

**NAVODAYA VIDYALAYA SAMITI  
SAMPAL QUESTION PAPER**

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**Class: XII**  
**Time: 3 Hours**

**BIOLOGY (Theory)**  
**Max. Marks: 70**

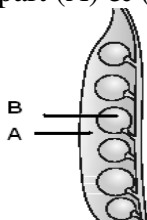
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**GENERAL INSTRUCTION:-**

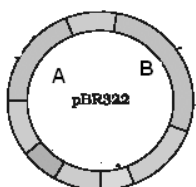
- (i) All question are compulsory.
  - (ii) This question paper consist of four section A, B, C, &D. Section A is of 8 questions of one mark each, section B is of 10 questions of two marks each, section c is of 9 questions of three marks each and section D is of 3 questions of five marks each.
  - (iii) 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 the three questions of 5 marks weightage. A student has to attempt only one of the alternatives in such questions.
  - (iv) Wherever necessary, the diagram drawn should be neat and properly labeled.
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**SECTION-A**

1. Study the figure & label part (A) & (B).



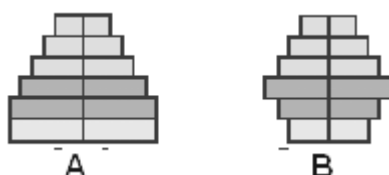
2. Which of the following are analogous organs?
- (a) Fore limb of birds and fore limb of bat.
  - (b) Wing of bird and wing of bat.
  - (c) Wing of bat and the flipper of a whale.
  - (d) Pectoral fin of a fish and the forelimb of a frog.
3. Mention the name of gene (A) & (B) on E.coli cloning vector PBR 322.



4. Which enzyme is known as 'Molecular scissor'?
5. A son has blood group O. What is true of the inheritance of this blood group in his case?
- (a) His mother should be with AB blood group.
  - (b) Both his parents should be heterozygous A group.
  - (c) His father could be homozygous B group.
  - (d) His mother could be homozygous A group.
6. Name the compound used for staining the isolated DNA in the gel.
7. Write the scientific name of the nematode that attacks the root of tobacco plant.
8. Name two diseases that can be treated by producing biological compound in transgenic animals.

## SECTION-B

9.



Observe the representation of age pyramids for human population and mention which one is stable and which is declining out of (A) & (B)

10. Which hormones secreted by placenta? Name the organ, which secretes relaxin.  
 11. What is eutrophication? Explain its consequence on life of plants and animals in such water body.  
 12. What is the role of baculoviruses in the IPM programme?  
 13. Fill in the blank a, b in the following table.

ORGANIC ACID	MICROBE
Butyric acid	-----a----
-----b---	Aspergillus niger (fungus)

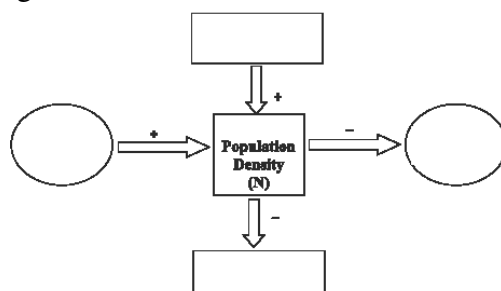
14. Chara is monoecious or dioecious. Name the male and female sex organs.  
 15. What is detritus? What is meant by humification?  
 16. What are chasmogamous flowers and cleistogamous flower? Give examples in which these two flowers produce.  
 17. Who discovered the technique of DNA fingerprinting? Expand VNTR.  
 18. From which protein is the exine of pollen grain formed. What is the function of tapetum?

**OR**

What is the function of nectary and PEN?

## SECTION-C

19. "A population has been exhibiting genetic equilibrium".  
 Answer the following questions with regard to the above statements.  
 (a) Name the underlying principle.  
 (b) Take up any one such factor and explain how the gene pool will change due to that factor.  
 (c) Name two factors, which affect the genetic equilibrium of the population.  
 20. (a) By which method DNA separates out and removes from test tube.  
 (b) Name the technique by which the fragment of DNA is separated.  
 (c) What is elution?  
 21. Which cyanobacteria is used as a biofertiliser in a rice field. In which way is it useful? Name two examples.  
 22. Complete the following chart and name the factors, which decrease the N in given area.



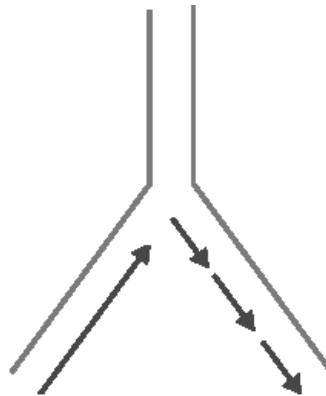
23. (a) what is insecticidal protein? Write mode of action of insecticidal protein.

24. Fill in the blank a, b, c, d, e and f in the following table.

ORGANISM	DISEASE
-----a--	Typhoid
Pneumonia	-----b---
-----c---	Ring worms
-----d----	Ascariasis
Wuchereria bancrofti	-----e-----
Entamoeba histolytica	-----f-----

25. Write central dogma of protein synthesis. How many initiation codons present in genetic code? Give three termination codons in protein synthesis.

26.



- (a) Mention the polarity of continuous and discontinuous strands.
- (b) Which enzyme joined discontinuously synthesized fragment in replication.
- (c) In which phase of cell division replication of takes place. What is its significance?

27. Mendel's cross homozygous tall with homozygous dwarf and proposed two general rules to consolidate his understanding of inheritance explains two rules on monohybrid cross.

OR

Night blindness and colour blindness usually seen in human males? Can human female also develop this disorder? Explain it

#### **SECTION-D**

28. (A) what is the number of chromosomes in the following cells of a human male?

- (a) Sertoli cells
- (b) Spermatogonial cells.

(B) Mention the function of Leydig cells.

(C) Draw diagrams of T.S of testis and explain the process of spermatogenesis.

OR

(A) Why are date palm plant referred to as dioecious?

(B) Name an organism in which isogamy occurs.

(C) Why are offspring of oviparous animals at a greater risk as compared to offspring of viviparous animals?

(D) Why both tapeworm and earthworm is hermaphrodite's animal?

29. (A) Name the chemical extracted from *Cannabis sativa*.

(B) What is the function of opioids give one example of opioids?

- (C) Barbiturates, LSD used on which types illnesses.
- (D) Which drug is used as effective sedative and painkiller and is very useful in patients who have undergone surgery.

**OR**

- (A) Name the plant from which Cocaine is obtained.
  - (B) What is Withdrawal syndrome?
  - (C) Mention the function of Nicotine. Name the plant in which nicotine present.
  - (D) Name the drugs, which is used by sport person to increase muscle power.
30. (A) Write down the seven pair of contrasting character selected by Mendel in pea.
- (B) Why Mendel selected *Pisum sativum* for his experiment?
  - (C) What happens when a red-colored homozygous 4 O' clock plant is crossed with a heterozygous 4 O' clock plant? Work out all the genotype and phenotypes.

OR

- (A) Name the positively charged proteins in nucleoid.
- (B) Who proposed the double helix model of DNA?
- (C) How many nucleotides present in bacteriophage lambda.
- (D) Explain the structure of double- helix model of DNA.

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**NAVODAYA VIDYALAYA SAMITI  
SAMPLE QUESTION PAPER**

**BLUE PRINT- (BIOLOGY)  
CLASS-XII**

**TIME: 3 HOURS**

**MAX. MARKS: 70**

<b>Sr.No</b>	<b>Types of Questions Topics</b>	<b>VSA III (1 Marks)</b>	<b>SA II (2 Marks)</b>	<b>SA I (3 Marks)</b>	<b>LA (5 Marks)</b>	<b>TOTAL</b>
<b>1</b>	Sexual Reproduction	1(1)	8(4)	-	5(1)	<b>14(6)</b>
<b>2</b>	Genetics & Evolution	2(2)	2(1)	9(3)	5(1)	<b>18(7)</b>
<b>3</b>	Biology & Human Welfare	1(1)	2(1)	6(2)	5(1)	<b>14(5)</b>
<b>4</b>	Biotechnology & its applications	2(2)	2(1)	6(2)	-	<b>10(5)</b>
<b>5</b>	Ecology & Environment	2(2)	6(3)	6(2)	-	<b>14(7)</b>
<b>TOTAL</b>		<b>8(8)</b>	<b>20(10)</b>	<b>27(9)</b>	<b>15(3)</b>	<b>70(30)</b>

## NAVODAYA VIDYALAYA SAMITI

### MARKING SCHEME SAMPLE QUESTION - BIOLOGY

#### SECTION-A

- A1. (A) Pericarp  $\frac{1}{2}$   
(B) Seed  $\frac{1}{2}$  [1 Mark]
- A2. (b) Wing of bird and wing of bat. [1 Mark]
- A3. A- ampR  $\frac{1}{2}$   
B- tet R  $\frac{1}{2}$  [1 Mark]
- A4. Restriction endonucleases. [1 Mark]
- A5. (b) Both his parents should be heterozygous A group. [1 Mark]
- A6. Ethidium bromide. [1 Mark]
- A7. Meloidogyne incognita. [1 Mark]
- A8. Cystic fibrosis, Rheumatoid arthritis, Alzheimers disease. [1 Mark]

#### SECTION-B

- A9. (A) Stable = 1  
(B) Declining =1 [2 Mark]
- A10. Human chorionic gonadotropin, human placental lactogen estrogen progesterone.=1  
Ovary =1 [2 Mark]
- A11. Definition of eutrofication. =1  
Consequence: - (a) Increased nutrient content of the water body causes bloom.  
(b) It covers the water surface toxins and reduces the dissolved oxygen content of water.  
(c) Oxygen deficiency may be a cause for death of animals.  
(Any two  $\frac{1}{2}$  each) [2 Mark]
- A12. – Baculo viruses are species-specific and narrow spectrum insecticides.  
\_ They have no negative impacts on plants. Birds, Mammals or even other non-target insects.  
\_ The desirable aspect is conservation of beneficial insect in an overall integrated pest management programme as in an ecologically sensitive area.(any two 1 each) [2 Mark]
- A13. (a) Clostridium butylicum =1  
(b) Citric acid =1 [2 Mark]
- A14. Monoecious =1  
A-Oogonium  $\frac{1}{2}$   
B – Antheridium  $\frac{1}{2}$  [2 Mark]
- A15. \_ Detritus refers to the dead remains of plant and animals and also the faecal matter of animals.
- A16. \_ chasmogamous flowers, which are similar to flowers of other species with, exposed anthers and stigma.  
\_ Cleistogamous flowers that do not open at all. In such flowers the anthers and stigma lie close to each other.
- A17. \_ Alec Jeffreys =1  
- Variable Number Tandem Repeats (VNTR) =1 [2 Mark]
- A18. – Sporopollinin =1

- Provide nourishment. =1 [2 Mark]

**OR**

Nucellus- Provide nutrition, PEN- Formation of endosperm

**SECTION -C**

- A19. (a) Hardy- Weinberg principal. =1  
(b) Any one factor =1  
(c) Mutation, gene flow genetic drift, natural selection (any two) =1 [3 Mark]
- A20. (a) Spooling =1  
(b) Gel electrophoresis =1  
(c) The separated bands of DNA are cut out from the agarose gel and extracted from the gel piece. =1 [3 Mark]
- A21. Anabaena, Nostoc, oscillateria =1  
They trap atmospheric nitrogen and supply to the developing plants. =1  
Rhizobium bacteria. =1 [3 Mark]
- A22. Immigration (I), Emigration (E), Natality (B), Mortality (D). [3 Mark]
- A23. (a) B. Thuringiensis forms protein crystals during a particular phase of their growth. These crystals contain a toxin, which kill insect. =1.  
(b) Bt toxin protein exist as inactive protoxins but once an insect ingest the inactive toxin, it is converted into an active form of toxin due to the alkaline pH of the gut which solubilise the crystals. The activated toxin binds to the surface of midgut epithelial cells and create pores that cause cell swelling and lysis and eventually cause death of the insect. =2 [3 Mark]
- A24. a – Salmonella typhi ½  
b – Streptococcus pneumoniae ½  
c – Trichophyton and epidermophyton. ½  
d – Ascaris lumbricoidis ½  
e - elephantiasis or filariasis ½  
f – amoebiasis ½ [3 Mark]
- A25. Central dogma –  
Transcription translation  
DNA----->mRNA----->Protein =1  
  
- AUG =1  
- UAA, UAG, UGA. =1 [3 Mark]
- A26. (a) 3'-----5' – continuous.  
5'-----3' – discontinuous. =1  
(b) DNA ligase = 1  
(c) S- phase – Leads to evolution and multicellularity [3 Marks]
- A27. Explanation of Law of Dominance with example =1  
Explanation of Law of segregation with example =2 [3 Marks]

**OR**

- \_ The gene Night blindness and colour blindness are present on the x-chromosome.
- \_ A male has one x-chromosome and the y-chromosome has no corresponding alleles for these genes and hence male are pure for the character.

\_A female has two x-chromosome, received and one from each of the parents and she has to be homozygous for the defective alleles to express the character.  
[3 Marks]

**SECTION – D**

- A28. (A) (a) 46 chromosome  $\frac{1}{2}$  (b) 46 chromosome  $\frac{1}{2}$   
(B) Testosterone responsible for secondary sexual characters. =1  
(C) Diagram with three label 1  $\frac{1}{2}$   
Explanation 1  $\frac{1}{2}$  [5 Marks]

**OR**

- (a) Bear exclusively either male flower or female flower. =1  
(b) Monocystis or any one example =1  
(c) Oviparous offspring- (1) vulnerable to predators  
(2) Exposed to the harsh environment outside  
Viviparous offspring- protected and nourished by the parent organism =2.  
(d) Both sexes are present. =1 [5 Marks]

- A29. (A) Cannabinoids =1  
(B) Bind to specific opioid receptors present in our central nervous system and gastrointestinal tract. =1  
Example- opium poppy =1  
(C) Mental illnesses like depression and insomnia. =1  
(D) Morphine =1 [5 Marks]

**OR**

- (A) *Erythroxylum coca* =1  
(B) If regular dose of drug/alcohol is abruptly discontinued patient show symptoms like anxiety, shakiness, nausea and sweating.=1  
(C) Nicotine stimulates adrenal gland to release adrenaline and nor adrenaline into blood circulation, both of which raise blood pressure and increase heart rate =1  
Tobacco =1  
(D) Cannabinoids

- A30. (A) Seven pair of contrasting characters =1  
(B) Bisexual, Many contrasting character, easy to hybridized etc =1  
(C) Incomplete Dominance=1  
Genotype. =1  
Phenotype =1 [5 Marks]

**OR**

- (A) Histones =1  
(B) Watson and Francis Crick. =1  
(C) 48502 base pair=1  
(D) Explanation =2 [5 Marks]

