Sample Question Paper
Class XII (2019-20)
Biology (044)

Time allowed: 3 hrs. **Maximum Marks: 70**

General Instructions:

1. There are a total of 27 questions and five sections in the question paper. All questions are compulsory.
2. Section A contains question numbers 1 to 5, multiple choice questions of one mark each.
   Section B contains question numbers 6 to 12, short answer type I questions of two marks each.
   Section C contains question numbers 13 to 21, short answer type II questions of three marks each.
   Section D contains question number 22 to 24, case-based short answer type questions of three marks each.
   Section E contains question numbers 25 to 27, long answer type questions of five marks each.
3. There is no overall choice in the question paper. However, internal choices are provided in two questions of one mark, one question of two marks, two questions of three marks and all three questions of five marks. An examinee is to attempt any one of the questions out of the two given in the question paper with the same question number.

SECTION – A

1. Androgens are synthesized by: 1
   a.) Sertoli Cells
   b.) Leydig cells
   c.) Seminal vesicles
   d.) Bulbourethral gland

OR

A procedure that finds use in testing for genetic disorders, but is also misused for female foeticide is:
   a.) Lactational amenorrhea
   b.) Amniocentesis
   c.) Artificial insemination
   d.) Parturition

2. Which type of immune response is responsible for the rejection of tissues/organs in the patient's body post transplantation? 1
   a.) auto-immune response
   b.) humoral immune response
   c.) physiological immune response
   d.) cell-mediated immune response

OR

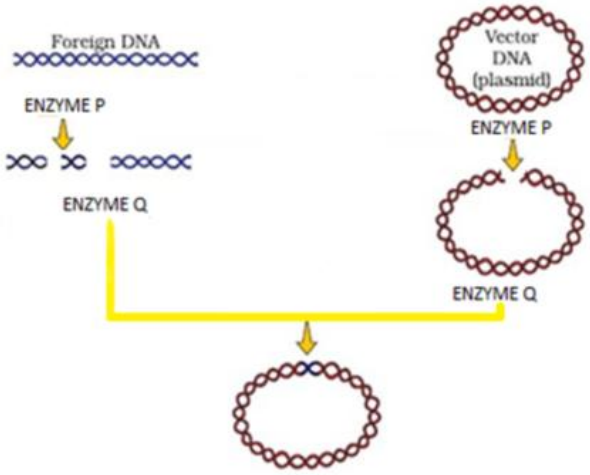
Rheumatoid arthritis is caused when . . .

i.) Lymphocytes become more active
ii.) Body attacks self cells
iii.) More antibodies are produced in the body
iv.) The ability to differentiate pathogens or foreign molecules from self-cells is lost

Choose the correct answer from the options given below:

a.) i and ii
b.) iii and iv
c.) i and iii
d.) ii and iv

3. Name the enzymes 'P' and 'Q' that are involved in the processes given below. 1



a.) Enzyme P-Exonuclease and Enzyme Q-Permease
b.) Enzyme P-Exonuclease and Enzyme Q- Ligase
c.) Enzyme P-Endonuclease and Enzyme Q- Permease
d.) Enzyme P-Restriction endonuclease and Enzyme Q-Ligase

4. A biotechnologist wanted to create a colony of *E.coli* possessing the plasmid pBR322, sensitive to Tetracycline. Which one of the following restriction sites would he use to ligate a foreign DNA? 1

a.) Sal I
b.) Pvu I
c.) EcoRI
d.) Hind III

5. The most important cause of biodiversity loss is: 1

a.) Over exploitation of economic species
b.) Habitat loss and fragmentation
c.) Invasive species
d.) Breakdown of plant-pollinator relationships

SECTION B

6. How does an encysted *Amoeba* reproduce on return of favourable conditions? 2

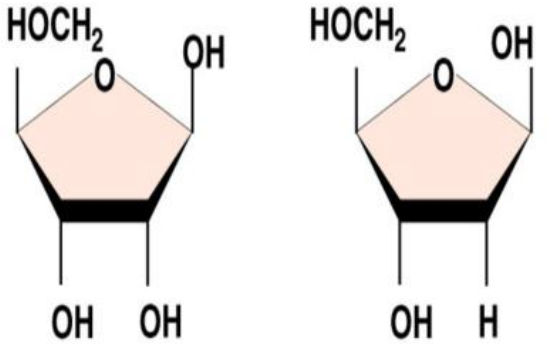
OR

What are gemmules and conidia? Name one organism each in which these are formed?

7. Name any two copper releasing IUD's. State how they act as a contraceptive. 2

8. Why is it not possible to study the pattern of inheritance of traits in human beings, the same way as it is done in pea plant? Name the alternate method employed for such an analysis of human traits. 2

9. Carefully examine structures A and B of pentose sugar given below. Which one of the two is more reactive? Give reasons. 2



A B

10. Name the technology and write the procedure that can help a scientist to recover virus free sugarcane plants from diseased canes for his crop breeding experiments. 2

11. Explain the events that occur in the host cell on introduction of nematode-resistant gene into the tobacco plant by using *Agrobacterium* vectors. 2

12. Construct a pyramid of biomass starting with phytoplankton. Label its three trophic levels. Is the pyramid upright or inverted? Justify your answer. 2

SECTION C

13. Draw a well-labelled diagram of L.S of a pistil of a flower showing the passage of growing of pollen tube up to its destination. 3

14. How does gain or loss of chromosome(s) takes place in humans? Describe one example each of chromosomal disorder along with the symptoms involving an autosome and a sex chromosome. 3

OR

A small stretch of DNA strand that codes for a polypeptide is shown below:
3'--- --- --- --- CAT CAT AGA TGA AAC--- --- --- --- 5'

a.) Which type of mutation could have occurred in each type resulting in the following mistakes during replication of the above original sequence?

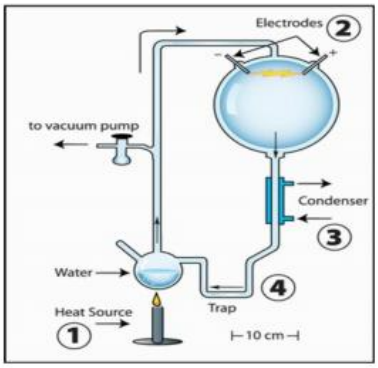
i. 3`… … … …CAT CAT AGA TGA ATC… … …5`

ii. 3`… … … …CAT ATA GAT GAA AC… … … 5`

b.) How many amino acids will be translated from each of the above strands i) and ii)?

15. "Apomixes is a form of asexual reproduction that mimics sexual reproduction in plants". Explain with the help of a suitable example. 3

16. 3



a.) State the hypothesis which S.L. Miller tried to prove in the laboratory with the help of the set up given above.

b.) Name the organic compound observed by him in the liquid water at the end of his experiment.

c.) A scientist simulated a similar set up and added CH_4, NH_3 and water vapour at 800°C. Mention the important component that is missing in his experiment?

17. a.) Study the table given below and identify (i), (ii), (iii) and (iv) 3

Amino acid	**Phe**	**Val**
DNA Code in Gene	AAA	CAC
Codon in mRNA	(i)	(ii)
Anticodon in tRNA	(iii)	(iv)

b.) A polypeptide consists of 14 different amino acids.

i) How many base pairs must be there in the processed mRNA that codes for this polypeptide?

ii) How many different types of tRNA are needed for the synthesis of this polypeptide?

18. How is inbreeding advantageous as well as disadvantageous in cattle breeding programme? (Mention any **two** advantages and **two** disadvantages) 3

19. "Specific Bt Toxin gene is incorporated into cotton plant so as to control infestation of Bollworm". Mention the organism from which the gene was isolated and explain its mode of action. 3

20. State any two criteria for determining biodiversity hotspots. Name any two hotspots designated in India. 3

OR

Differentiate between in-situ and ex-situ approaches for conserving biodiversity. Give an example for each.

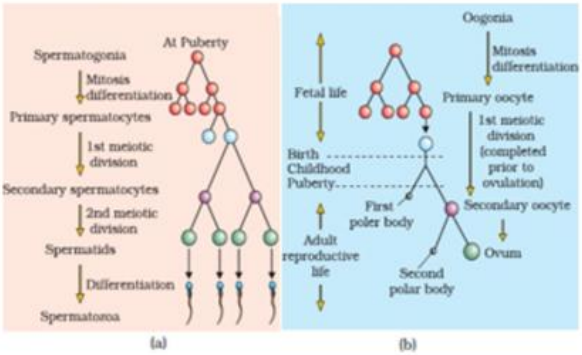
21. When the gene product is required in large amounts, the transformed bacteria with the plasmid inside the bacteria are cultured on a large scale in an industrial fermenter which then synthesizes the desired protein. This product is extracted from the fermenter for commercial use. 3

a.) Why is the used medium drained out from one side while fresh medium is added from the other? Explain.

b.) List any four optimum conditions for achieving the desired product in a bioreactor.

SECTION D

22. 3

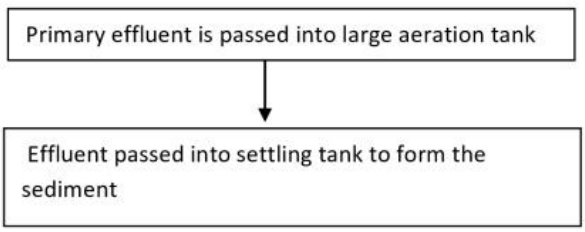


With reference to the above schematic representation of *(a)* Spermatogenesis and *(b)* Oogenesis answer the following questions:

a.) About 300 million spermatozoa may be present in a human male ejaculation at one time. Calculate how many spermatocytes will be involved to produce 300 spermatozoa.

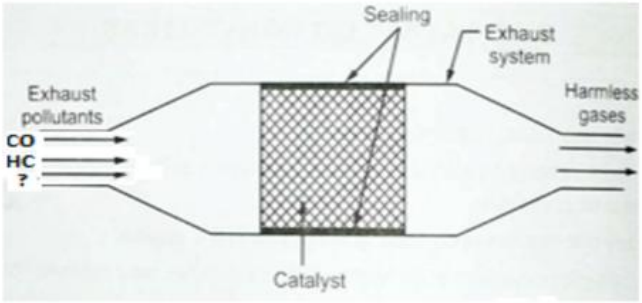
b.) How many chromatids are found during Oogenesis in (i) Primary oocyte and (ii) First polar body in a human female?

23. Large quantities of sewage is generated everyday in cities and towns, which is treated in Sewage Treatment Plants (STPs) to make it less polluted. Given below is the flow diagram of one of the stages of STP. 3
Observe the given flow diagram and answer the questions accordingly.



a.) Why primary effluent is passed into large aeration tanks?
b.) Write the technical term used for the sediment formed? Mention its significance.

c.) Explain the final step that results in the formation of biogas in the large tank before the treated effluent is released into water bodies.

24. 

3

Observe the diagram of the catalytic converter and answer the questions which follow:

a.) Name any two metals used as catalyst in the catalytic converter.

b.) Name the gases that are released after passing the exhaust hydrocarbons through the catalytic converter.

c.) Name the other poisonous gas which is missing *(?)* in the exhaust pollutant of an automobile in the above diagram?

SECTION E

25. Certain phenotypes in human population are spread over a gradient and reflect the contribution of more than two genes. Mention the term used for the type of inheritance? Describe it with the help of an example in human population. 5

OR

Summarize the process by which the sequence of DNA bases in Human Genome Project was determined using the method developed by Frederick Sanger. Name a free living non-pathogenic nematode whose DNA has been completely sequenced.

26. a.) What is mutation breeding? Give an example of a crop and disease to which resistance was induced by this method. 5

b.) Differentiate between pisci-culture and aquaculture.

OR

a.) If a patient is advised anti-retroviral drug, name the possible infection he/ she is likely to be suffering from. Name the causative organism.

b.) How do vaccines prevent subsequent microbial infection by the same pathogen?

c.) How does a cancerous cell differ from a normal cell?

d.) Many microbial pathogens enter the gut of humans along with food. Name the physiological barrier that protects the body from such pathogens.

27. "Indiscriminate human activities have strengthened the greenhouse effect resulting in Global Warming." Give the relative contribution of various Green House Gases in the form of a pie chart and explain the fate of the energy of sunlight reaching the earth's surface contributing towards Global Warming. 5

OR

Given below is a table depicting population interactions between species A and species B.

Type of interaction	Species A	Species B
(a)	(-)	(+)
(b)	(+)	(-)

Name the types of interactions (a) and (b) in the above table.
Justify giving three reason, how the type of interaction (b) is important in an ecological context.

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