

APEEJAY SCHOOL PITAMPURA
CLASS: XII BIOLOGY

MM: 70

TIME: 3HOURS

SECTION A

ANSWER THE FOLLOWING IN ABOUT 1-20 WORDS **5X1=5**

- Q.1. In case of an infertile couple, the male partner can inseminate normally but the mobility of sperms is below 40 percent. Judge, which kind of ART(s) is/are suited in this situation to form an embryo in the laboratory, without involving a donor? 1
- Q.2. If the distance between the gene a, b, and c on a chromosome is as follows, prepare a genetic map assigning the correct order of genes. Which of the gene pairs will show maximum frequency of crossing over?
a-b=5cm, b-c=3cm, a-c=2cm 1
- Q.3. Why do RNA viruses undergo mutation and evolution faster than most of the other viruses? 1
- Q.4. Identify two correct statements from the following: 1
- (a) Apiculture means culture of apical meristem.
 - (b) Spinach is iron enriched.
 - (c) Green revolution has resulted in improved pulse – yield
 - (d) Aphids cannot infest rapeseed mustard.
- Q.5. Calculate the length of the DNA of bacteriophage lambda that has 48502 base pairs. 1

SECTION B

ANSWER THE FOLLOWING IN ABOUT 20-30 WORDS **7 x 2=14**

- Q.6. Demand for mushroom as food has led to its culturing on a large scale. Similarly, it is perceived that microbes too would become acceptable as food. Identify any two microbes which can be cultured as a food source and give the applicability of its culture in the given context. 2

OR

- Success rate of artificial insemination in cattle is fairly low. Identify any other mean to improve the successful production of hybrids. State the advantages of this technique.
- Q.7. (a) What role do micropyles play in a mature seed? 2
- (b) What happens to the seed as it gradually matures? 2
- Q.8. Anthropogenic action can hasten evolution. Explain with the help of an example. 2
- Q.9. A person shows a strong immunogenic reaction while exposed to certain substances. Identify the condition. Name the cells responsible for such condition. What precautions should be taken to avoid such conditions? 2

- Q.10. Draw a diagram of an enlarged view of the T.S. of one microsporangium of an angiosperm and label the following parts. 2
- (i) Tapetum
 - (ii) Middlelayer
 - (iii) Endothecium
 - (iv) Microspore mother cells
- Q.11. A DNA segment has a total of 1500 nucleotides, out of which 410 are guanine containing nucleotides. How many pyrimidine bases this DNA segment possesses? 2
- Q.12. Amongst pea tendrils, opuntia spines, lemon thorns and cucurbit tendrils, which one are homologous structures? Why do you call them so? 2

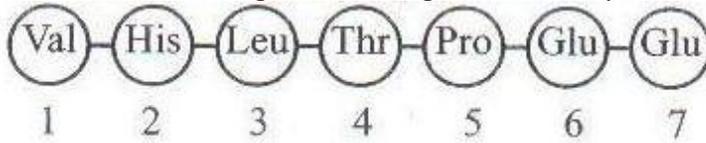
SECTION C

ANSWER THE FOLLOWING IN ABOUT 30-50 WORDS **12X3=36**

- Q.13. (a) What are the ill-effects of use/prolonged use of contraceptive devices? 3
- (b) What are the complications that could happen if STD's are not timely detected? 3
- Q.14. (a) How are the organisms categorized on the basis of the place where syngamy takes place? 3
- (b) How Frog's egg and Lizard's egg different on the basis of development?
- (c) Explain why the young ones produced by Dogs, Cats Etc. have greater chances of survival?
- Q.15. (a) Construct a complete transcription unit with promoter and terminator on the basis of the hypothetical coding strand given below: 3
-
- (b) Write the RNA strand transcribed from the above transcription unit along with its polarity.
- Q.16. Complete the following by filling the spaces by HYV/the quality of the HYV: 3

S.no	Quality	HYV/variety
1.	High yielding and disease resistant in wheat	-----
2.	-----	IR-8
3.	Better yielding semi dwarf variety of rice developed in the year 1966	-----&-----
4.	-----	Pusa Komal (cowpea)
5.	-----	Himgiri (wheat)
6.	High protein content wheat variety	-----

Q.17. The amino acid composition of a portion of the β chain of haemoglobin is shown below: 3



The codon for the sixth amino acid is GAG. The sixth codon GAG mutates to GAA as a result of mutation 'A' and to GUG as a result of mutation 'B'. Haemoglobin structure did not change as a result of mutation 'A' whereas it became sickle shaped as a result of mutation 'B'. Explain giving reasons how is this possible and the effect of such a mutation.

Q.18. a) Write the characteristic features of Flower, pollen and stigma of insect pollinated flowers. 3

b) How do flowers reward their pollinators? Explain

Q.19. How many different types of gametes could result from each of the following genotypes? What will be their genotypes? 3

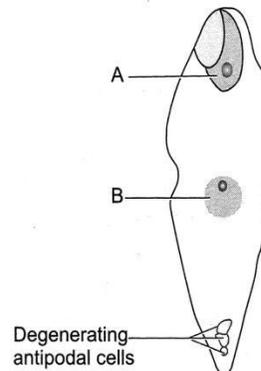
- (a) Aa (b) AABB (c) AaBb (d) EeCc (e) FFIIJj

Q.20. What is meant by each of the following: 3

- (i) Primary follicle
- (ii) Secondary follicle
- (iii) Tertiary follicle

Or

(a) Name the structures of the parts 'A' and B shown in the diagram below respectively develop into



(b) Explain the process of development which 'B' undergoes in albuminous and ex albuminous seeds. Give one example of each of these seeds.

Q.21. Give reasons for the following: 3

- a) Curd is nutritionally better than milk.
- b) Larger holes are observed in Swiss cheese.
- c) Alcoholic content in whisky is more than in beer, although both are made using malted barley and yeast.

Q.22. a) Explain the property that prevents normal cells from becoming cancerous cells?? 3

b) All normal cells have inherent characteristic to become cancerous and they can also be induced to become cancerous. Explain

- Q.23. a) A person was found to be affected by swelling of the lower extremity of the feet and then the swelling had spread upwards mainly due to blockage in lymph vessels and fluid retention in it. Is there any problematic situation. Justify your reasoning. Can it be transmitted? 3
- b) Why psychotropic drugs are available in the medical stores?
- Q.24. i. Draw a pedigree chart of a family consisting of the following members, age given within brackets: - father [70] is normal, mother [65] is a carrier, one son [40] is Normal, second son [37] is affected (sufferer). One daughter (33) is normal (non - Carrier), second daughter (30) is normal (carrier). 3
- ii. If no daughter in the above family could be born as affected for this trait, work out in a punnet square to find out if this trait could be phenylketonuria and conclude by saying yes or no. [You can use the letters 'A' and 'a' for the dominant and recessive allele of this gene respectively].

SECTION D

ANSWER THE FOLLOWING IN ABOUT 80-120 WORDS 3X5=15

- Q.25. a) Name the phenomenon, in which a single gene product produces more than one phenotypic effect. Give an example to it, from plants 5
- b) Give the genotypes, and phenotypic effects, and also mention the one that shows incomplete dominance?
- c) Why was sex chromosomes given the name X-chromosome?

OR

Multiple allelism, polygenic inheritance, polyploidy and polycistronic gene are terms which refer to 'many'.

- i) How does polygenic inheritance differ from multiple allelism? Give examples
- ii) Why is it said that multiple allelism exists only in populations, and not in individual organisms?
- iii) How are polyploids formed?
- iv) What do you mean by polycistronic gene? In which groups of organisms are they found?
- Q.26 a) Differentiate between spermatogenesis and oogenesis, with reference to the following aspects: 5
- i. Number of gametes produced from one gamete mother cell.
 - ii. Completion of the processes.
- b) In which stage of development and how does the embryo get implanted?
- c) How is placenta formed? Name the hormones secreted only by the placenta.

OR

- a) Draw a labeled diagram of the mammalian sperm

- Q.27.
- b) Name the part of the sperm that releases a chemical substance that helps the sperm to enter the ova and the part that assist in the motility of sperm.
 - c) Differentiate between the action of luteinizing hormone in males and females
 - a) Name any two free living nitrogen fixing bacteria.
 - b) What are the advantages that mycorrhizal symbiotic associations provide their partner plants?
 - c) Why nucleo-polyhedro viruses are used as biological control agents in ecologically sensitive areas?

OR

- a) Name two agencies that can provide technical support to develop a biogas plant in villages.
- b) Name the group of organisms and the substrate they act on, to produce biogas
- c) How safe it is to release effluents from the STP's into the natural water bodies after secondary treatment. Explain.