Nitrosomonas
b) Pseudomonas
c) None of these
d) Bacillus vulgaris

12. Study the linking of DNA fragments shown below and name the 'a' DNA and 'b' DNA



a) a - Vector DNA, b - Foreign DNA
b) a - Foreign DNA, b - Vector DNA
c) Vector DNA, b - Vector DNA
d) Foreign DNA, b - Foreign DNA

Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true and R is not the correct explanation of A.
c) A is true but R is false.
d) A is False but R is true.

13. **Assertion (A):** Contraceptives are methods to prevent unwanted pregnancies.

Reason (R): Unwanted pregnancies can only be prevented by using oral contraceptives.

14. **Assertion:** Sewage treatment plans allow treated water to accumulate in large tanks.
Reason: Treated water when gets exposed to UV rays of the sun, gradually becomes fit for reuse

15. **Assertion (A):** Ectotherms are able to remain active under cold conditions.

Reason (R): This happens because they are able to maintain a constant internal temperature, even when the temperature outside fluctuates.

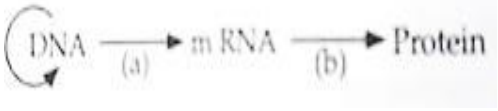
16. **Assertion (A):** Evolution is a continuous process that takes millions of years for speciation.

Reason (R): During evolution, small variation accumulates guided by natural selection that leads to speciation.

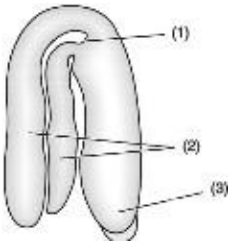
Section B

17. What are genetically modified organisms (GMO)?

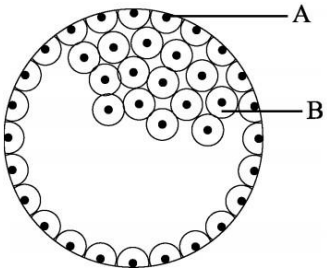
18. The flow of genetic information is shown below. Name the process of (a) and (b).



19. In the given figure of a typical dicot embryo, label the parts (1), (2) and (3). State the function of each of the labeled part.



20. In the given figure, give the name and functions of parts labelled A and B.



21. Why are blue green algae not popular as biofertilisers

OR

Common yeast is known as Baker's yeast and also as Brewer's yeast. Justify

Section C

22. i How many codons codes for amino acids and how many do not?

ii. Explain the following giving one example of each.

a. Unambiguous and specific codon

b. Degeneration codon

c. Universal codon

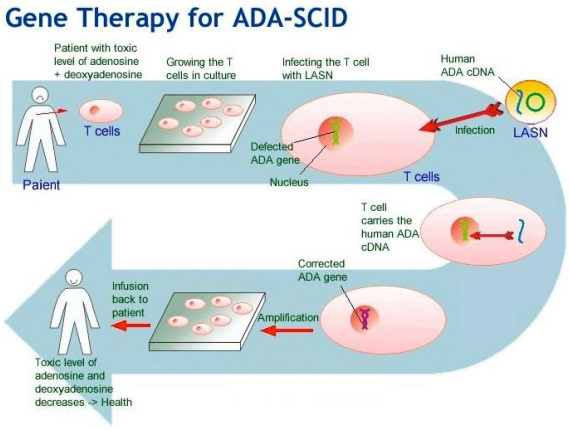
d. Initiator codon

23. A child has blood group O. If the father has blood group B, work out the genotypes of the parents and the possible genotypes of the other offsprings

24. a. What does the equation = rN express in terms of population growth?

b. Write the significance of **r** in a population survey.

25. This image highlights the process of Gene Therapy of ADA-SCID.



i. Mention the cause of ADA deficiency in humans.

ii. How has genetic engineering helped patients suffering from it?

26. Seeing a crowd of students in one corner of the school, the Principal rushed to see the matter and found some children beating and chasing a small monitor lizard. On seeing the Principal, all the children fled to their classes except Alok who requested the Principal to arrange for some medical assistance for the injured animal. The Principal rewarded the student.

a) Was Alok an indisciplined boy who did not run to the class on seeing the Principal? What values does the act promote?

b) How do endangered species differ from vulnerable species?

c) Mention the factors resulting in loss of biodiversity / extinction.

OR

The species diversity of plants (22 percent) is much less than that of animals (72 percent). What could be the explanations to how animals achieved greater diversification?

Section D

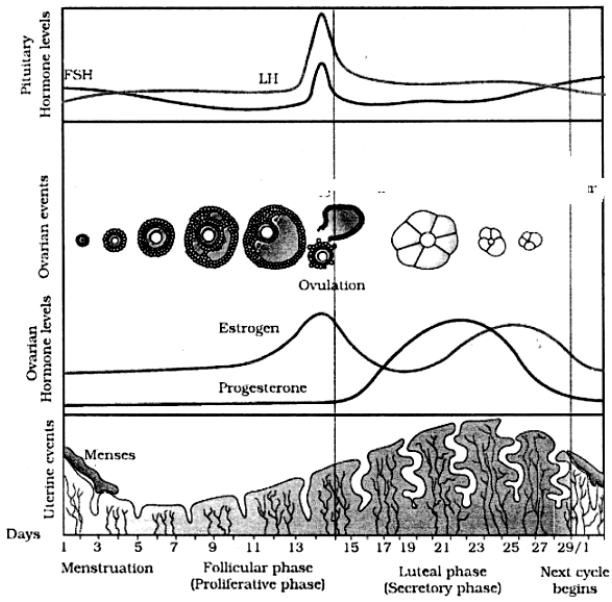
27. What is the study of fossils called? Mention any three points how the fossils throw light on the past.

28. Differentiate between vaccination and immunization. Describe the two types of vaccines with suitable examples?

29. Read the following text carefully and answer the questions that follow:

The reproductive cycle in female primates (e.g. monkeys, apes and human beings) is called the menstrual cycle.

In human females, menstruation is repeated at an average interval of about 28/29 days, and the cycle of events starting from one menstruation till the next one is called the menstrual cycle Anita has show Diagrammatic presentation of various events during a menstrual cycle.



i. What role do pituitary gonadotropins play during the follicular and ovulatory phases of the menstrual cycle? (1)

ii. The first half of the menstrual cycle is called the proliferative phase as well as the follicular phase. Give reason. (1)

iii. Why does corpus luteum stay active throughout pregnancy and in the absence of fertilization, is active only for 10-12 days? (2)

OR

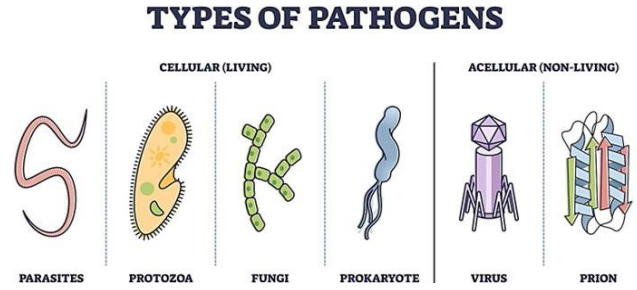
What happens to corpus luteum in human female if the ovum is (2)

a. fertilised,

b. not fertilised?

30. Read the following text carefully and answer the questions that follow:

The pathogen of a disease depends on RBCs of human for growth and reproduction. The person with this pathogen suffers with chill and high fever.



i. Identify the disease.

ii. Name the pathogen.

iii. What is the cause of fever?

OR

Represent the life cycle of the pathogen diagrammatically.

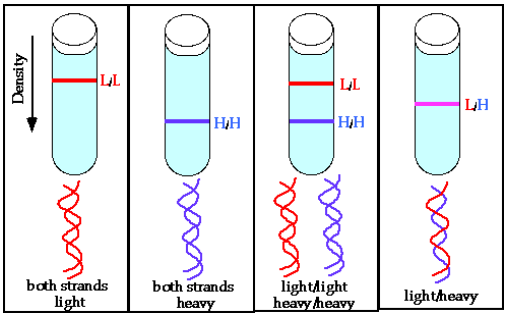
Section E

31. Explain the post pollination events up to double fertilisation, that occur in an angiosperm.

OR

Differentiate between microsporogenesis and megasporogensis. Which type of cell division occurs during these events? Name the structures formed at the end of these two events.

32. Answer the following questions based on Meselson and Stahl's experiment.



i. Write the name of the chemical substance used as a source of nitrogen in the experiment by them.

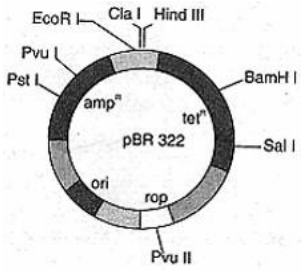
ii. How did the scientists make it possible to distinguish the heavy DNA molecule from the light DNA molecule? Explain.

iii. Write the conclusion the scientists arrived at after completing the experiment.

OR

Explain the mechanism of DNA replication with the help of a replication fork. What role does the enzyme DNA-ligase play in a DNA replication fork?

33. The plasmid pBR322 was one of the first EK2 multipurpose cloning vectors to be designed and constructed (ten years ago) for the efficient cloning and selection of recombinant DNA molecules in Escherichia coli. This 4363-bp DNA molecule has been extensively used as a cloning vehicle because of its simplicity and the availability of its nucleotide sequence. The widespread use of pBR322 has prompted numerous studies into its molecular structure and function. These studies revealed two features that detract from the plasmid's effectiveness as a cloning vector: plasmid instability in the absence of selection and, the lack of a direct selection scheme for recombinant DNA molecules.



i. Name the organism in which the vector shown is inserted to get the copies of the desired gene.

ii. Mention the area labelled in the vector responsible for controlling the copy number of the inserted gene.

iii. Name and explain the role of a selectable marker in the vector shown.

OR

Explain briefly PCR.

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Session 2025-26

PRACTICE PAPER 2
Class XII
Subject – Biology (044)

Instructions:

(i) All questions are compulsory.

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(iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.

(iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

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Section A

Questions

1. Energy transfer from one trophic level to another is:
a) 50%
b) 100%
c) 10%
d) 5%

2. Which of the following is a STD?
a) Pneumonia
b) Malaria
c) Cancer
d) Trichomoniasis

3. Which of the following are also called lungs of our planet?
a) Amazonian rain forests
b) Mediterranean Basin
c) Western Ghats
d) Himalayas

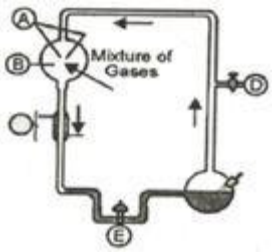
4. Progestin-estradiol combined contraceptive pills inhibit ovulation by:
a) Negative feedback on the release of estrogen from ovary required for follicular development in follicular phase
b) Preventing the uterine physiological and morphological changes required for implantation.
c) Inhibiting the secretion of FSH and LH that are necessary for ovulation
d) Both Negative feedback on the release of estrogen from ovary required for follicular development in follicular phase and Inhibiting the secretion of FSH and LH that are necessary for ovulation.

5. In vitro clonal propagation in plants is characterized by:
a) Electrophoresis and HPLC
b) PCR and RAPD
c) Microscopy
d) Northern blotting

6. Crop rotation is used by farmers to increase:
a) Soil fertility
b) Nitrogenous content of soil
c) Breeding
d) Organic content of soil

7. Select the correct statement:
a) Mendel - Transformation
b) Ribozyme - Nucleic acid
c) T.H. Morgan - Transduction
d) $F_2 \times$ Recessive parent - Dihybird cross

8. The diagram represents the Miller experiment. Choose the correct combination of labelling.

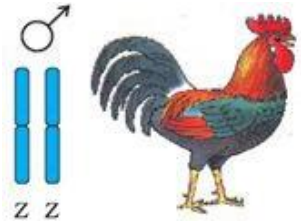


a) A – electrodes, B – $NH_3 + H_2O$, C – hot water, D – tap, E – U trap
b) A – electrodes, B – $NH_3 + H_2 + H_2O + CH_4$, C – steam, D – Vacuum, E – U trap
c) A – electrodes, B – $(NH_3 + H_2 + H_2O + CH_4)$, C – cold water, D – Vacuum, E – U Trap.
d) A – electrodes, B – NH4 + H2 + CO2 + CH3, C – hot water, D – Vacuum, E – U Trap.

9. Pyramid of energy in aquatic ecosystem is:
a) Always upright
b) Bell-shaped
c) Always inverted

d) Both Always upright and Always inverted

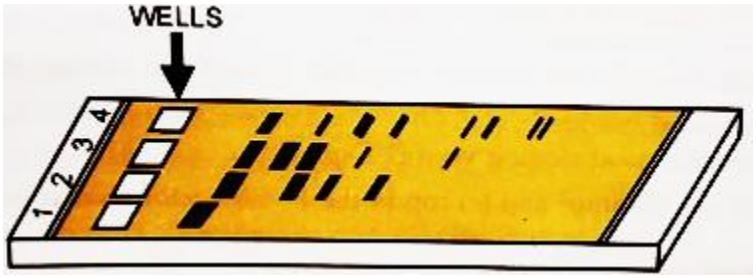
10. On the basis of the sex chromosome shown below, the bird shown is



a) Female
b) Cannot be decided
c) Transgender
d) Male

11. Which of the following organisms not fix atmospheric nitrogen?
a) Oscillatoria
b) Nostoc
c) Spirogyra
d) Anabaena

12. In gel Electrophoresis, DNA bands are separated on the basis of



a) Molecular size
b) Molecular size and Molecular weight
c) Charge
d) Molecular weight

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b) Both A and R are true and R is not the correct explanation of A.
c) A is true but R is false.
d) A is False but R is true.

13. **Assertion (A):** In India, legal abortions are allowed only up to 20 weeks of pregnancy.

Reason (R): This is to avoid sex selective abortions as the sex of the fetus can only be determined after 20 weeks of pregnancy.

14. **Assertion (A):** Dough used for making food such as dosa and idli is fermented by bacterial.
Reason (R): The puffed-up appearance of dough is due to the production of lactic acid.

15. **Assertion (A):** The rate of decomposition is controlled by the chemical composition of detritus.
Reason (R): In a particular climatic condition, decomposition rate is slower if detritus is rich in lignin and chitin, and quicker if detritus is rich in nitrogen and water-soluble substances like sugar.

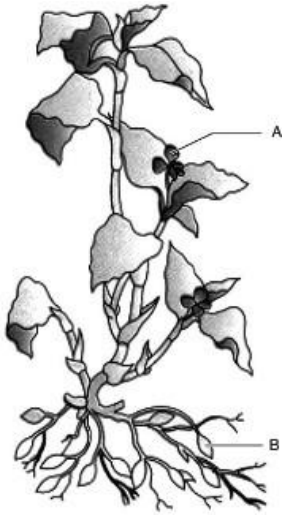
16. **Assertion (A):** Duck-billed Platypus bears mammary glands.
Reason (R): They are mammary-bearing reptiles.

Section B

17. Write any two ways of how genetically modified plants are found to be useful?

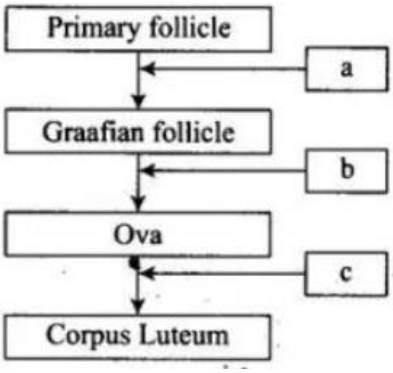
18. Write the RNA strand transcribed from the given transcription unit along with its polarity.

19. Identify the types of flower shown in A and B. Which out of the two will produce an assured seed set.



20. Given below is a flow chart showing ovarian changes during the menstrual cycle. Fill in the

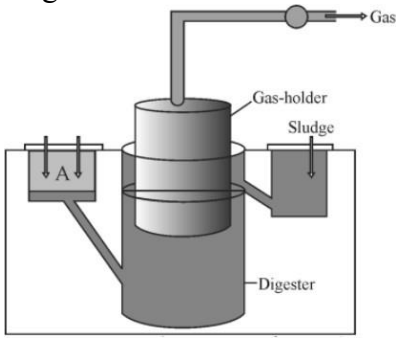
spaces giving the name of the hormones responsible for the events shown.



21. A farmer was advised to use viruses for species-specific, narrow spectrum insecticidal applications. To which genus do these viruses belong and which specific category of pathogens can they be used for?

OR

Study the picture of biogas plant given below and answer the questions that follow:



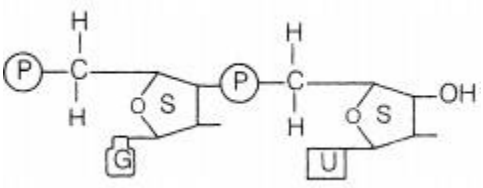
a. Name the components gaining entry from A into the chamber.

b. Mention the group of bacteria and the condition in which they act on the component that entered from A in the digester.

c. Name the components that get collected in gas holder.

Section C

22. Answer the questions based on the dinucleotide show below.



i. Name the type of sugar to which guanine base is attached to.

ii. Name the linkage connecting the two nucleotides.

iii. Identify the 3' end of the dinucleotide. Give a reason for your answer.

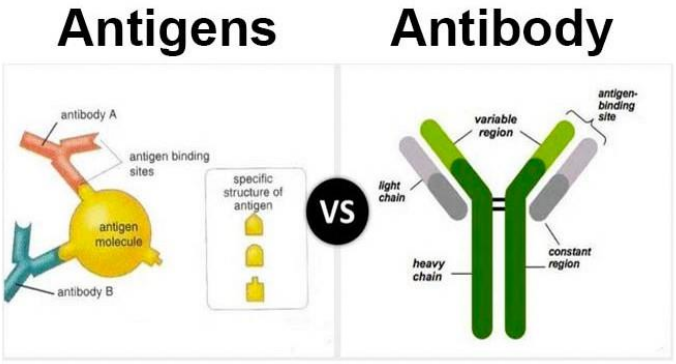
23. Mention any two autosomal genetic disorders with their symptoms.

24. Differentiate between the following inter-specific interactions in a population -

(i) Mutualism and completion.

(ii)Commensalisms and Amensalism.

25. The image here compares Antigens and Antibody.



i. Define the terms Antigen and Antibody.

ii. Name any two diagnostic kits based upon them.

26. A species-area curve is drawn by plotting the number of species against the area. How is it that when a very large area is considered the slope is steeper than that for smaller areas?

OR

a. Enlist two criteria that are used to identify a region for maximum protection as Biodiversity hotspots.

b. Name any two hotspot regions in our country.

27. How would the gene flow or genetic drift affect the population? Do the population in which gene flow and genetic drift are operated obey Hardy Weinberg principle?

28. In your locality, if a person is addicted to alcohol, what kind of behavioural changes do you observe in that person? Suggest measures to overcome the problem.

Section D

29. Read the following text carefully and answer the questions that follow:

Study the given table

	Hormone	Source	Function
A	Oxytocin	W	Ejection of milk
B	X	Anterior lobe of pituitary	Stimulates secretion of ABP from Sertoli cells
C	Y	Placenta	Maintains corpus luteum to secrete progesterone
D	Relaxin	Ovary	Z

i. Identify the hormones X and Y respectively.

ii. Label W and Z.

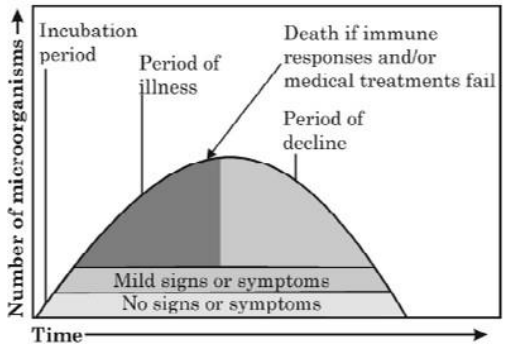
iii. Name the hormones produced only during pregnancy in human female. Mention their source organs.

OR

Name any two hormones which are secreted by placenta and are also present in a non- pregnant woman.

30. Read the following text carefully and answer the questions that follow:

When a microorganism invades a host, a definite sequence of events usually occur leading to infection and disease, causing suffering to the host. This process is called pathogenesis. Once a microorganism overcomes the defense system of the host, development of the disease follows a certain sequence of events as shown in the graph. Study the graph given below for the sequence of events leading to appearance of a disease and answer the questions that follow:



i. In which period, according to the graph there are maximum chances of a person transmitting a disease/infection and why?

ii. Study the graph and write what is an incubation period. Name a sexually transmitted disease that can be easily transmitted during this period. Name the specific type of lymphocytes that are attacked by the pathogen of this disease.

iii. Draw a schematic labelled diagram of an antibody.

OR

In which period, the number of immune cells forming antibodies will be the highest in a person suffering from pneumonia?

Name the immune cells that produce antibodies.

Section E

31. Read the statement and answer the questions that follow.

A flower of brinjal has 520 ovules in its ovary. However, it produces fruit with only 480 viable seeds.

i. What could have prevented the rest of the 40 ovules from maturing into viable seeds? Explain giving a reason.

ii. Describe the development of a dicot embryo in a viable seed.

iii Why certain angiospermic seeds are albuminous, while others are exalbuminous? Explain

OR

Compare the characteristic features of insect pollinated and wind pollinated flowers. Explain how the respective features assist in pollination.

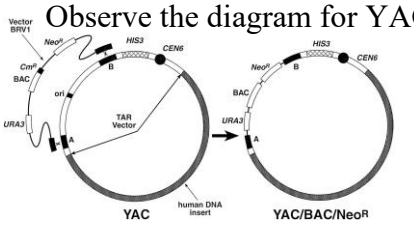
32. a. Describe aminoacylation of tRNA.

b. Explain the process that takes place in the ribosomes when mRNA makes its entry into it in a prokaryote.

c. Due to transcription error, ATG codon of DNA is transcribed into UAG in mRNA which translates a nonfunctional polypeptide chain in the ribosome. Justify the statement.

OR

Observe the diagram for YAC and BAC vector and answer the questions that follow:

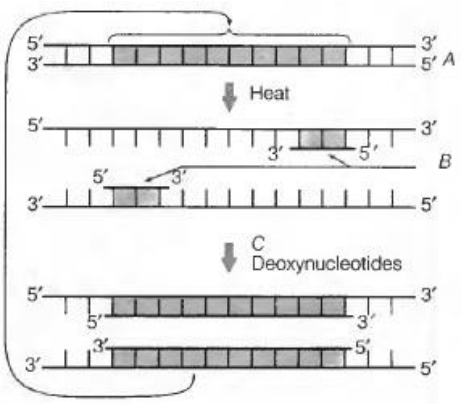


i. What do 'Y' and 'B' stand for in 'YAC' and 'BAC' used in the Human Genome Project (HGP)? Mention their role in the project.

ii. Write the percentage of the total human genome that codes for proteins and the percentage of discovered genes whose functions are known as observed during HGP.

iii. Expand SNPs identified by scientists in HGP.

33. A schematic representation of Polymerase Chain Reaction (PCR) upto the extension stage is given below.



i. Name the process A

ii. Identify B.

iii. Identify C and mention its importance in PCR.

OR

Answer the following questions with respect to recombinant DNA technology:

i. Why is plasmid considered to be an important tool in rDNA technology? From where can plasmids be isolated? (Any two sources)

ii. Explain the role of **ori** and selectable marker in a cloning vector.

iii. r-DNA technology cannot proceed without restriction endonuclease. Justify.