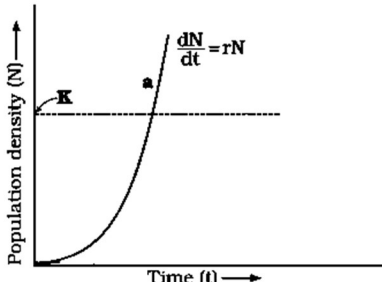


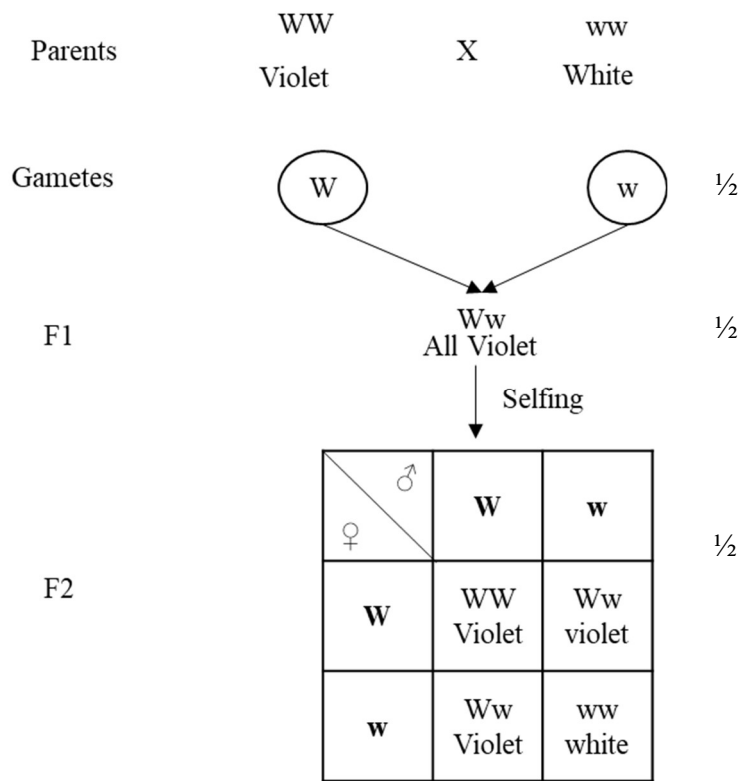
SOLUTIONS
Biology (Subject Code-044)
(PAPER CODE : 57/5/3) (26-05-44N)

Q. No.	EXPECTED OUTCOMES/VALUE POINTS	Marks	Total
	SECTION – A		
1.	(B) / oxytocin, maternal pituitary	1	1
2.	(C) / A-i, B-iii, C-ii	1	1
3.	(D) / 100%	1	1
4.	(C) / (ii), (iii), (i)	1	1
5.	(D) / Sex - linked recessive	1	1
6.	(B) / 64	1	1
7.	(D) / Rhinovirus	1	1
8.	(B) / Directional	1	1
9.	(C) / Removed during maturation of pro-insulin to insulin	1	1
10.	(D) / 5' C-T-G-C-A G 3' 3' G A-C-G-T-C 5'	1	1
11.	(C) / Nile perch	1	1
12.	(C) / Plant produces poisonous chemical, cardiac glycosides.	1	1
13.	(B) / Both Assertion (A) & Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A)	1	1
14.	(C) / Assertion (A) is true but Reason (R) is false.	1	1
15.	(A) / Both Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of Assertion (A)	1	1
16.	(B) / Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A)	1	1
SECTION-B			
17.	Immature lymphocytes differentiate into antigen sensitive T-lymphocytes. • T-lymphocytes / T-cells – They help B-cells to secrete antibodies – They involved in cell mediated immunity / CMI	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2
18.	(a) – Moth deposits its eggs in the locule of the ovary, during this the <i>Yucca</i> flower gets pollinated by the moth.	$\frac{1}{2} \times 2$	

[illegible]

25.	– Normal physiology and development: to study how genes are regulated / how genes affect normal body function and its development / study of complex factors involved in growth such as insulin-like growth factor. – Study of disease: to study how genes contribute to the development of a disease / model animals help us to study many diseases such as cancer or cystic fibrosis or rheumatoid arthritis or Alzheimer's / help us to investigate new treatment methods. – Biological products: To produce specific biological products / medicines / Medicines required to treat certain human diseases / produce human protein α-1-antitrypsin (which treat emphysema) / treatment of phenylketonuria / medicine required for the treatment of cystic fibrosis / produce human protein (alpha lactalbumin) rich milk by Rosie cow (it is nutritionally more balanced for human babies) – Vaccine safety: transgenic mice being developed for use in testing safety of vaccines before they are used on humans / Transgenic mice are being used to test the safety of the polio vaccine / after testing on transgenic animals is successful and found reliable they could replace use of monkeys to test the safety of batches of vaccine. – Chemical safety testing: Transgenic animals are made to carry genes which make them more sensitive to toxic substances than non-transgenic animals. They are then exposed to the toxic substances and the effects studied. (Any three with correct explanation)	1 x 3	3
26.	– Genetic diversity - It refers to the high diversity of a species at the genetic level over its distributional range, e.g. India has more than 50,000 genetically different strains of rice / The genetic variation shown by the medicinal plant <i>Rauwolfia vomitoria</i> growing in different Himalayan ranges might be in terms of the potency and concentration of the active chemical (reserpine) that the plant produces / India has about 1000 varieties of mango / any other correct example. – Species diversity - Diversity at species level / the number of different species in a given region, e.g. Western Ghats have a greater amphibian species diversity than Eastern Ghats / any other correct example. – Ecological diversity - Diversity at the ecosystem level / presence of different types of ecosystems in a particular area, e.g. India has a number of ecosystems like rain forests, coral reefs, deserts / any other correct example.	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	3
27.	(a) <i>Psilophyton</i> (b) Seed ferns (c) Chlorophyte ancestors (d) Ferns, Conifers, Seed ferns (e) Tracheophyte ancestors (f) Chlorophyte ancestors	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	3
28.	(a) Exponential growth pattern (b) 'r' represents the intrinsic rate of natural increase (c) J – shaped curve/	1 $\frac{1}{2}$ $\frac{1}{2}$	

	 (d) The resources will be unlimited	1	3
	SECTION-D		
29.	(a) Because RNA polymerase carries out polymerisation in 5' → 3' direction only. (b) (i) Since hnRNA contains both exons or coding sequence and introns or non coding sequence undergo splicing to remove the introns or non-coding sequence / for the removal of introns. OR (b) (ii). - Capping / addition of mG_{ppp} (Methyl Guanosine Triphosphate) at 5' of hnRNA. - Tailing / Adenylate residue (200-300) are added at the 3' end in a template strand as poly A tail. (c) - If a segment of DNA produces two polypeptides the genetic information machinery becomes complicated / two different polypeptides will be formed and one of which may not be useful for the cell. The two complementary RNA molecules produced simultaneously will form a double-stranded RNA that will not be translated into polypeptides.	1 1 $\frac{1}{2}$ $\frac{1}{2}$ 1 1	4
30.	(a) Plasmids and bacteriophages have the ability to replicate / They multiply within the bacterial cells independently of the chromosomal DNA / an alien piece of DNA can be ligated to them / They can be multiplied equal to their specific copy numbers. (b)(i) (I) ori (II) Pvu II OR (b) (ii) G : amp^R / ampicillin-resistance gene, H : tet^R / tetracycline-resistance gene. (c) Pst I, Pvu I, BamH I, Sal I	1 $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} \times 4$	4
	SECTION-E		
31.	(a) • In Pea plants:		



1/2 x 5

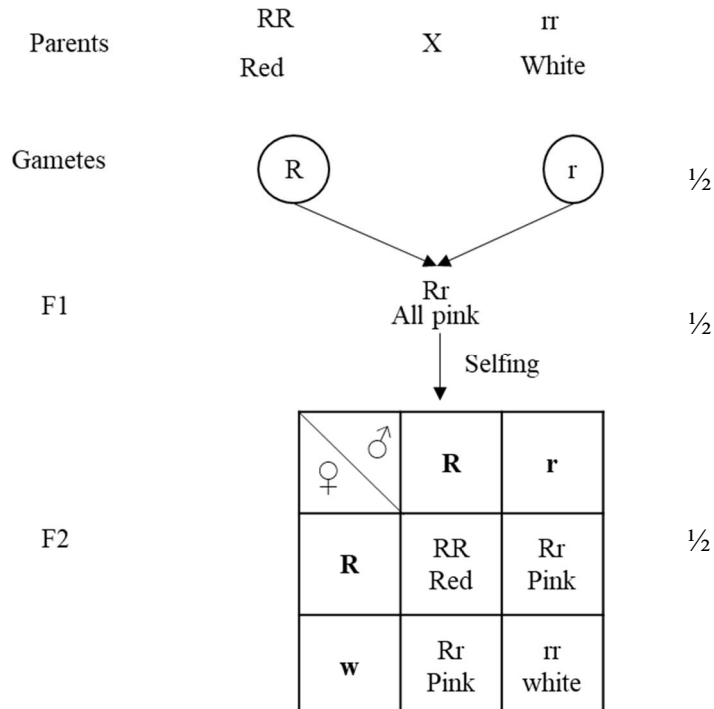
Phenotypic ratio:- violet : white = 3 : 1

(1/2)

Conclusion: This is the case of dominance

(1/2)

• **In *Antirrhinum* plant**



1/2 x 5

Phenotypic ratio:- Red : Pink : white = 1 : 2 : 1

(1/2)

Conclusion: This is a case of incomplete dominance

(1/2)

OR

(b) (i)

•

Mendelian disorder	Chromosomal disorder
– Occurs due to mutation / alteration in single gene / follow mendelian inheritance pattern	– Occurs due to addition or deletion of one or more chromosomes / Does not follow mendelian inheritance pattern

•

Example of mendelian disorder: Haemophilia / Cystic Fibrosis / Sickle Cell Anaemia / Colour Blindness / Phenylketonuria / Thalassemia / any other correct example.

Example of chromosomal disorder: Turner's syndrome / Down's syndrome / Klinefelter's syndrome / any other correct example.

(ii)

- Aneuploidy / Monosomy
- Turner's syndrome
- Symptoms:
 - lack of secondary sexual characters.
 - ovaries are rudimentary
 - sterile
 - short stature
 - underdeveloped feminine characters (any three)

Karyotype – 44+XO (45)

1

$\frac{1}{2}$

$\frac{1}{2}$

$\frac{1}{2}$

$\frac{1}{2}$

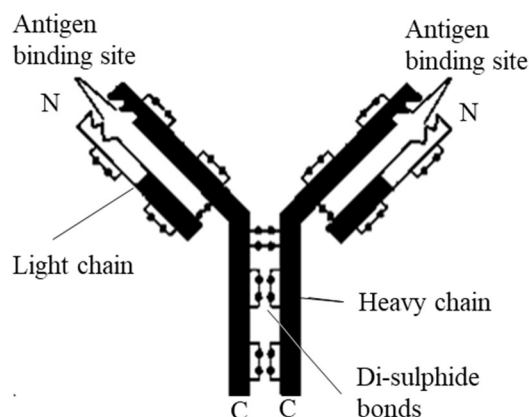
$\frac{1}{2} \times 3$

5

$\frac{1}{2}$

32.

(a) (i)



(Any four labellings)

$\frac{1}{2} \times 4$

(ii)

Active Immunity	Passive Immunity
– When antibodies are produced in our body in response to an antigen then it is called active immunity	– When preformed antibodies (readymade) are injected into the body for protection then it is called passive immunity.

1 x 3

	Function: It supports foetal growth, metabolic changes in mother and maintenance of pregnancy. – Relaxin: Source: Ovary. Function: It facilitates parturition.	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	5
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