NAVODAYA VIDYALAYA SAMITI

CLASS: XII BIOLOGY (044) PRE BOARD II (2021-22)

Max. Marks 35 Time allowed: 2 hours

General Instructions:

- i) All questions are compulsory.
- ii) The question paper has three sections and 13 questions. All questions are compulsory.
- iii) Section—A has 6 questions of 2 marks each; Section—B has 6 questions of 3 marks each; and Section—C has a case-based question of 5 marks.
- iv) 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.
- v) Wherever necessary, neat and properly labeled diagrams should be drawn.

MARKING SCHEME

Q.No	VALUE POINTS	MARKS
1	Antitoxin / Antivenoms / Preformed antibodies = 1/2	2
	- Whenever quick immune response is required we need to directly inject	
	preformed antibodies / Antitoxins = $\frac{1}{2} + \frac{1}{2}$	
	- passive immunity is provided = ½	
2	Immunosuppressive agent- cyclosporine A- ½+1/2	2
	Fungus- <i>Trichoderma polysporum</i> – ½+ ½	
	OR	
	Biological control- bacteria /Bacillus thuringenesis (Bt), available in sachets	
	as dried spores+ water spray	
3	Cannabinoids- 1,	2
	Cannabis sativa, cardivasuclar system= ½+1/2	
4.	(a) Statin -Monscus purpureus (b) Citric acid- Aspergillus niger	½ X4 =2
	(c) Penicillin- Penicillium notatum (d) Butyric acid- Clostridium	
	butylicum	
5	(a) (i) Expanding population (Triangular) (ii) Stable population (Bell shaped)	½ X 4
	(iii) Declining population (Cube shaped)	=2
	(b) We take stable population pyramid as ideal because our aim is to	
	stabilize the population.	
6	(i) a - Unlimited food and space. b - Limited food and space.	2
	(ii) Curve a	
	OR	
	Internal fat oxidation (b)low atmospheric oxygen body compensate by	
	increasing RBC, decresing the binding affinity of haemoglobin	

7	(a) grow rapidly/invade/damage the normal cells/compete for vital nutrients/show metastaisis,	2+1
	(b) biopsy/histopathology/x ray CT scan/MRI	
	OR	
	(a) Elephantiasis/filariasis (b) Chronic inflammation/lymphatic vessels/lewer limbs	
	(b) Chronic inflammation/lymphatic vessels/lower limbs	
8	(a) B and T lymphocytes	1X3=3
	(b) B – lymphocytes	
0	(c) T -lymphocytes	1/37.6
9	Cell break by cellulose and pectinase enzyme.	½ X 6
	Free from other macro molecules by RNA- RNAase, Proteins- Protease,	=3
	Lipids- Lipase,	
	precipitate by chilled ethanol, cutting by using restriction endonucleases,	
10	separation by electrophoresis (a) Nile perch introduced in Lake Victoria eventually led to the extinction of	3
10	an ecologically unique assemblage of more than 200 species of cichild	3
	fish/ Parthenium/Lantana/water hyacinth caused environmental damage	
	and threat to our native species /African catfish-Clarias gariepinus	
	introduced for aquaculture purposes is posing a threat to the indigenous	
	catfishes in our rivers. (Any 2) (2 mark)	
	(b) rate of extinction 100 to 1000 times fasteer than pre human time/ due to	
	human activities (1)	
11	(a) (1) a is $S = CA2$ (b) is $\log S = \log C + Z \log A$	1
	(b) Slope Z (regression coefficient). Its normal values ranges from 0.6 to 1.2	1
	(c) In frugivorous $Z = 1$.	1
12	(a) The mechanism involved is called insertional inactivation, the	1
	phenomenon in which the enzyme becomes inactivated when a	
	recombinant DNA is inserted with in the coding sequence of that	
	enzyme	
	Steps in process : A recombinant DNA is inserted into the DNA	¹ / ₂ +1/2
	sequence coding for the enzyme galacto sidase, it results in the	
	inactivation of the enzyme. In case of the recombinants, when the	
	plasmid has an insert, there is no blue colour produced in the	
	presence of a chromogenic substrate in the medium. In the case of	
	nonrecombinants/non- tranforments i.e. when the plasmid has no	
	insert, a blue colour is produced in the presence of a chromogenic	
	substrate in the medium. (b) Advantage: Simultaneous plating method is quite cumbersome as it	1
		1
13	requires two plates where as this method is simple and easy. (a)ethidium bromide	$1 \times 5 = 5$
13	(b)PCR/remain active during high temperature	$\begin{bmatrix} 1 & \lambda & J - J \end{bmatrix}$
	(c) 5'-GAATTC-3'	
	3;- CTTAAG-5'	
	(d) DNA ligase	
	(e)multiply its numbers equal to plasmid	
	1 × × · · · · · · · · · · · · · · · · ·	l .

Or

a. Farm Land II. (½ mark)

Bt crop. (½ mark) Because the use of pesticides is highly reduced for Bt crop // Decrease of pesticide used is also more significant for Bt crop. (1 mark) b. In Bt cotton a cry gene has been introduce from bacterium *Bacillus thuringiensis* (Bt) which causes synthesis of a toxic protein. This protein becomes active in the alkaline gut of bollworm feeding on cotton, punching holes in the lining causing death of the insect. (2 marks)

However; a Non Bt crop will have no effect on the cotton bollworm/ the yield of cotton will decrease / non Bt will succumb to pest attack. (1 mark)