

SECTION-A

1.	(A)/ antipodal, zygote and endosperm
2.	(A)/ Aneuploidy
3.	(D)/ P – Transcription, Q – mRNA, R – Translation
4.	(A)/ A – connective, B – Endothecium, C – Pollen grain
5.	(C)/ Ovum - A, Morula - E, Blastocyst - G
6.	(C)/ A - III, B - I, C - IV, D - II
7.	(C)/ Autosomal Recessive
8.	(B)/ Antigen- Antibody interaction
9.	(B)/ Divergent evolution
10.	(D)/ Restriction Enzymes
11.	(D)/ Y chromosomes
12.	(D)/ A - (ii), B - (iv), C – (i), D – (iii)
13.	(C)/ (A) is true, but (R) is false.
14.	(A)/ Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
15.	(A)/ Both Assertion (A) and Reason (R) are true and Reason (R) is 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).

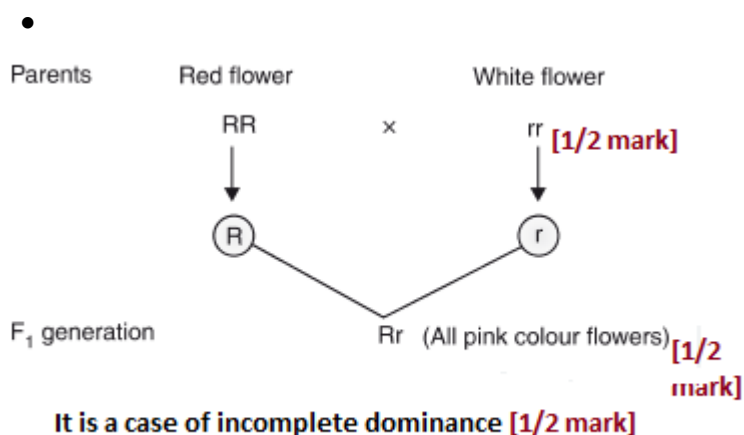
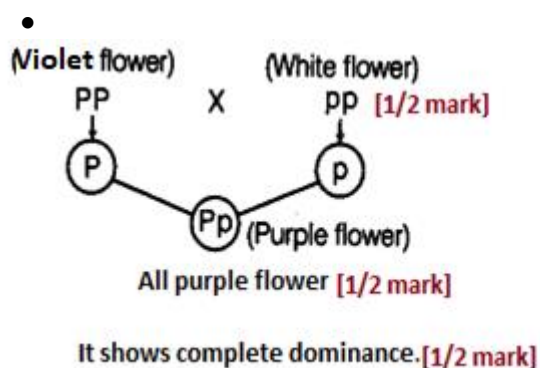
SECTION - B

17.	- Artificial insemination refers to the transfer of semen collected from the husband or male donor into the vagina or into the uterus of the female. It is medically advised when: (i) The male partner is unable to inseminate the female. (ii) The sperm count is low in the ejaculate.
18.	- The genetically – engineered lymphocytes have a limited life span or are mortal hence the patient requires periodic infusion of genetically engineered lymphocytes. - There could be a permanent cure if the gene isolated from bone marrow cells producing ADA is introduced into the cells at early embryonic stage.
19.	X- In woman X thickness of uterine wall increases after mid of menstrual cycle; Reason- due to fertilization of egg/pregnancy/conceived

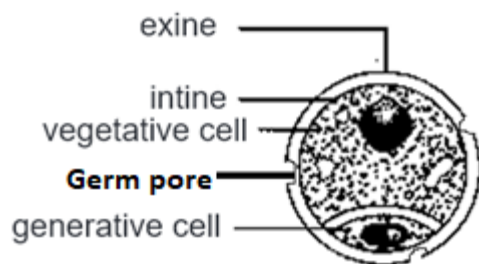
	Y- In woman Y thickness of uterine wall decreases after mid o menstrual cycle ; Reason- egg has not been fertilized/leading to th breakdown of lining of the uterus/menstrual flow/ bleeding.												
20.	(a) Biodiversity hotspots are the regions with very high level of species richness, and high degree of endemism (b) Western Ghats, The Himalayas, Indo – Burma region (Any two)												
21.	(a) <table><tr><th></th><th>Grazing Food Chain</th><th>Detritus Food Chain</th></tr><tr><td>1.</td><td>It starts with producers.</td><td>Starts from dead organic matter/ detritus</td></tr><tr><td>2.</td><td>2nd trophic level is occupied by herbivores.</td><td>2nd trophic level is occupied by detritivores.</td></tr><tr><td>3.</td><td>In aquatic ecosystem a major fraction of energy flows through this type of food chain</td><td>In terrestrial ecosystem much larger fraction of energy flow through such type of food chain</td></tr></table> (Any two corresponding points points) OR (b) - Brood parasitism is a method of parasitism in which the parasitic bird lays its eggs in the nest of the host bird and let the host bird to incubate them. - Example – The cuckoo bird lays its eggs in the nest of crow, egg o cuckoo bird resembles crows' egg in size and colour to reduce th chance of host bird detecting and ejecting them from nest		Grazing Food Chain	Detritus Food Chain	1.	It starts with producers.	Starts from dead organic matter/ detritus	2.	2 nd trophic level is occupied by herbivores.	2 nd trophic level is occupied by detritivores.	3.	In aquatic ecosystem a major fraction of energy flows through this type of food chain	In terrestrial ecosystem much larger fraction of energy flow through such type of food chain
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SECTION - C

22.



23.



[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.

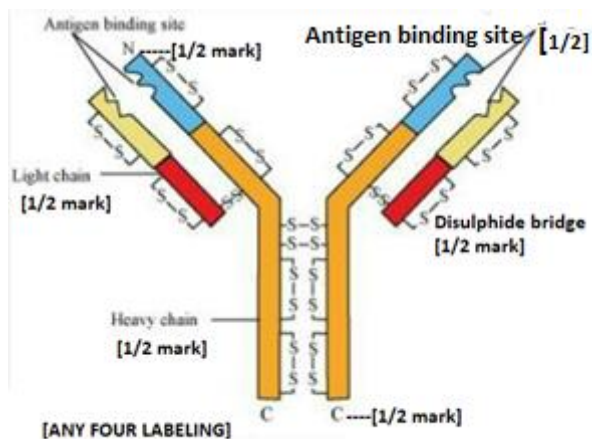
Germ pore- Pollen tube emerges from this point.

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

24. (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

25. (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 disease 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.

26. (a)
- A– vector DNA,
 - B is foreign DNA/ Desired DNA/ Alien DNA

(b)

5' G A A T T C 3'
3' C T T A A G 5'

	SECTION - D
29.	(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. (c) • In prokaryotes - 1 • In eukaryotes-3 OR (c) In prokaryotes the transcription takes place in the cytoplasm/cytosol whereas in Eukaryote transcription occurs in the Nucleus,
30.	(a) • A- exponential growth curve/ J-shaped curve • B- Logistic growth curve/ S- shaped curve/ sigmoid curve

SECTION - E

31.

(a)

(i)

(1) Menstruation phase – This flow is due to breakdown of endometrium lining of uterus and blood vessels along with unfertilized ovum continues for 3-5 days. This happens when ovum is not fertilized.

(2) Follicular phase – In this phase follicle develops into mature Graafian Follicle. This is known as proliferative phase because endometrium lining regenerates. It last for 10 days.

(3) Luteal phase – This phase lasts for about 10-14 days. This is also known as secretory phase. In this phase corpus luteum is formed which secretes large amount of progesterone that is required for maintenance of pregnancy.

(ii)

- Yes,
- Chances of fertilization are nil if abstain from Coitus from day 10-17th day of menstrual cycle.

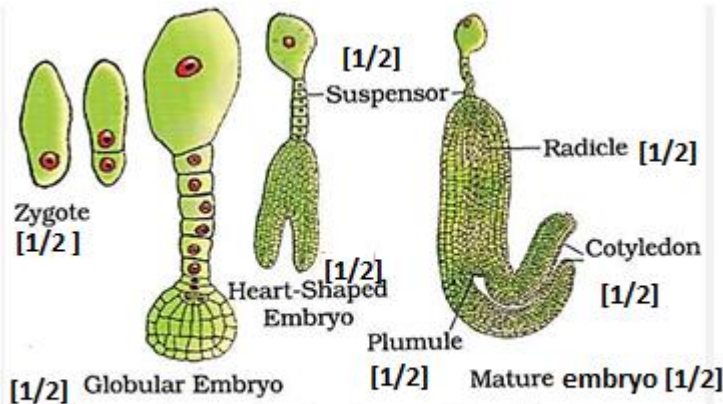
OR

(b)

(i)

- The embryo development starts only after a certain amount of endosperm is developed because it is an adaptation for assured nutrition to the developing embryo thus endosperm development precedes embryonic development
- To provide nutrition to the embryo.

(ii)

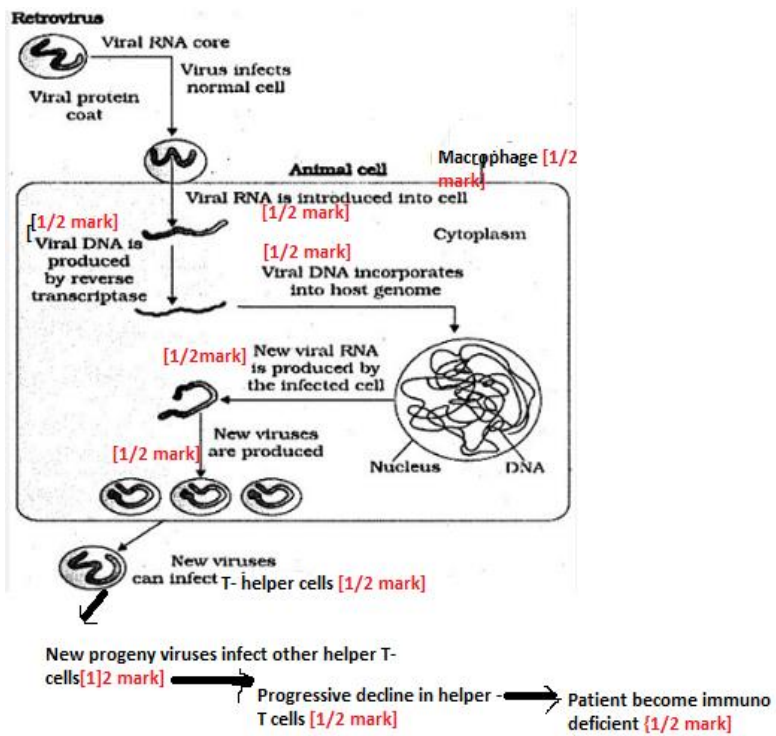


Stages in embryo development in a dicot

[Any 6 labeling to be considered]

32.

(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./

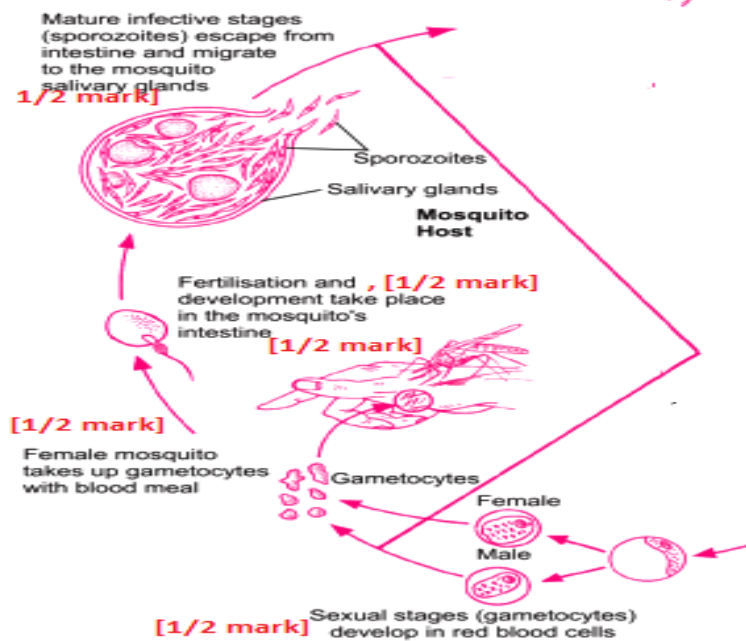


OR

(b)
(i)

- Chills , and high fever 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)



33. (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.

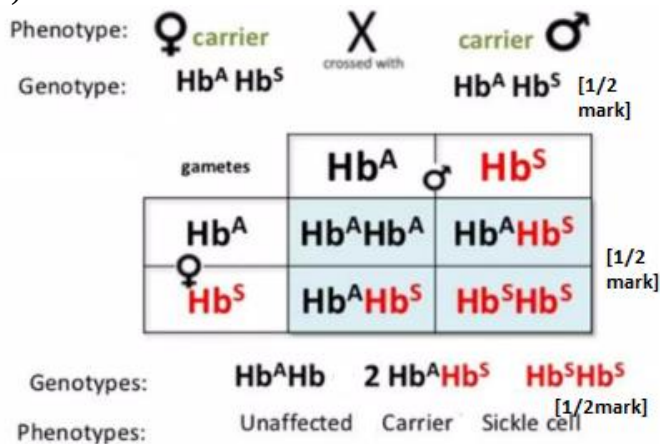
OR

(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)



It is an autosomal recessive disorder [1/2 mark]