



THE DOON GLOBAL SCHOOL

PRE-BOARD-1 (2023-24)

CLASS -XII

SUBJECT-BIOLOGY

CODE-044

TIME - 3 Hr.

M. M- 70

INSTRUCTIONS:

- 1) *All questions are compulsory.*
- 2) *The question paper has five sections and 33 questions.*
- 3) *Section-A has 16 question of One mark each; Section-B is of 5 questions of 2marks each; Section-C has 7 questions of 3 marks each; Section-D is of 2 case based questions of 4 marks each; and section E has 3 questions of five marks each.*
- 3) *There is no overall choice. However internal choice has been provided.*
- 4) *Wherever necessary, neat and properly labelled. diagrams should be drawn*

SECTION-A

- 1) Which of the following is an example of ex situ conservation strategy?
 - a) Biosphere reserves
 - b) Sacred groves
 - c) Hotspots
 - d) Zoological park
- 2) The sticky ends of a fragmented DNA molecules are made up of
 - a) Calcium salts
 - b) Methyl groups
 - c) Unpaired bases
 - d) Endonuclease enzyme
- 3) Rita was doing an experiment on linkage, which of the following cross is suitable for experiment on linkage
 - a) aaBB X aaBB
 - b) AABB X aabb
 - c) AaBb X AaBb
 - d) AAbb X AaBB
- 4) When two similar species live in the same area, they may evolve to become more different in order to
 - a) drive the other species to extinction
 - b) reduce genetic variation
 - c) reduce competition
 - d) use up the other species resources
- 5) Lichens show the symbiotic association between algae and fungi. This kind of interaction exhibited in this case is
 - (a) Parasitism

- (b) Mutualism
- (c) Predation
- (d) Competition

6) Which of the following statements is true about the colostrum -first formed (yellowish) milk from the mammary gland

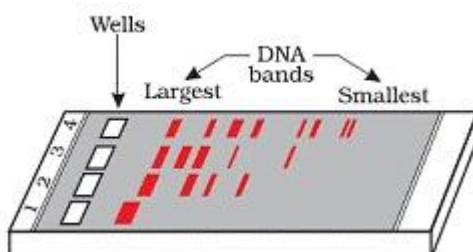
- (A) Colostrum has a high amount of bioactive compounds
- (B) Colostrum help in the activation of a newborn's immune system
- (C) Colostrum contains antibodies to protect the newborn against disease and infections
- (D) All of these

7) Bt toxin gene isolated from a bacterium, is cloned and inserted in plants like cotton, soybean, tobacco to develop resistance to insects. The bacteria is

- (a) Bacillus subtilis
- (b) Bacillus thermusaquaticus
- (c) Bacillus thuringiensis
- (d) Meloidogyne incognita

8) What is the function of filliform apparatus?

- a) guide the entry of pollen yube
- b) recognize the suitable pollen at the stigma
- c) produce nector
- d)stimulates division of generative cell



9) The figure given above shows the set up for typical agarose gel electrophoresis. This experiment is done for the separation and isolation of DNA fragments. Choose the correct observation of DNA fragments and required stain rom the given table

- | Occurrence of DNA bands | stains |
|-------------------------|------------------|
| (a) largest→smallest | safranin |
| (b) smallest→largest | safranin |
| (c) largest→smallest | ethidium bromide |
| (d) smallest→largest | ethidium bromide |

10) The number of chromosomes in females and male honeybees are

- (a) 32
(b) 32 & 16

- (c) 16
(d) 16 & 32

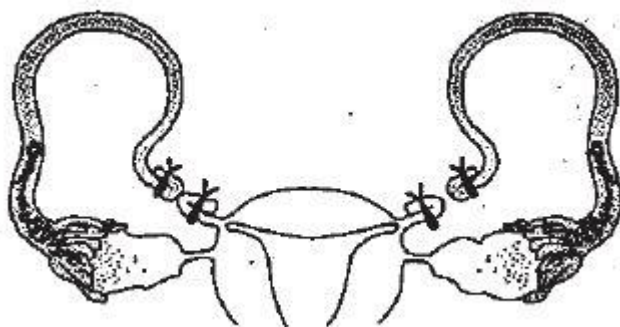
- 11) Which one of the following exhibits least productivity
 a) salty marshes
 b) open oceans
 c) grasslands
 d) coral reefs
- 12) Which of the following nature and charge is correct about histone protein respectively
- | Nature | charge |
|------------|----------|
| (a) basic | negative |
| (b) basic | positive |
| (c) acidic | positive |
| (d) acidic | negative |

Question No 13 to 16 consist of two statements – Assertion (A) and Reason(R). Answer these questions 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) : Diaphragms, cervical caps and vaults are made up of rubber.
 Reason(R) : Diaphragms, cervical caps and vaults are used to cover the male copulatory organ during coitus.
- 14) Assertion (A): Biotechnology produces transgenic microorganisms that function as microfactories for proteins
 Reason(R): Transgenic microorganisms can be developed to produce protein of human use like insulin.
- 15) Assertion (A): Synthesis of daughter or new strand occurs continuously along the parent strand $3' \rightarrow 5'$
 Reason(R): DNA polymerase can polymerize nucleotides in $3' \rightarrow 5'$ direction on $5' \rightarrow 3'$ strand
- 16) Assertion (A): Mycorrhiza is a mutualistic inter-relationship
 Reason(R): Mycorrhiza is an association between fungi and roots of higher plants. .

SECTION-B

- 17) The figure given below is related to the control of pregnancy. Study the figure and answer the questions that follow



- a.) Name the process shown above.
 b.) Explain how this process helps to control pregnancy.

- 18) **In-situ' Conservation can help endangered/threatened species. Justify the statement.**

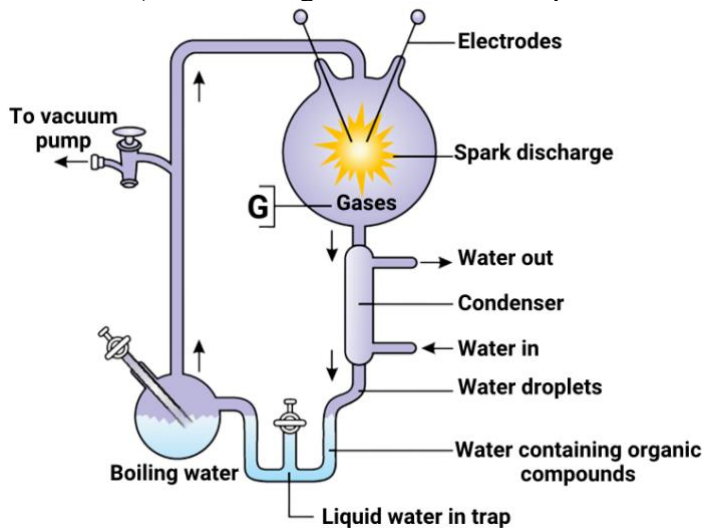
(b) Name and describe any three causes of bio-diversity losses

19) (a) Sickle celled anaemia in humans is a result of point mutation. Explain.

(b) Write the genotypes of both the parents who have produced a sickle celled anaemic offspring.

20) a) In the experiment shown name the gases used in order to stimulate primitive atmosphere.

b) State the significance of the experiment.



21) (a) Name the selectable markers in the cloning vector pBR322? Mention the role they play.

(b) Why is the coding sequence of an enzyme β -galactosidase a preferred selectable marker in comparison to the ones named above?

OR

Draw a labelled sketch of sparged-stirred-tank bioreactor. Write its application.

SECTION-C

22) How did Hershey and Chase differentiate between DNA and protein in their experiment?

23) How are following used in biotechnology:-

- (a) plasmid DNA
- (b) recognition sequence
- (c) thermusaquaticus

24) Unambiguous, universal and degenerate are some of the terms used for the genetic code. Explain the salient features of each one of them. Describe the structure of a nucleosome.

OR

Explain the process of replication of DNA.

25) "Mention the evolutionary significance of the following organisms:

- (a) Shrews
- (b) Lobefins
- (c) Homo habilis
- (d) Homo erectus

26) (a) Explain the events taking place at the time of fertilization of an ovum in a human female.

(b) Trace the development of the zygote up to the implantation in the uterus.

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

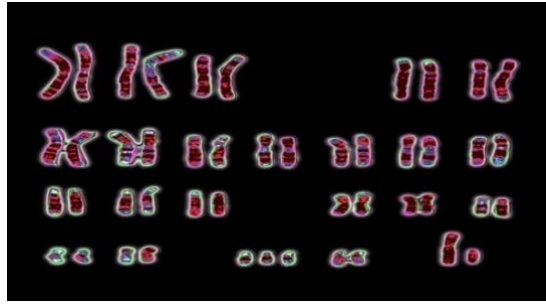
28) State the aim and describe Messelson and Stahl's experiment.

(a) They cultured *E. coli* in a medium containing NH_4Cl for a few generations and centrifuged the content?

(b) What did Meselson and Stahl conclude from this experiment? Explain with the help of diagram.

(c) Which is the first genetic material? Give reasons in support of your answer.

SECTION-D



29)

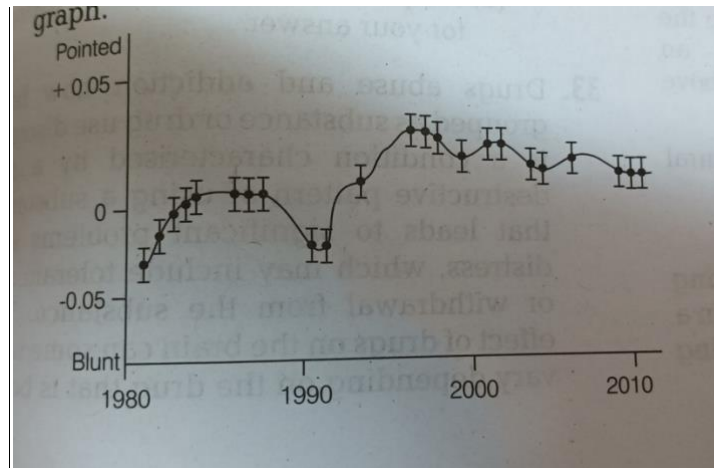
Study the given karyotype and answer the questions that follow

(i) On the basis of given karyotype, name the disorder the person is suffering from

(ii) What type of mutation is there in this syndrome?

(iii) If this syndrome is recognized during birth. What are the physical traits that can be seen?

30) In order to build a longitudinal dataset a record of adult finches *Geospiza fortis* living on one of the Galapagos islands was created. The data collected was associated with the variations in beak shapes of the birds. The records taken between 1981-2020 are shown in the graph.



i) What lead to the diversity in beak shape among the finches?

ii) The graph as a whole does not represent any evolutionary changes in the beak since time interval is too small, where evolutionary progress can take thousands of years to occur. Is the above observation correct? Discuss your opinion on this.

iii) Galapagos finches afford an excellent example of adaptive radiation. Comment.

iv) Homology results in divergence. Elaborate.

SECTION-E

31) (a) How do organisms overcome the temporary short-lived climatic stressful conditions? Explain.

(b) What are the methods of measuring the size of a population in a habitat or an ecosystem.

(c) Explain with the help of an example how the percentage cover is a more meaningful measure of population size than mere numbers.

OR

(a) Why is the introduction of genetically engineered lymphocytes into a ADA deficiency patient not a permanent cure? Suggest a possible permanent cure.

(b) How did an American Company, Eli Lilly use the knowledge of r-DNA technology to produce human insulin?

(c) How is 'Rosie' considered different from a normal cow? Explain.

32). Explain the development of a secondary oocyte (ovum in human female from the embryonic stage upto its ovulation. How do gonadotropins influence this developmental process?

OR

Explain microsporogenesis.

33) Explain the process of menstrual cycle with special reference to hormones involved.

OR

Explain the process of transcription with special reference to differences between eukaryotic and prokaryotic transcription.

