

BHARATIYA VIDYA BHAVANS V.M. PUBLIC SCHOOL
SAMPLE PAPER-2
SUBJECT –BIOLOGY

GENERAL INSTRUCTIONS-

1. There are 26 questions and all are compulsory.
2. The question paper consists of five sections A, B, C, D and E. Section A has 5 questions of 1 mark each, Section B has 5 questions of 2 marks each; Section C has 12 questions of 3 marks each, Section D has 1 question of 4 marks whereas Section E has 3 questions of 5 marks each.
3. There is no overall choice. However an internal choice has been provided in one question of 2 marks, one question of 3 marks and all questions of 5 marks.
4. Whenever necessary, the diagram drawn should be neat and properly labeled.
5. Attempts all parts of a question together. Any part/parts attempted separately will be awarded a zero.

SECTION-A

(To be answered in one word /one sentence)

- Q1.Name the phenomenon and one bird where the female directly develops into a new organism.
- Q2. (a) Expand IUCN .
(b) Which forest is named as the 'Lungs of the planet'?
- Q3. At which end 'capping and 'tailing' of hn RNA occur respectively ?
- Q4 Why is hormone- releasing IUD considered a good contraceptive to space children?
- Q5 How do spines help cactus to survive in the desert? Give two methods.

SECTION-B

(To be answered in approx. 30 to 40 words)

- Q6 What is divergent evolution? Explain taking an example of plants.
- Q7 (a) Give an example of an angiosperm that produce seeds without fertilization. Name the process.
(b) Why is an apple categorized as a false fruit?
- Q8 A person is suffering from Amoebiasis .Mention the pathogene that causes it and one organ of the body that gets affected. Give three symptoms and one mode of its transmission .
- Q9 Why is the introduction of genetically engineered lymphocytes into an ADA deficiency patient not a permanent cure? Explain and suggest a possible permanent cure.

OR

What is meant by RNAi (RNA interference).Explain.

- Q10 (a)State any two measures taken by the Delhi Government that brought marked improvement in air quality by 2005

(b)What is polyblend ? State two points in support of its significance.

SECTION-C

(To be answered in approx. 60 to 70 words)

Q11 (a)From which plant are cannabinoids obtained ? Name any two cannabinoids.Which part of the body is affected by these substances ?

(b)How do cellular barriers and cytokine barriers provide innate immunity in humans?

Q12 A dihybrid heterozygous round yellow seeded garden pea (Pisum sativum)was crossed with a double recessive plant.

(a)What type of cross is this?

(b)Work out the genotype and phenotype of the progeny.

(c) What principle of Mendel is illustrated through the result of this cross?

Q13 What is protoplast? Name the two enzymes used in producing protoplast . Describe the steps in producing somatic hybrids from protoplast .

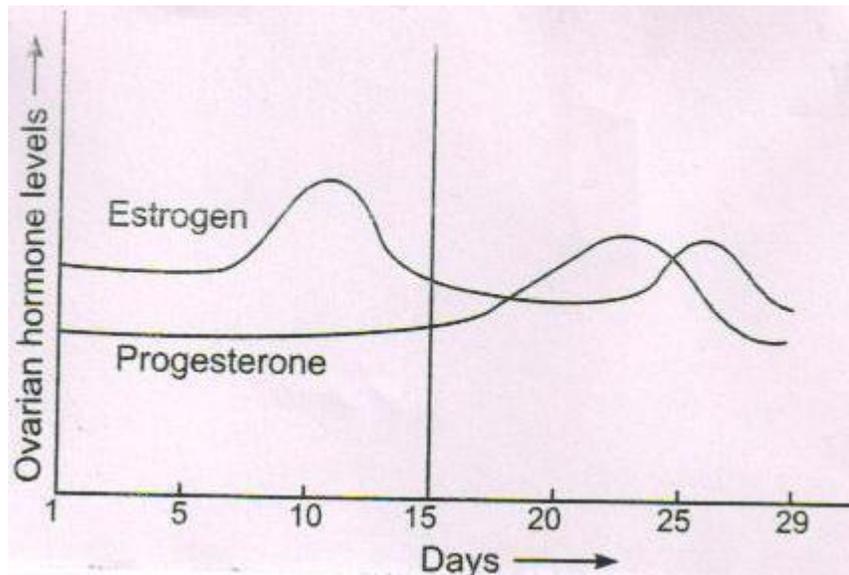
Q14 (a) Why is DNA considered a better hereditary material than RNA ?

(b) Write two chemical differences between DNA and RNA.

Q15 Name the pioneer species on bare rock. How do they help in establishing the next type of vegetation ? Mention the type of climax community that will ultimately get established .

Q16 How do biofertilizers enrich the fertility of soil ? Explain .

Q17 (a) Read the graph given bellow and correlate the uterine events that take place according to hormonal levels on.



- (i) 6 -15 days
- (ii) 16 -25 days
- (iii) 26 -28days (if ovum is not fertilized)

(b) Specify the sources of the hormones mentioned in the graph.

OR

A sperm has just fertilized a human egg in the fallopian tube. Trace the events that the fertilized egg will undergo up to the implantation of the blastocyst in the uterus.

Q18 (a) What is saltation in evolution ?

(b) What does Hardy – Weinberg equation $p^2+2pq + q^2=1$, convey ?

(c) Name the different ways in which natural selection can affect the frequency of a heritable trait in a population .

Q19 (a) Why is 'MOET' considered to be a successful programme in cattle breeding ?

(b) What kind of male and female cattle are selected for this programme ?

(c) Why is the cow administered with FSH-like hormones ?

Q20 What are Cry protein? Name an organism that produce it. How has man exploited this protein to

his benefit ?

Q21 (a) Amniocentesis, for sex determination is banned in our country . Is this ban necessary? Explain.

(b) Where does triple fusion take place in a flowering plant? Why is it so called? Mention its significance.

Q22 (a) What are the types of desirable approaches to conserve biodiversity ? Explain with suitable

example.

(b) Enumerate the defence mechanisms evolved by prey species to lessen the impact of predation with an example for each . (Three points)

SECTION –D

(To be answered in approx. 70 to 90 words)

Q23 Conserving natural resources is the need of hours. Organic farming is one of the way of conserving natural resources as it allows maximum utilization of the resources. Ramesh Chandra Dagar, a farmer in Sonnipat, Haryana is just doing this.

(a) What is meant by integrated organic farming ?

(b) List the different activities that can possibly be included inorganic farming .

(c) Describe how these activities can be integrated .

(d) Indicate the value shown by Mr. Dagar ?

SECTION –E

(To be answered in approx. 100 to 120 words)

Q24 Describe in sequence along with schematic diagram, the formation of an ovum from an oogonium in human female . Also draw well labelled diagram of an ovum .

OR

Describe the process of megasporogenesis in angiosperm, until 8-nucleated stage and draw the labelled structure of matured embryo- sac .

Q25 (a) Who explained the transforming principle? How did the scientist perform the experiment to explain the principle?

(b) How was the biochemical nature of the transforming material determined? Explain.

OR

(a) Describe the process of synthesis of fully functional m-RNA in eukaryotic cell.

(b) How is this process of m-RNA synthesis different from that in prokaryotes?

Q26 The mature insulin is different from pro-insulin secreted by the pancreas. Explain. How was human Insulin produced by using r-DNA technology? Why is this hormone considered better than the ones used earlier by diabetic patient?

OR

(a) With the help of diagram, show the different steps in the formation of recombinant DNA by the action of Restriction Endonuclease enzyme EcoRI.

(b) A vector is engineered with three features which facilitate its cloning within the host cell. List and explain each of them.

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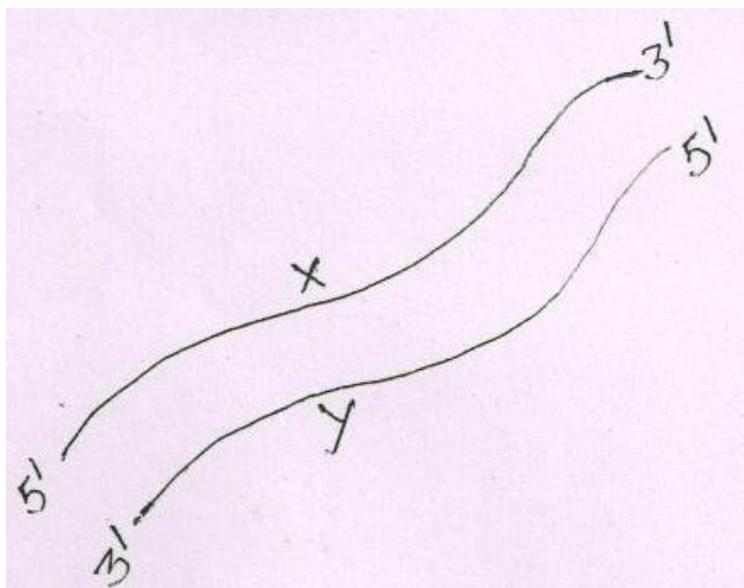
SECTION-A

(To be answered in one word /one sentence)

Q1 Why is a whiptail lizard referred to as parthenogenetic ?

Q2 List two factors that determine the vegetation and soil type of an ecosystem .

Q3 A structural gene has two DNA strands X and Y shown below. Identify template strand.



Q4 a) Expand RTI .

b)What technique would you suggest for correcting infertility caused due to very low sperm counts of a male partners?

Q5. Why do people living in high altitude have more hemoglobin / high RBC count?

SECTION-B

(To be answered in approx. 30 to 40 words)

Q6. Amongst pea tendril, opuntia spines, lemon thorn and cucurbits tendril, which ones are homologous structure? Why do you call them homologous?

Q7. Leistogamous flowers of Commelina are invariably autogamous. Mention its one advantage and one disadvantage.

Q8. What is colostrums? Why is it important to be given to the new born infants?

Q9. How does ds RNA gain entry into eukaryotic cell to cause RNA interference?

OR

Name the source organism from which Ti plasmid is isolated. Explain the use of this plasmid in biotechnology.

Q10 a) Name the most widely used method of removing particulate matters.

b) State the function of catalytic converters in automobiles. Name any two metals used in these converters.

SECTION-C

(To be answered in approx. 60 to 70 words)

Q11 a) State the primary and secondary lymphoid organs in human.

b) Why does a doctor administer tetanus antitoxoid and not a tetanus vaccine to a child injured in a roadside accident with a bleeding wound? Explain.

Q12 a) List the three different allelic forms of gene 'I' in humans. Explain the different phenotypic expression, controlled by these three forms.

b) A woman with blood group 'A' marries a man with blood group 'O'. Discuss the possibility of inheritance of the blood group when they produce children some with 'O' group and some with 'A' group.

Q13. Write the scientific name of the most common species of honey bee reared. Mention the kind of area suitable for bee keeping practices. Give two uses of bee wax.

Q14 a) A t-RNA is charged with amino acid phenylalanine.

- i) At what end of t-RNA is the amino acid attached?
- ii) What is m-RNA codon that codes for phenylalanine?

iii) Name the enzyme responsible for this attachment.

b) Comment upon Phenylketonuria and Thalasemia.

Q15 Why should biological control of pests and pathogens be preferred to the conventional use of chemical pesticides? Explain how the Nucleopolyhedrovirus act as biocontrol agents.

Q16 Explain the different stages involved in the process of decomposition of detritus.

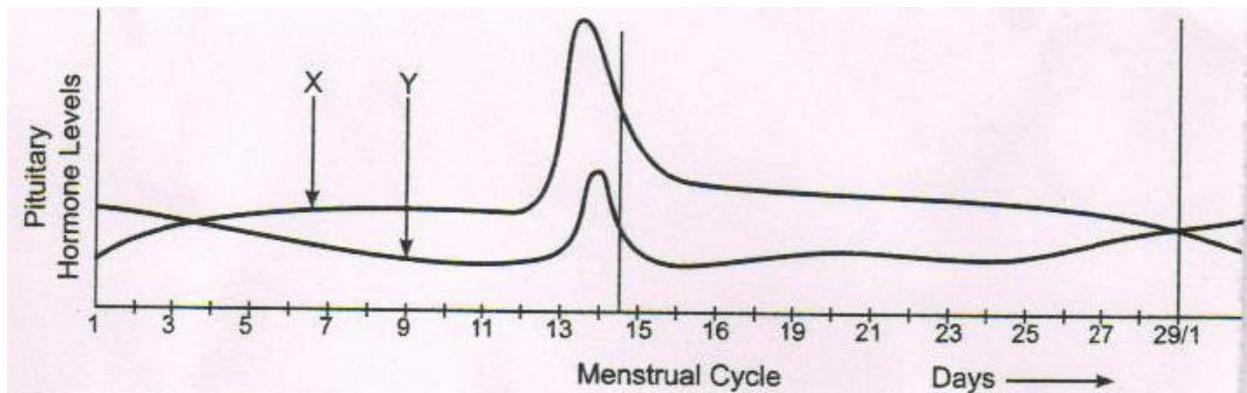
Q17 What is meant by out breeding? Describe the different methods of out breeding in animals

Q18 a) What is founder effect?

b) How is Darwin's concept of evolution different from that of de Vries?

c) Why do sons of a haemophylic father never suffer from this trait?

Q19. Study the graph given below and answer the questions that follow-



a) Name the hormones 'X' and 'Y'.

b) Identify the ovarian phases during a menstrual cycle.

i) 5th day to 12th day of the cycle.

ii) 14th day of the cycle.

c) Explain the ovarian events (i) and (ii) under the influence of hormones X and Y.

OR

When and how does placenta develop in human female? How is it connected to the embryo? It acts as endocrine gland. Explain.

Q20 a) What are three critical research areas of biotechnology?

b) State the principle on which ELISA technique is based. How does it help in early detection of disease?

Q21 a) Why is the process of fertilization in angiosperms termed as double fertilization? Explain.

b) Mention any three characteristics that an ideal contraceptive should have.

Q22 a) How do organisms manage with stressful conditions existing in their habitat for short duration?

- Explain with the help of one example in each.
- b) Alien species are a threat to native species. Justify taking examples of an animal and a plant alien species.

SECTION-D

(To be answered in 70 to 90 words)

- Q23. Mr.Gupta in Australia takes fruits, vegetables, bread eggs and snake curry in a day's menu.
- How many trophic levels does he occupy in different food chain?
 - Represent at least three food chain.
 - Which among them gives him maximum amount of energy? Give reasons.
 - What value do you get from this?

SECTION-E

(To be answered in approx. 100 to 120 words)

- Q24. a) How does microspore mother cell develop into mature pollen grain in angiosperms?
- b) Describe the structure of mature pollen grain and draw a labelled diagram of its two cell stage.

OR

- a) Draw a labelled diagram of female reproductive system of human being.
- b) Write the functions of (i) Endometrium (ii) Fimbriae (iii) Acrosome

- Q25.How did Alfred Hershey and Martha Chase unequivocally prove that DNA is the genetic material?

OR

- a) Explain the process of charging of t-RNA.Why is it essential in translation?
- b) Who proposed the concept of lac-operon? Explain how this operon gets switched 'on' and 'off' along with schematic diagram.

- Q26 a) How is amplification of a gene sample of interest carried out by using PCR.
- b) Comment upon the steps involved in sewage treatment before it can be released into natural water bodies.

OR

- a) Draw a schematic sketch of pBR322 and label the following
- Any two restriction site
 - Ori and rope genes
 - Any antibiotic resistant gene
- b) How can DNA segments separated by gel-electrophoresis be visualized and isolated?