CBSE Question Paper 2008

Delhi Set-1

CBSE Class-12 Biology

General Instructions:

1. All questions are compulsory
2. This question paper consist of section A, B, C and D. A contain 8 questions of one mark each, section B is of 10 questions of two marks each, section C is of 9 questions of three marks each and section D is of 3 questions of five marks each.
3. There is no overall choice. however, an internal choice has been provided in one question of 2 marks., one question of 3 marks and two questions of 5 marks weight age. a student has to attempt only one of the alternatives is such questions.
4. Whenever necessary, the diagram draw should be neat and properly labeled.

SECTION – A

1. Name any two vertebrate body part that are homologous to human forelimbs.

Ans. Forelimbs of horse/ cow/ dog/ cat…

Wings of birds/ bat.

Flippers of dolphins/ whale/ seal…

2. When and why do some animals like snails go into aestivation?

Ans. Summer,

To survive from heat / to escape from desiccation.

3. What is the economic value Spirulina?

Ans. Food rich in proteins// single cell protein// reduces pollution if grown in large quantities in waste waters.

4. What was the speciality of the milk produced by the transgenic cow Rosie?

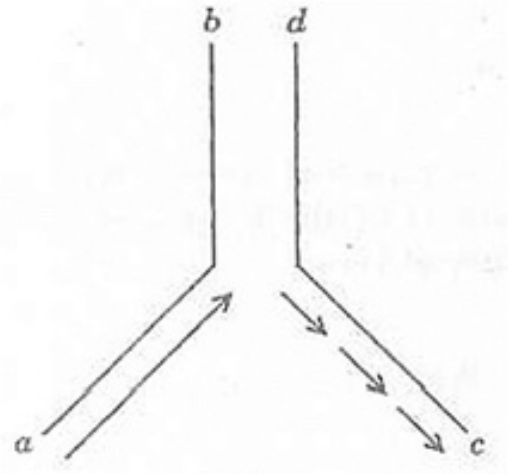
Ans. Contains humans alpha lactalbumin,

More balanced nutritionally than normal cow milk.

5. How do neutrophils act as a celluler barrier to pathogen in humans?

Ans. Phagocytose/ kill/ destroy microbes.

6. Mention the polarity of the DNA strands a-b and c-d shown in the replicating fork given below.



Ans. a-b = 3 '- 5 '
c-d = 5' - 3'

7. Mention any two significant roles predation plays in nature.

Ans. Conduits of energy transfer to the next trophic level/prey is kept under control/help in biological/ maintains species diversity. (Any two)

8. Why is the polar region not a suitable habitat for tiny humming birds?

Ans. When volume is considered surface area is large of heat is more cooler region/ difficult to generate more heat.

SECTION B

9. (a) Expand IUD.

(b) Why is hormone releasing IUD considered a good contraceptive to space children?

Ans. (a) Intra Uterine Device.

(b) Increases phagocytosis of sperms, reduces sperm mobility, makes utreus unsuitable for implantation, makes cervix hostile to sperms (Any two)

10. Name the interaction in each of the following:
(a) Cuscuta growing on a shoe flower plant
(b) Mycorrhizai living on the roots of higher plants
(c) Clown fish living among the tentacles of sea anemone
(d) Koel laying her eggs in crow's nest

Ans.(a) Parasitism.

(b) Mutualism

(c)Commensalism

(d)Brood parasitism.

11. A plant of Antirrtinum majus with red flowers was crossed with another plant of the same species with white flowers.The plants of the F_1 generation bore pink flowers.Explain the pattern of inheritance with help of a cross.

Ans.

Parents - Red Flower (RR) x White Flower (rr)

Gametes - (R) (r) = ½

F_1 Rr - Pink = ½

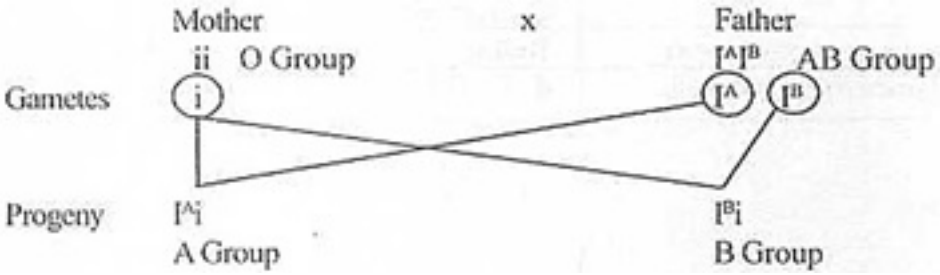
Because gene for red is not completely dominant over the recessive gene.

Pattern of inheritance-Incomplete dominance

OR

A women with blood group O married a man AB group.Show the blood group of the progency.List the alleles involved in this inheritance.

Ans.



Possible blood groups - A, B

Alleles - I^A, I^B, i

12. Why do sportspersons often fall a victim to cocaine addiction?

Ans. Cocaine being a stimulant, enhances performance.

13. State the difference between the first trophic levels of detritus food chain and grazing food chain.

Ans. DFC - Dead and decaying organic matter/ Dead remains of plants and animals

GFC - Living green plants/ producers

14. Coconut palm is monoecious while date palm is dioecious.Why are they called so?

Ans. Coconut palm- product(unisexual) male and female flowers in the same plant,

Date palm- produced (uinsexual) male and female flowers in separate plants.

15. How can DNA segment,separated by get electrophoresis, be visualizes and isolated?

Ans. Visualised by stanining the DNA fragmants with ethidium bromide, exposing them to UV radiation (appear as bright orange bands).
Band are cut out from agarose get, extracted from gel piece(by elution)

16. How do Darwin's finches illustrate adaptive radiation?

Ans. Orignal stock of seed eating finches migrated to different habitats(of Galapagos Island), adapted to different feeding methods, by altered, by altered beak structure, evolved into different type of finches.

17. Name the blank spaces a,b,c and d from the table below:

Type of Microbe	Scientific name	Commercial product
Bacterium	a	Lactic acid
Fungus	b	Cyclosporin A
c	*Monascus purpureus*	Statin
Fungus	*Penicillium notatum*	d

Ans. a – Lactobacillus

b - Trichoderma polysporum

c - Yeas

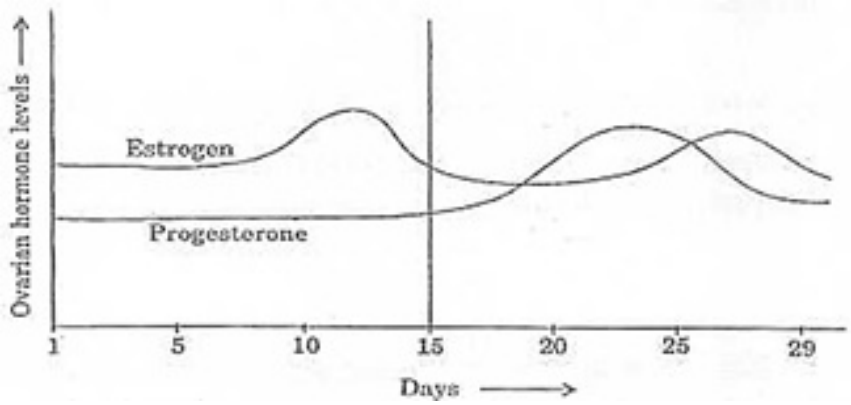
d - Peniciliin

18. DDT content in the water of a lake that supplies drinking water to the near by village, is found to be 0.003 ppm. The kingfishers of that area are reported to have 2 ppm of DDT. Why has the concentration increased in these birds? What harm will this cause to the bird population? Name the phenomenon.

Ans. DDT neither excreted nor metbolised, interferes with Calcium metabolism, decline in bird population/ due of thinning of egg/shell/ premature breaking of eggs, bio-magnification.

SECTION C

19. (a)



Read the graph given above and correlate the utcrinc events that take place according to the hormonal levels on

(i) 6-15days

(ii) 16-25days

(iii) 26 - 28 days (if the ovum is not fertilised)

(b) Specify the sources of the hormones mentioned in the graph.

Ans. (a) (i) Regeneration of endometrium.
(ii) Uterus gets highly vascularised, ready for embryo implantation
(iii) Disintegration of the endometrium
(b) Estrogen - by ovarian follicle.
Progesterone - Corpus luteum

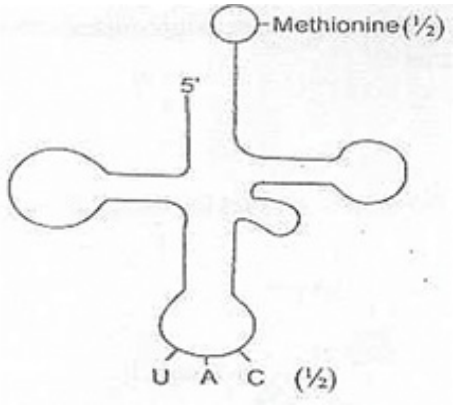
20. Explain the role of baculoviruses as biological control agents. Mention their importance in organic farming.

Ans. Baculoviruses produce narrow spectrum insecticides kill insect and other arthropods which are species specific, does not affect non target organisms / no negative impact on other insects, mammals, birds. Or fish.

Eliminates Use use of chemical pesticides, / conserves beneficial insects/ integrated pest management.

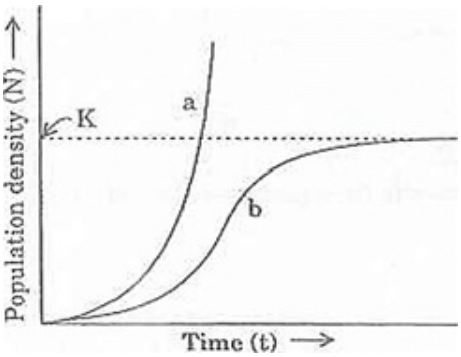
21. (a) Draw the structure of the initiator tRNA adaptor molecule.
(b) Why is tRNA called an adaptor molecule?

Ans. (a)



Clover leaf shape
b. On one hand it reads the code
On the other hand it binds to specific amino acid.

22.



Study the population growth curves shown above.

(i) identify curves 'a' and 'b'.

(ii) Mention the conditions responsible for the curves 'a' and 'b' respectively,

(iii) Give the necessary equation for the curve 'b'.

Ans. (i) a-exponential curve

b-logistic curve

(ii) a - unlimited food resource/ responses are not limiting the growth.

b-limited food resource/ responses are liming the growth.

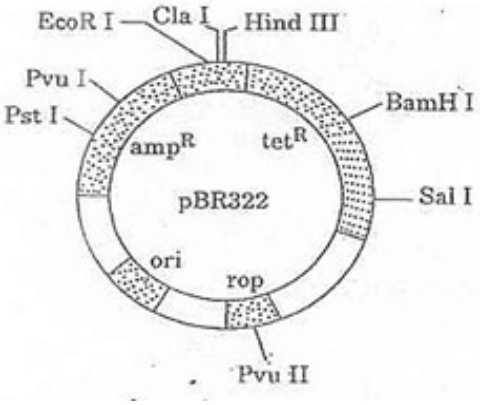
(iii) $\frac{dN}{dt} = rN\left(\frac{K-N}{k}\right)$

23.why is Agrobacterium tumefaciens good cloning vector? Explain.

Ans. If any desired/ foreign gene is linked with, Ti plasmid of Agrobacterium tumifaciens the bacterium is modified into non-pathogenic, plasmid is cloned into multiple copies, can be delivered into a variety of plants, desired chemical will be produced.

OR

Explain the importance of (a) ori, (b) amp^R and (c) rop in the E. coli vector shown below:



Ans. (a) ori-origin of replication.

(b) anipR - ampicillin antibiotic resistant gene

(c) rop - gene to produce the proteins involved in the replication of the plasmid.

24.

Study the mRNA segment given above which is complete to be translated into a polypeptide chain.

(í) write the codons 'a'and 'b'

(ii) What do they code for?

(iii) How is peplidc bond formed between two amino acids in the ribosome?

Ans. (i) a - AUG

b-UAA/ UAG/ UGA

(ii) AUG codes for Methionine.

UAA/ UAG/ UGA - Stop codon/ Nonsense codon/ Does not code for any amino acid.

(iii) Charged tRNAs arc brought closer together on mRNA in the ribosomes, ribosome acts as a catalyst (ribozyme) forming peptide bond.

25. (a) Name the infective stage of Plasmodium which mosquito takes in along with

the blood meal from an infected human.

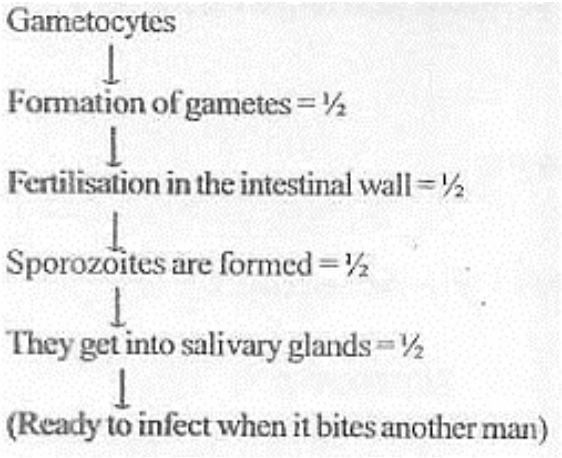
(b) Why docs the infection cause fever in humans?

(c) Give a flow chart of the part of the life- cyclc of this parasite passed in the insects.

Ans. (a) Gametocyte

(b) Haemozoin released during the rupture of RBC causes fever

(c)



26. A factory drains its waste water into the nearby lake. It has caused algal bloom.

(a) How was the algal bloom caused?

(b) What would be the consequences?

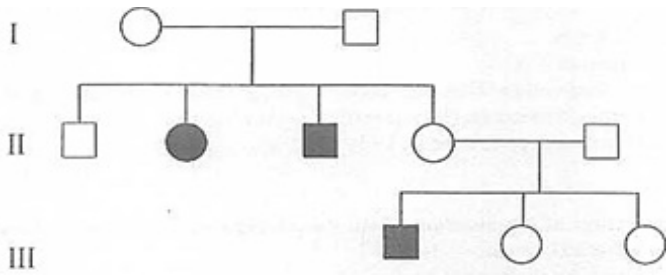
(c) Name the phenomenon that caused it.

Ans. (a) Nutrients in the waste water causes / extensive growth or proliferation of planktonic or free floating algac.

(b) Algae use O_2 BOD value goes high, deterioration of water quality, high fish mortality, scum and unpleasant odour/ lake gets choked/ faces death (any four)

(c) Eutrophication.

27. Study the given pedigree chart and answer the question that follow.



(a) Is the trait recessive or dominant?

(b) Is the trait sex-linked or autosomal?

(c) Give the genotypes of the parents in generation I and of their and fourth and fourth child in generation II.

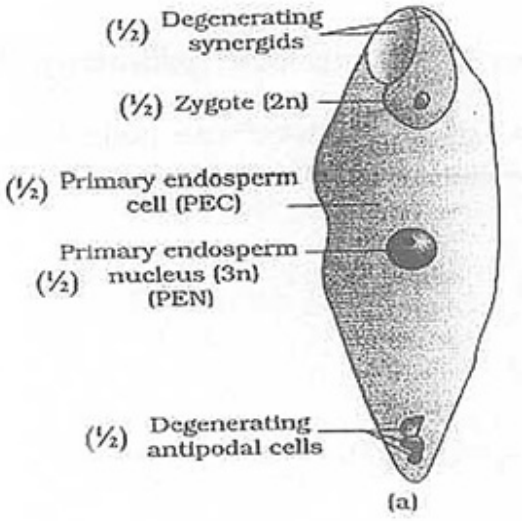
Ans. (a) a - Reccessive
(b) b-Autosomal
(c) C- Parents Aa and Aa

Third child -aa
Fourth child – Aa
Any other alphabet can be taken in piacc of A and a.

SECTION D

28. (a) Draw a schematic labelled diagram of a fertilised embryo sac of an Angiosperm.
(b) Describe the stages in embryo development in a dicot plant.

Ans. (a)

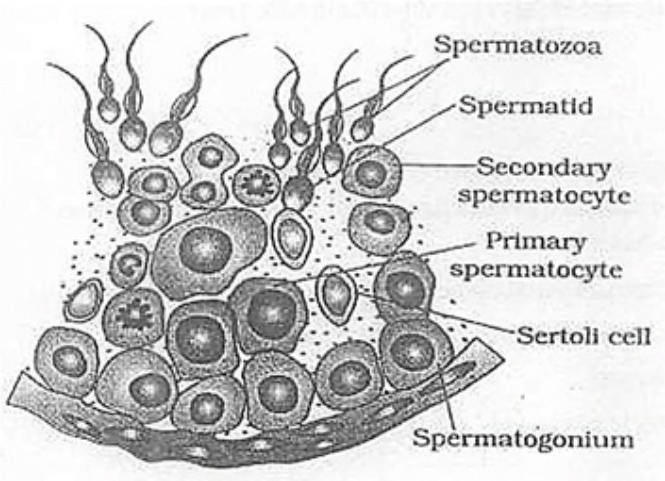


(b) The zygote divides unequally to form to cells,
The smaller cell divides repeatedly to produce a row of 4-8 cells,
The terminal cell divides to produce a cluster of cells called the globular embryo/ proembryo
The remaining cells constitute the suspensor,
A few cells of the proembyo nearest of the suspensor develop into hypocotyl and radicle while other cells give rise to epicotyl, plumule and cotyledons.

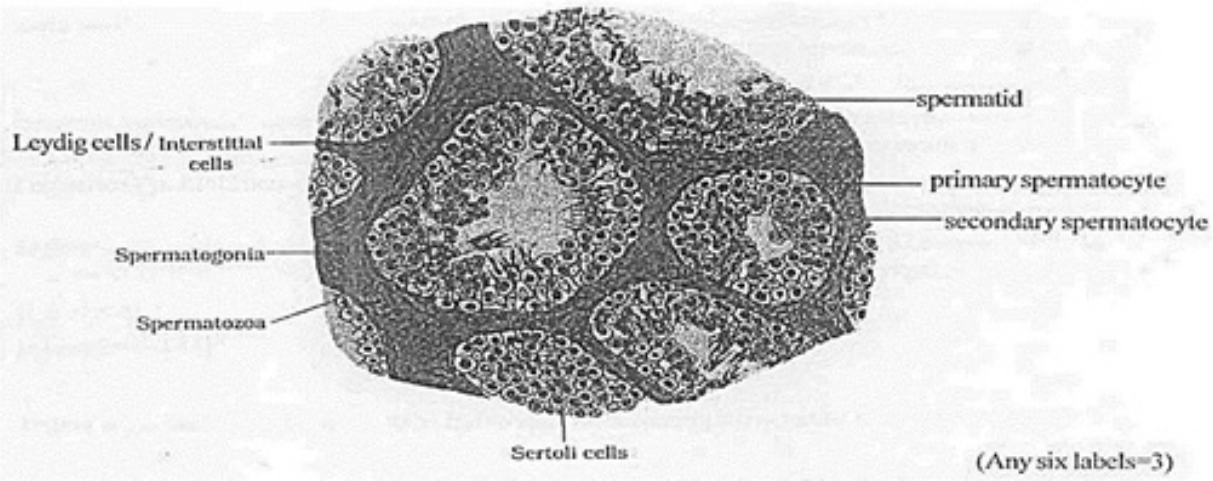
OR

(a) Draw a labelled diagram of a sectional view of human seminiferous tubule.
(b) Differentiate between gametogenesis in human males and females on the basis of
(i) time of initiation of the process.
(ii) products formed at the end of the process.

Ans. (a)



OR



(b) (i) Male-puberty

Female-foetal/ embroyic stage

(ii) Male-sperm/ spermatozoan

Female-ovum

29. Explain the steps involved in the production of genetically engineered insulin.

Ans. Gene for chain A and gene for chain B of insulin are prepared, inserted into plasmid, of E.coliseparately. E.coli cultured and chain extracted,combined by disulphide bond (to produce human insulin).

OR

(a) Name the nematode that infest and damage tobacco roots.

(b) How are transgenic tobacco plants produced to solve this problem?

Ans.(a) Meloidegyme incognitia

(b) Nematode specific genes isolated cloned and introduced into tobacco plants,

ds RNA are produced and RNAi interference initiated,

mRNA translation silenced.

survival of the nematode not possible in the host plants.

30. What is 'semi-conservative' DNA replication? How was it experimentally proved and by whom?

Ans. After the completion of replication (of one DNA molecule into two) each DNA molecule will have one parental strand and one newly synthesized strand.

Messelson and Stahl

*Ecoli grown in medium containing $^{15}NH_4Cl(^{15}N - heavyNitrogen)$, for many generations to ensure that all DNA in the bacteria were heavy,

*Heavy E.coli transferred to a medium with normal $^{14}NH_4Cl\,(after\,20\,minutes)$ DNA of generation 1 extracted to measure their densities, they were of intermediate density

*After 40 minutes DNA of II generation were extracted and tested for their densities, they were of equal amounts of (hybrid) intermediate DNA, and light $DNA/^{14}NH_4Cl$.

OR

A homozygous tall pea plant with green seeds is crossed with a dwarf pca plant with yellow seeds.

(i) What would bc the phenolypc and genotype of F_1?

(ii) Work out the phenotypic pic ratio of F_2 generation with the help of a Punnett square.

Ans. (i) Phenotype of F_1-Tall and Yellow

Genotype of F_1 -TtYy

(ii)

F1 TtYy x TtYy

F2

	TY	Ty	tY	ty
TY	TTYY Tall & Yellow	TTYy Tall & Yellow	TtYY Tall & Yellow	TtYy Tall & Yellow
Ty	TTYy Tall & Yellow	TTyy Tall & Green	TtYy Tall & Yellow	Ttyy Tall & Green
tY	TtYY Tall & Yellow	TtYy Tall & Yellow	ttYY Dwarf & Yellow	ttYy Dwarf & Yellow
ty	TtYy Tall & Yellow	Ttyy Tall & Green	ttYy Dwarf & Yellow	ttyy Dwarf & Green

Tall & Yellow : Tall & Green : Dwarf & Yellow : Dwarf & Green

9 : 3 : 3 : 1

Male gametes= $\frac{1}{2}$

Female gametes = $\frac{1}{2}$

Punnett square = $\frac{1}{2}$

Foure phenotype = 2

Ratio = $\frac{1}{2}$