

- Q.32. (a) State the reasons for which Hershey and Chase carried out their experiments.
(b) Answer the following questions based on the experiments of Hershey and Chase :
(i) Name the different radioactive isotopes they used, and explain how they used them.
(ii) Why did they need to agitate and spin their culture ?
(iii) Write their observations and the conclusions they arrived at.

Or

- (a) State the 'Central dogma' as proposed by Francis Crick. Are there any exceptions to it ? Support your answer with a reason and an example.

- (b) Explain how the biochemical characterization (nature) of "Transforming Principle" was determined, which was not defined from Griffith's experiments.
Q.33. (i) Explain monohybrid cross taking seed coat colour as a trait in *Pisum sativum*. Work out the cross up to F_2 -generation.
(ii) State the law of inheritance that can be derived from such a cross.
(iii) How is the phenotypic ratio of F_2 -generation different in a dihybrid cross ?

Or

Thalassemia and Haemophilia are both Mendelian disorders related to blood. Write the symptoms of the disease. Explain with the help of crosses the difference in the inheritance pattern of the two diseases.



SAMPLE QUESTION PAPER - 10

CLASS - 12

BIOLOGY

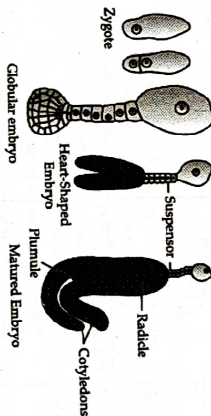
Maximum Marks : 70

Time Allowed : 3 hours

General Instructions : Same as in Sample Question Paper - 1

SECTION - A

- Q.1. Choose the correct labelling for the part X, Y and Z in the given figure of the stages in embryo development of dicot :



Codes

- (a) A - 1, B - 2, C - 3, D - 4
(b) A - 3, B - 2, C - 1, D - 4
(c) A - 4, B - 3, C - 2, D - 1
(d) A - 4, B - 2, C - 3, D - 1

- Q.4. An infertile couple was advised to undergo invitro fertilisation by the doctor. Out of the options given below, select the correct stage for transfer to the fallopian tube for successful results ?
(a) Zygote only
(b) Zygote or early embryo upto 8 blastomeres
(c) Embryos with more than 8 blastomeres
(d) Blastocyst stage

- Q.5. DNA molecule is 160 base pairs long. If it has 20% adenine, how many cytosine bases are present in this DNA molecule ?
(a) 48
(b) 64
(c) 96
(d) 192

- Q.6. Following statements are given regarding MTP. Choose the correct options given below :
(i) MTPs are generally advised during first trimester
(ii) MTPs are used as a contraceptive method
(iii) MTPs are always surgical
(iv) MTPs require the assistance of qualified medical personnel

- Q.7. Interferons are most effective in making non-infected cells resistant against the spread of which of the following diseases in human ?
(a) Ascariasis
(b) Ringworm
(c) Amoebiasis
(d) AIDS

- Q.2. During microsporogenesis, meiosis occurs in
(a) endothecium
(b) microspore mother cells
(c) microspore tetrads
(d) pollen grains

- Q.3. Match the following Column I with Column II and choose the correct option from the codes given below.

Column - I (Vectors)	Column - II (Derivative microorganisms)
A. EcoRI	1. <i>E. coli</i> R 245
B. HindIII	2. <i>Bacillus amylobacteriens</i>
C. BamHI	3. <i>Haemophilus influenzae</i>
D. EcoRII	4. <i>Escherichia coli</i> RY13



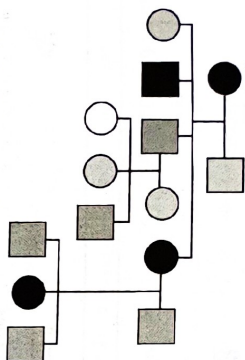
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EVERGREEN 100% SUCCESS IN BIOLOGY - 12

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and identify the type of inheritance along with an example :

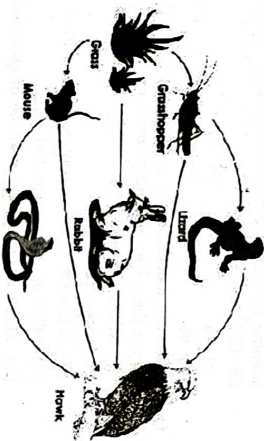


- (a) Autosomal recessive, Sickle-cell anaemia
- (b) Sex-linked dominant, Haemophilia
- (c) Sex-linked dominant, Vitamin D resistant rickets
- (d) Autosomal dominant, Myotonic dystrophy

Q.9. Which one of the following is not a nitrogen-fixing organism ?

- (a) *Anabaena*
- (b) *Nostoc*
- (c) *Azotobacter*
- (d) *Pseudomonas*

Q.10. In the given food web, an increase in the population of hawks will not result in



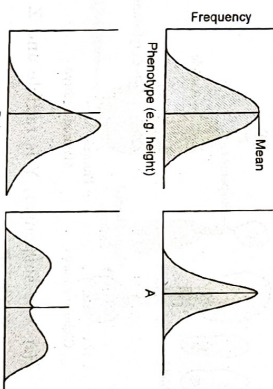
- (a) decrease in the population of lizards
- (b) increase in the population of grasshoppers
- (c) decrease in the population of rabbits and snakes
- (d) decrease in the population of mouse

Q.11. The one-horned rhinoceros shown in the figure specific to which of the following sanctuary ?



- (a) Bhitarkanika
- (b) Bandipur
- (c) Kaziranga
- (d) Corbett park

Q.12. Following is the diagrammatic representation of the operation of natural selection on different traits. Which of the following options correctly identifies all the three graphs A, B and C ?



- (a) Directional Stabilising Disruptive
- (b) Stabilising Directional Disruptive
- (c) Disruptive Stabilising Directional
- (d) Directional Disruptive Stabilising

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.

Q.13. Assertion : Cleistogamous flowers can produce seeds without pollination.

Reason : Cleistogamous flowers have no chance of cross pollination and they are invariably autogamous.

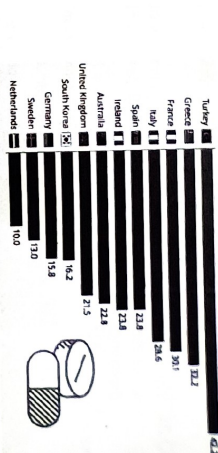
present in middle piece of sperm.

Reason : Numerous mitochondria in the middle piece of sperm produce energy which is required for the movement of sperm.

Q.15. Given below is the graphical representation of the use of antibiotics in various regions of the world. Study the graph below and comment upon the appropriateness of Assertion and Reason.

Assertion : Streptomycin is produced from *Streptomyces griseus*.

Reason : It is given to patients suffering from pneumonia, meningitis and typhoid.



Q.16. Assertion : In most ecosystems, pyramid of biomass is upright.

Reason : The producers are more in biomass than herbivores in an ecosystem.

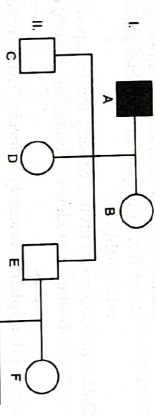
SECTION - B

Q.17. You are conducting artificial hybridisation on papaya and potato. Which one of them would require the step of emasculation and why?

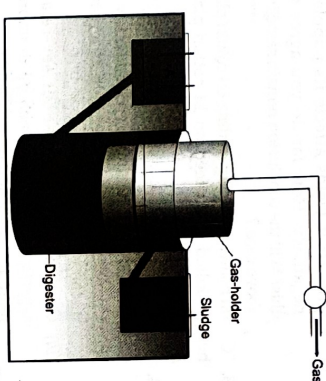
However, for both, you will use the process of bagging. Justify giving one reason.

Q.18. How many types of gametes would be produced if the genotype of a parent is AaBb ?

The diagram below depicts the inheritance of a genetic disorder across a few generations in a family.

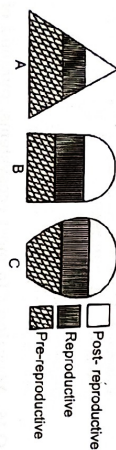


Q.20. Study the picture of biogas plant given below and answer the questions that follows.



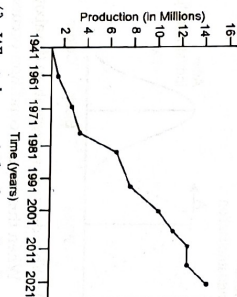
- (i) Name the components gaining entry from A into the chamber.

- (ii) Mention the group of bacteria and the condition in which they act on the component that entered A in the digester.
- Q.21. The following diagrams are the age pyramids of different populations. Comment on the status of these populations.



SECTION - C

- Q.22. The graph shown below represents the production of streptomycin antibiotic, from the year 1944 and onwards till 2021.
- Study the graph given below and answer the following questions.



- (i) What do you infer from the above graph?
- (ii) Which microorganism has been exploited for extracting this valuable antibiotic?
- (iii) Overexploitation of an organism for the product it yields affects its population negatively. How far do you agree with this? Will the conclusion remain same in the above case?
- Q.23. "Cotton bollworms enjoy feeding on cotton plants, but get killed when feed on Bt cotton plant". Justify the statement.
- Q.24. State true/false with explanation.
- (i) Abortions could happen spontaneously too.
- (ii) Complete lactation could help as a natural method of contraception.
- (iii) Creating awareness about sex-related aspects is an effective method to improve reproductive health of the people.

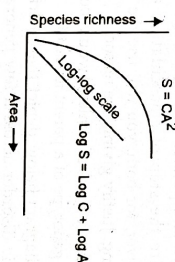
Or

Study the table showing the population interaction between species 'Z' and 'Y' respectively. Assign the appropriate '+'/'-' signs for 'A', 'B', 'D', 'E' and respective interactions for 'C' and 'F'.

Species 'Z'	Species 'Y'	Name of interaction
A	B	Mutualism
D	E	Parasitism
-	0	F

Q.25.

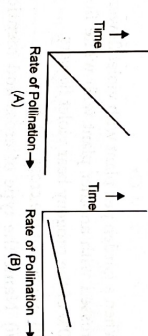
- (i) Write the inference drawn by Alexander von Humboldt after his extensive explorations of South American jungle.
- (ii) Study the graph given below



- As per Alexander von Humboldt, what do the symbols S, A, Z and C in the graph stand for, in respect of a species and area relationship?
- Q.26. (i) Compare, giving reason, the J-shaped and S-shaped models of population growth, of a species.
- (ii) Explain "fitness of a species" as mentioned by Darwin.
- Q.27. A flower of tomato plant following the process of sexual reproduction produces 240 viable seeds. Answer the following questions giving reasons.
- (i) What is the minimum number of pollen grains that must have been involved in the pollination of its pistil?
- (ii) What would have been the minimum number of ovules present in the ovary?
- (iii) How many megaspore mother cells were involved?
- (iv) What is the minimum number of microspore mother cells involved in the above case?
- (v) How many male gametes were involved in this case?

Or

Refer to the two graphs given below. Graph A represents rate of pollination with respect to insect pollinated flowers and graph B represents the same in wind pollinated flowers.

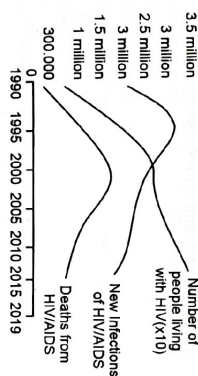


SECTION - D

Question No. 29 and 30 are case-based questions. Each Question has 3 subparts with internal choice in one subpart.

- Q.29. Enzyme *Taq* polymerase, is extracted from a eubacterial microorganism called *Thermus aquaticus* from Yellowstone National Park in Montana, USA and isolated by Chien et al., (1976). *Taq* polymerase successfully replaced the DNA polymerase from *E. coli* that was being used in PCR earlier and this shift revolutionised the PCR technique.

- (i) *Taq* polymerase after its discovery replaced *E. coli*. DNA polymerase in PCR technique. Explain giving reasons why was the need felt for the change?
- (ii) What is a primer and its importance in PCR?
- Or
- Write the basic steps of PCR technique.
- (iii) Write the importance of PCR as a diagnostic tool.
- Q.30. Observe it carefully and answer the questions that follows:



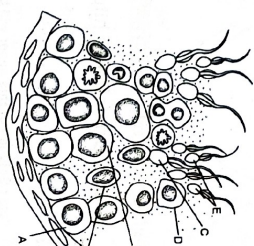
- (i) What do you infer from the above graph?
- (ii) List two ways by which the death from HIV/AIDS can be decreased.
- (iii) Injecting drugs causes a higher risk of HIV compared to consuming drugs in other ways. Comment.
- Or
- Why in successive years (from the above graph) the survival rate has been increased?

SECTION - E

- Q.31. In the following table there are stages of Embryonic development during implantation. Complete the following table w.r.t following stages.

Stage	Time Period	Principal Events
Zygote	-	-
Cleavage	-	-
Morula	-	-
Blastocyst	-	-

Or



Study the given figure.

- Study the above two graphs and answer the questions that follows:
- (i) What do you infer from the two graphs?
- (ii) Give reason as for why the other mode is not an efficient mode of pollination?
- (iii) State two features of wind pollinated flowers.
- Or
- Name any two factors that affect pollination.
- Q.28. Discuss the relationship between detritus food chain and grazing food chain in a terrestrial ecosystem.

SECTION - IV

EVERGREEN MOCK TEST PAPER

CLASS - 12

BIOLOGY (Code No. 044)

Maximum Marks : 70

Time Allowed : 3 hours

General Instructions :

- All questions are compulsory.
- The question paper has five sections and 33 questions. All questions are compulsory.
- 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.
- 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.
- Wherever necessary, neat and properly labelled diagrams should be drawn.

SECTION - A

- Q.32. (i) Pick out and name the cells that undergo spermiogenesis.
(ii) Name 'A' and 'B' cells. What is the difference between them with reference to the number of chromosomes?
(iii) Pick out and name the motile cells.
(iv) What is 'F' cell? Mention its function.
(v) Name the structure of which the given diagram is a part.
- Q.33. (i) State the cause and symptoms of colour blindness in humans.
(ii) Statistical data has shown that 8% of the human males are colour-blind. Explain giving reasons how is it so.
Or
When a garden pea plant with violet flowers was crossed with another plant with white flowers, 50% of the progeny bear violet flowers.
(i) Work out the cross.
(ii) Name the type of cross and mention its significance.
(iii) How does the inheritance pattern of flower colour in snapdragon differ from the above?

Describe the packaging of DNA helix in prokaryotic cell and an eukaryotic nucleus.



Q.1. In a typical complete, bisexual and hypogynous flower, the arrangement of floral whorls on the

thalamus from the outermost to the innermost is :

- Calyx, corolla, androecium and gynoecium
- Calyx, corolla, gynoecium and androecium
- Gynoecium, androecium, corolla and calyx
- Androecium, gynoecium, corolla and calyx

Q.2. During human embryonic development the heart in the embryo is formed after

- 15 days
- 30 days
- 45 days
- 60 days

Q.3. Match the Column I with Column II and select the correct option from the codes given below.

Column I (Time periods in geological time scale)	Column II (Related to)
A. Mesozoic	1. First amphibians
B. Devonian	2. Proliferation of reptiles
C. Palaeocene	3. 160 million years
D. Permian	4. Radiation of primitive mammals

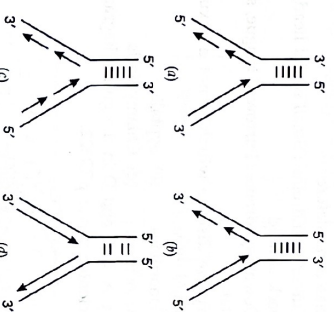
Codes :

- | | | | | | | | |
|-----|---|---|---|-----|---|---|---|
| A | B | C | D | A | B | C | D |
| (a) | 1 | 4 | 3 | (b) | 3 | 1 | 4 |
| (c) | 4 | 1 | 2 | (d) | 2 | 1 | 4 |

Q.4. Clomus form a symbiotic relationship with plant

- leaves
- stem
- root
- stem and root

Q.5. Which one of the following diagram correctly represents DNA replication in eukaryotes ?



Q.6. C-peptide of human insulin is :

- a part of mature insulin molecule.
- responsible for formation of disulphide bridges.
- removed during maturation of pro-insulin to insulin.
- responsible for its biological activity.



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