

SECTION-A

1.	(A)/ antipodal, zygote and endosperm
2.	(C)/ Ovum -A, Morula - E, Blastocyst - G
3.	(C)/ A - III, B - I, C - IV, D - II
4.	(C)/ Autosomal recessive
5.	(A)/ Chromosome – 1
6.	(A)/ A – connective, B – Endothecium, C – Pollen grain
7.	(A)/ Aneuploidy
8.	(D)/ P – Transcription, Q – mRNA, R – Translation
9.	(D)/ Hugo de Vries
10.	(B)/ A - III, B - IV, C - II, D - I
11.	(D)/ Restriction Enzymes
12.	(B)/ Antigen- Antibody interaction
13.	(A)/ Both Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of Assertion (A).
14.	(C)/ (A) is true, but (R) is false.
15.	(A)/ Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
16.	(B)/ Both Assertion (A) and Reason (R) are true and Reason (R) is not correct explanation of Assertion (A).

SECTION - B

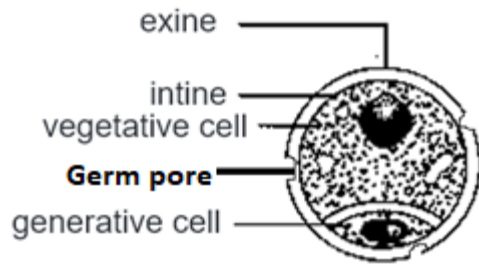
17.	• X- In woman X thickness of uterine wall increases after mid of menstrual cycle, Reason- due to fertilization of egg/pregnancy/conceived • Y- In woman Y thickness of uterine wall decreases after mid of menstrual cycle, Reason- egg has not been fertilized/leading to the breakdown of lining of the uterus/menstrual flow/ bleeding.
18	(a) No ovulation therefore menstrual cycle does not occur during the period / due to lactational amenorrhea. (b) As majority of MTP's are performed illegally by quack which are not safe/to prevent female foeticide.
19.	(a) Insulin was earlier extracted from pancreas of slaughtered cattle or pigs (animals), This Insulin from an animal source may develop allergy or other types of reactions in human body to foreign proteins.

western Ghats, The Himalayas, Indo – Burma region

(Any two)

SECTION - C

22.



XII _ 044 57/4/1 Bi

[Vegetative cell, generative cell, exine, intine, germ pore]

(Any four labeling to be considered)

Vegetative cell- contain abundant food reserve for pollen germination

Generative cell- Divide to produce male gametes

Exine – Protective layer

Intine- Involved in the formation of pollen tube.

Germ pore- Pollen tube emerges from this point.

[Marks to be given to two correct labeling with their respective correct function only]

23.

(a)

- Father genotype - $I^A i$

Parents- $I^A i$ X $I^A I^B$

♀ \ ♂	I^A	I^B
I^A	$I^A I^A$ (A blood group)	$I^A I^B$ (AB blood group)
i	$I^A i$ (A blood group)	$I^B i$ (B blood group)

- Possible genotype- $I^A I^A$, $I^A i$, $I^B i$, $I^A I^B$,

- Possible blood group- A, AB, B

(b)

It is controlled by gene 'I' having 3 alleles (I^A I^B i), The blood group is determined by the type of sugar polymer present on the plasma membrane of the RBC.

24.

(a)

A – Modern human being

B – Baby chimpanzee

C – Adult chimpanzee

- Skull of baby chimpanzee is more like adult human skull (A and B)

(b) (i) *Dryopithecus*

(ii) *Ramapithecus*

25.

(a)

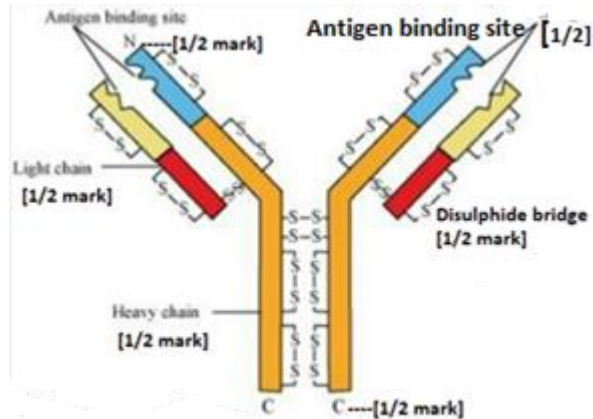
(i) Cannabinoids

(ii) Inhalation, Oral ingestion

(iii) Brain/Heart (cardiovascular system)

OR

(b)



[Four labeling – Antigen binding site, Light chain, Heavy chain, C-terminal, N terminal, Disulphide bridge - ½ mark each]

- They are chemically Proteins
- B- lymphocytes/B- cells

26.

(a)

These consume the major part of organic matter in the effluent, and significantly reduce the BOD.

(b)

Anaerobic sludge digestors where anaerobic digestion of sludge takes place, producing 'Biogas' in the process.

27.

(a)

A- Denaturation , D- Extension

(b)

B- Primers

(c)

C- Taq polymerase , Source- *Thermus aquaticus*

(d) Use- Detection of AIDS/Cancer/ Genetic disorder/ Amplification of mutated gene/ Early diagnosis of disease
[Any one]

28.

(a)

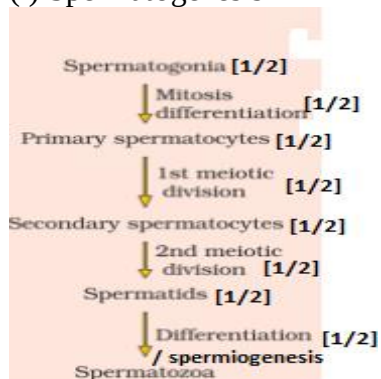
	Production of Biological products- Human protein α-1 antitrypsin used to treat emphysema produced by transgenic organism / Transgenic cow 'Rosie' produce human protein enriched in α- lactalbumin (b) Studying Diseases- Transgenic models of human diseases like cystic fibrosis, cancer etc. are designed to increase our understanding of how genes contribute to development of disease. (c) Chemical safety testing- Transgenic animals are made that carry genes which make them more sensitive to toxic substance. They are then exposed to toxic substance and the effect studied.
	SECTION - D
29.	(a) • A- exponential growth curve/ J-shaped curve • B- Logistic growth curve/ S- shaped curve/ sigmoid curve (b) • It represents carrying capacity (K) • Maximum possible number of individuals beyond which no growth of population is observed. OR (b) Growth curve B is formed when resources (food and space) in nature are limited have environmental checks while growth curve A is formed when resources are unlimited with no environmental checks. (c) (i) • 'B'/ Logistic growth curve • As resources are never infinite in nature. (ii) • J-shaped curve/ exponential growth • It is a continuous growing population.
30.	(a) • hnRNA/ heterogeneous nuclear RNA • RNA polymerase II (b) hnRNA undergo capping at 5' end (methyl guanosine triphosphate/mGppp), and tailing at 3' end (with poly A tail or adenylate residue), further splicing is carried out, where non coding sequences or introns are removed and coding sequence or exons are joined together/ diagrammatic representation with given markers can also be considered.

SECTION - E

31.

(a)

(i) Spermatogenesis



(Any 7 labeling to be considered=1/2 mark) / Statement in lieu of pointers should be considered.

(ii) Sertoli cells, provides nourishment to the developing sperm.

OR

(i)

- A- chasmogamous flower
- B- cleistogamous flower

(ii)

‘A’	‘B’
(1) open flower / blossom	closed flower/ Do not blossom
(2) Autogamy as well as geitonogamy and xenogamy/cross pollination	only autogamy/self-pollination

(iii)

- - In some species, pollen release and stigma receptivity are not synchronized. Either the pollen is released before the stigma becomes receptive.

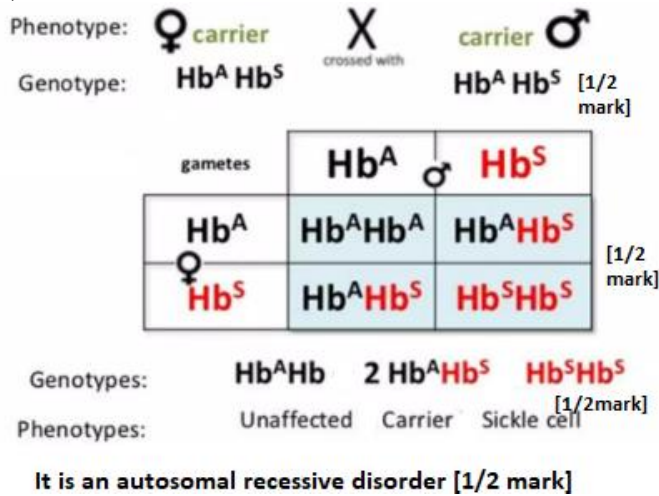
- receptive or stigma becomes receptive much before the release of pollen.
- The anther and stigma are placed at different positions so that the pollen cannot come in contact with the stigma of the same flower.
 - Self-incompatibility. This is a genetic mechanism and prevents self-pollen from fertilizing the ovules.
 - Production of unisexual flowers.
- [Any two]**

32. (a)
- (i)
- X to $\bar{X}$ is 5' $\longrightarrow$ 3'
 - No more amino acids will be added
 - as the last codon UAA is a stop codon
- (ii)
- AUG
 - Anticodon - UAC
 - methionine
- (iii)
- The amino acids are activated in the presence of ATP , and linked to their cognate tRNA or the adapter molecule,
 - Amino acids are activated so peptide bonds can be formed using this energy.

OR

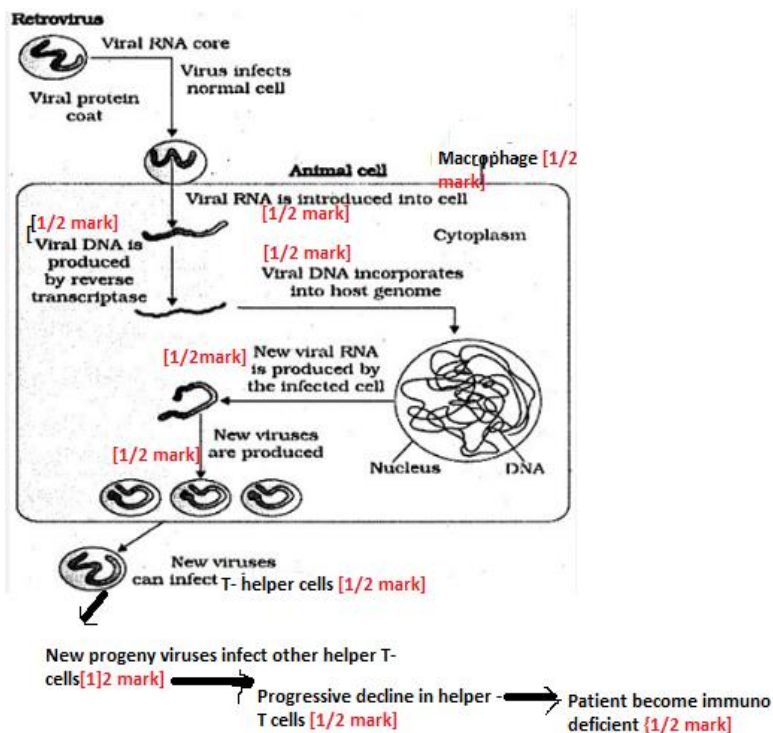
- (b)
- (i) the RBC in such patients takes up a sickle shape instead of biconcave.
- (ii) The defect is caused by the substitution of Glutamic acid (Glu) by Valine (Val) , at the sixth position of the beta globin chain of the haemoglobin molecule /The substitution of amino acid in the globin protein results due to the single base substitution at the sixth codon of the beta globin gene, from GAG to GUG.

(iii)



33.

(a) HIV enters human body and enter macrophage cells , where viral RNA is introduced in the cell, Viral DNA is produced by reverse transcription, Viral DNA incorporated in host genome, New viral RNA is produced by the infected cell, New viruses are produced, which enter T-helper cells replicate and produces its progeny, Progeny viruses attack other T helper cells, this is repeated leading to progressive decline in the number T helper cells, person become immunodeficient and HIV AIDS develop /



OR

(b)

(i)

- Chills , and high fever occurs in a cyclic order/every 2-3 days,
- fever is due to the toxic haemozoin,
- release at the time of RBC rupture.

(ii)

