

SECTION-A

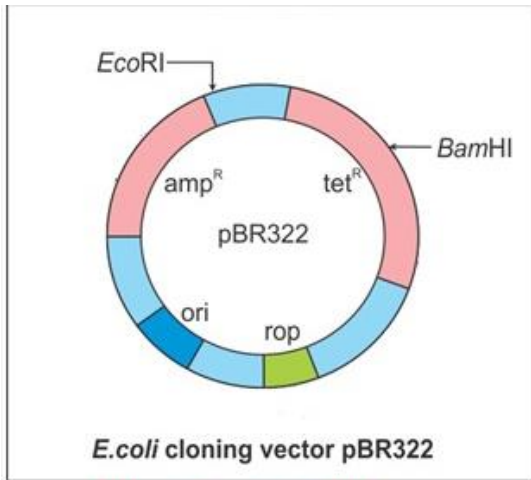
1.	(A)/ antipodal, zygote and endosperm
2.	(A)/ A – connective, B – Endothecium, C – Pollen grain
3.	(C)/ Autosomal recessive
4.	(D)/ P – Transcription, Q – mRNA, R – Translation
5.	(B)/ Evening primrose
6.	(C)/ A - (ii), B – (iv), C – (iii), D – (v)
7.	(C)/ A - III, B - I, C - IV, D - II
8.	(C)/ Ovum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

SECTION - B

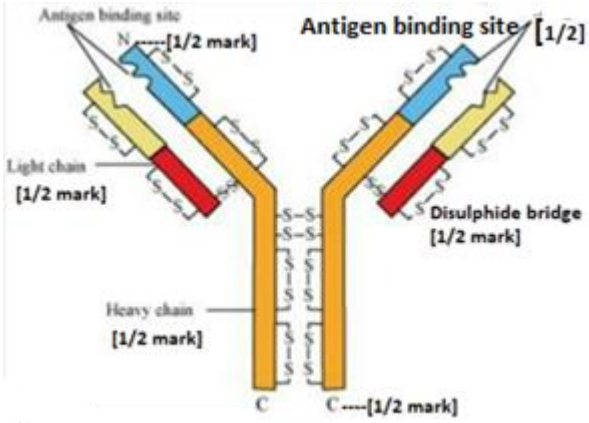
17.	(a) Rosie is the first transgenic cow (b) The milk contained human protein alpha-lactoalbumin (2.4 g per liter) which is nutritionally a more balanced product than natural cow-milk.
18.	• X- In woman X thickness of uterine wall increases after mid of menstrual cycle; Reason- due to fertilization 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.
19.	(a) Sharing of injection needles or surgical instruments etc. with an infected person, Transfusion of blood contaminated with HIV/Hepatitis B virus, An infected mother to the foetus through placenta [Any Two] (b) For proper treatment and to prevent spread of the disease.
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]

SECTION - C

22.



[1/2 mark for each labeling]

23.	Nematode – Specific genes were introduced into the host plant (tobacco) by using Agrobacterium vectors, the introduction of DNA produced both sense and antisense RNA in the host cells, these two RNA's being complimentary to each other formed a dsRNA, that initiated RNAi, and thus silenced the specific mRNA of the nematode, and thereby controlled the infestation.
24.	(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.
25.	(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) <i>Dryopithecus</i> (ii) <i>Ramapithecus</i>
26.	(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

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

(Any four labelings 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 labelings with their respective correct function only]

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

SECTION - E

31.

(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.

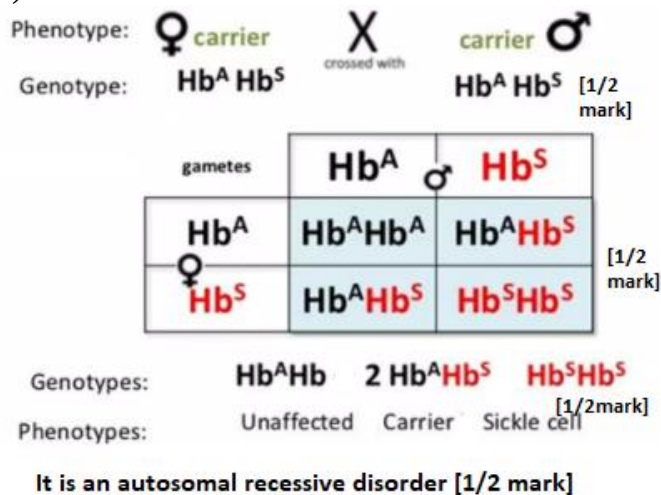
OR

(b)

(i) the RBC in such patients takes up a sickle shape instead of biconcave.

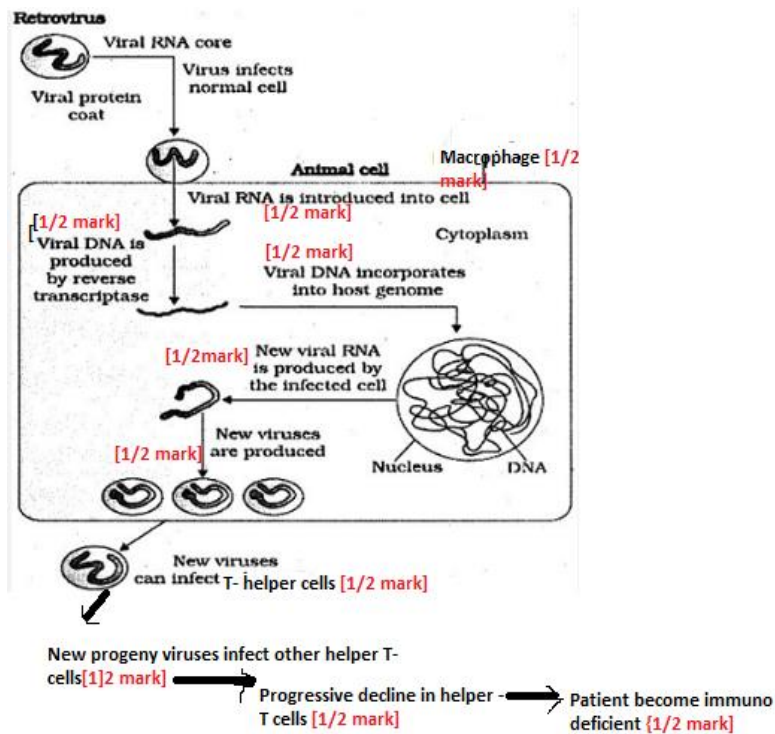
(ii) The defect is caused by the substitution of Glutamic acid (Glu) by Valine (Val) ,at the sixth position of the beta globin chain of the haemoglobin molecule /The substitution of amino acid in the globin protein results due to the single base substitution at the sixth codon of the beta globin gene, from GAG to GUG.

(iii)



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./

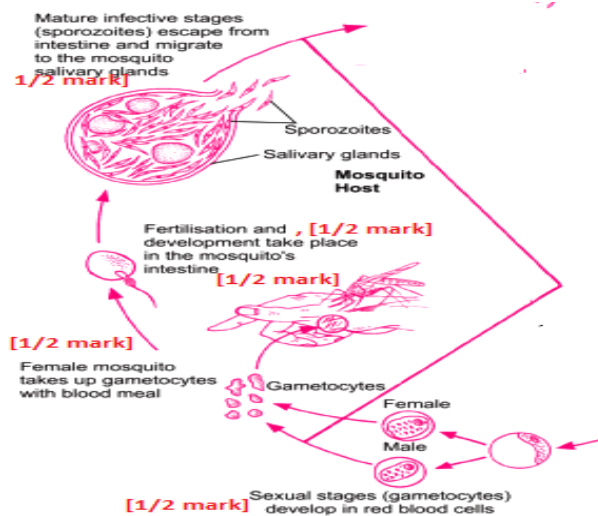


(b)

(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)



33.

(a)

(i) To combine desirable characters from two different varieties , so as to obtain improved/ superior variety

(ii) If the female parent plant bears bisexual flowers, it is necessary to remove the anthers from the flower before its dehiscence. which is called emasculation , such flowers are then bagged , (with butter paper bags of suitable size) to prevent contamination of its stigma. which is called bagging , When the stigma of bagged flower attains receptivity, mature pollen collected from anthers of the male parent are dusted on the stigma , and flower is rebagged and fruit is allowed to develop.

OR

(b)

(i) After implantation, finger-like projections appear on the trophoblast called chorionic villi , which are surrounded by uterine tissue and maternal blood , The chorionic villi and uterine tissue become interdigitated with each other , and jointly form a structural and functional unit between developing embryo and maternal body called placenta.

(ii) Placenta facilitates supply of O_2 and nutrition to the embryo , and removal of CO_2 and waste from foetus , Placenta also acts as endocrine tissue and produces several hormones hCG hPL estrogen progesterone essential for maintaining pregnancy.