CBSE Question Paper 2008

Delhi Set-3

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

Ans. Contains humans alpha lactalbumin,More balanced nutritionally than normal cow milk.

2. What is the economic value of Spirulina?

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

3. Suggest any Iwo techniques which can help in early detection of bacterial/viral infections much before the symptoms appear in the body.

Ans. Recombinant DNA Technology, Polymerase Chain Reaction, ELISA (any two)

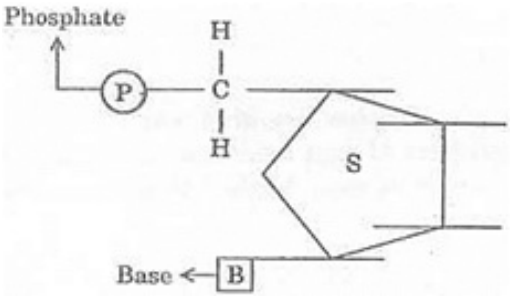
4. When and why do some animals like snails go into aestivation?

Ans. Summer,To survive from heat/ to escape from desiccation.

5. 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.

6. Mention the carbon positions to which the nitrogenous base and the phosphate molecule are respectively linked in the nucleotide given below:



Ans. Base – 1st carbon

Phosphate – 5th carbon

7. Given below are some human organs. Identify one primary and one secondary lymphoid organs:

Liver, Thymus, Stomach, Thyroid, Tonsils.

Ans. Primary lymphoid organ -Thymus

Secondary lymphoid organ – Tonsils

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

Ans. Forelimbs of horse/cow/dog/cat…

Wings of birds/ bat.

Flippers of dolphins/ whale/ seal… (Any two)

SECTION B

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

Ans. Sport person require a lot of stamina, Cocaine is a drug which boost your stamina and helps to complete an sport successfully .

10. The 'clown' fish lives among the tentacles of sea anemone. What is this interaction between them called and why?

Ans. Commensalism

Clown fish gets protection

Sea anemone is not benefitted

11. 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.

12. How can DNA segments, separated by gel electrophoresis, be visualised 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)

13. DDT content in the water of a lake that supplies drinking water to the nearby villages, is found to be 0-003 ppm. The kingfishers of that area arc 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.

14. (a) Expand IUD.

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

Ans. (a) Intra Uterine Device.

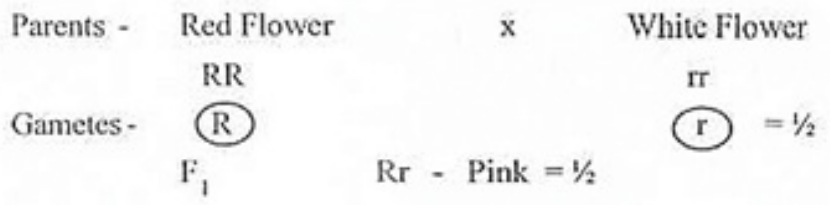
(b) Increases phagocytosis of sperms, reduces sperm mobility, makes utreus unsuitable for implantation, makes cervix hostile to sperms (Any two)

15. 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.

16. A plant of Antirrhinum 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 the help of a cross.

Ans.

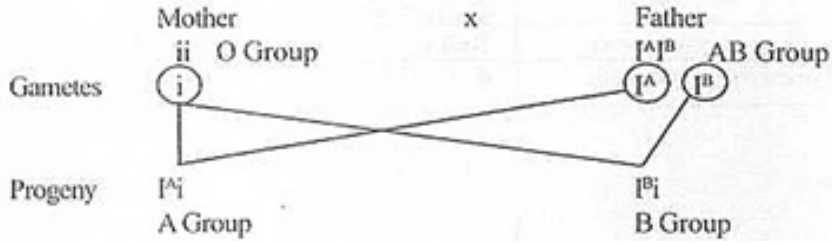


Because gene for red is not completely dominant over the recessive gene.
Pattern of inheritance-Incomplete dominance

OR

A woman with blood group O married a man with AB group. Show the possible blood groups of the progeny. List the alleIes involved in this inheritance.

Ans.



Possible blood groups - A, B
Alleles - I^A, I^B, i

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

Type of microbe	Scientific name	Product	Medical application
(i) Fungus	a	Cyclosporin	b
(ii) c	*Monascus purpureus*	Statin	d

Ans. a - Trichoderma polysporum

b - Immunosuppressive agent in organ transplant patients.

C - Yeast

d - Blood cholesterol lowering agent.

18. 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

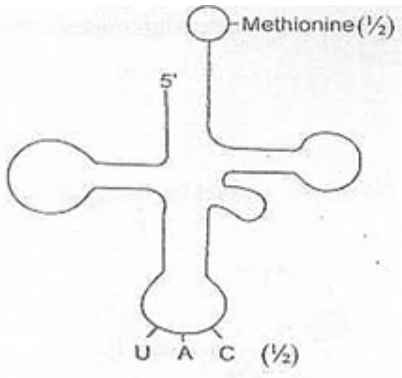
GFC - Living green plants / producers

SECTION C

19. (a) Draw the stucture 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.

20.

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

(i) Write (he codons 'a' and 'b'.

(ii) What do they code for?

(iii) How is peptide 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.

21. Name the type of immunity that is present at the time of birth in humans. Explain any two ways by which it is accomplished.

Ans. Innate immunity

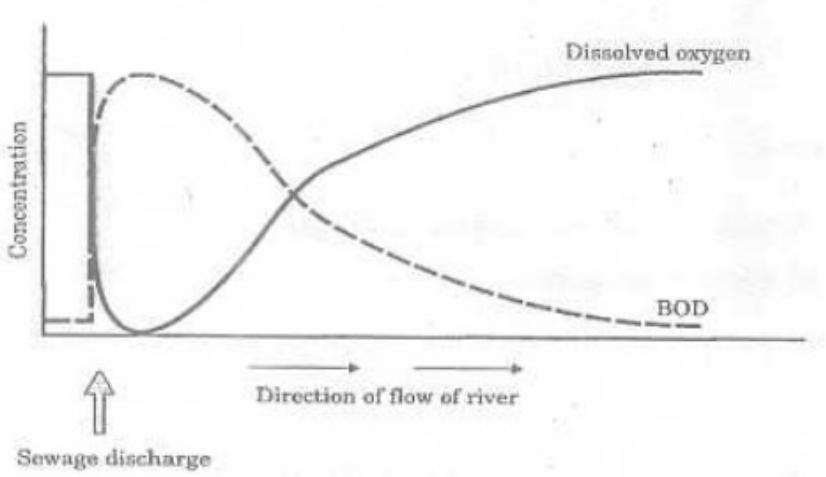
- PHYSlCAL BARRIER - Skin preventing entry of germs / mucous coating of internal organs traps germs.

- PHYSIOLOGICAL BARRIER – Acid in stomach/saliva in the mouth/tear in eyes-prevent growth of microbes.

- CELLULAR BARRIER- Any named WBC / macrophages - phagocytose / kill microbes.

- CYTOKJNE BARRIER - Interferons protected non infected cells from viral infection.

22. Study the graph given below and answer the questions that follow:



(i) What is the relationship between dissolved oxygen and biochemical oxygen demand (BOD)?

(ii) Mention their effect on aquatic life in the river.

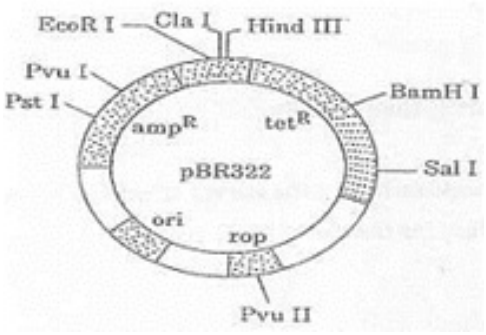
Ans. (i) When BOD is high dissolved oxygen is less H inversely proportionate
(ii) If dissolved oxygen is less and BOD is high aquatic organisms die.
If dissolved oxygen is more and BOD is low clear water organisms reappear.

23. Why Agrobacterium tumefaciens a 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, (h) amp^R and (c) rop in the E. coli vector shown below:

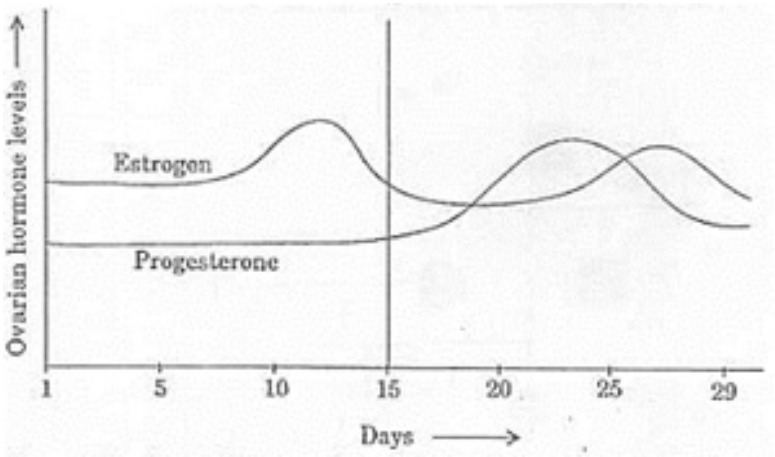


Ans. (a) ori-origin of replication.

(b) anipR - ampicillin antibiotic resistant gene

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

24. (a)



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

(i) 6-15 days

(ii) 16-25 days

(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.

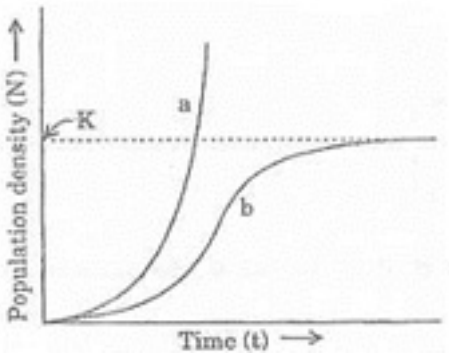
(ii) Uterus gets highly vascularised, ready for embryo implantation

(iii) Disintegration of the endometrium

(b) Estrogen - by ovarian follicle.

Progesterone - Corpus luteum [3]

25.



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

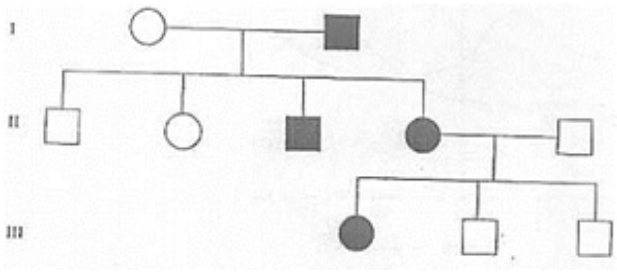
b-logistic curve

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

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

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

26.Study the given pedigree chart and answer the questions that follow.



(a) is the trait recessive or dominant?

(b) is the trait sex linked or autosomal?

(c) Give the genotypes of the parent shown in generation I and their third child shown in generation Il and the first grandchild shown in generation III.

Ans. (a) Dominant
(b) Autosomal
(c) Parents - Mother - aa
Father - Aa
Third child-Aa
First Grand child-Aa

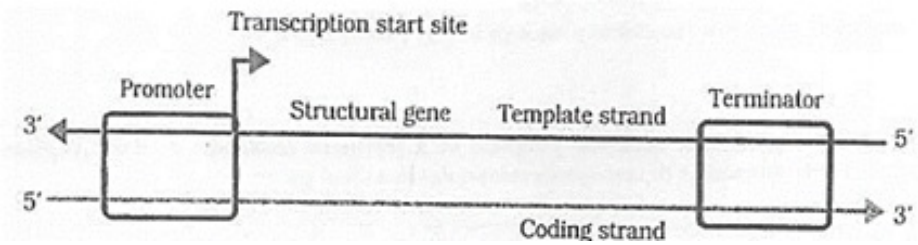
27. Explain the role of baculoviruses as biological control agents. Mention their importance in organic farming.

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.

SECTION D

28. Draw a labelled schematic structure of a transcription unit Explain the function of each component of the process of transcription

Ans.



Labelling - Polarity, promoter, structural gene, template strand, coding strand, terminator

Promoter - provides binding site for RNA polymerose / initiates transcription process

Structural gene-codes for the enzymes.

Template strand - codes for mRNA.

Terminator - ends the transcription process

OR

A snapdragon plant homozygous for red flower when cross cd with a white flower plant of same species produced pink flowers in F_1 generation.

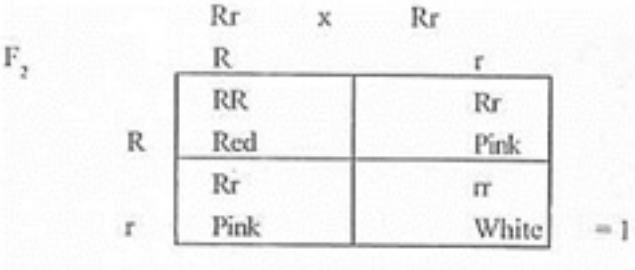
(a) What is this phenotypic expression called?

(b) Work out the cross to show the F_2 generation when F_1 was self-pollinated. Give the phenotypic and genotypic ratios of F_2 generation.

(c) How' do you compare the F_2 phenotypic and genotypic ratios with those of Mendelian monohybrid F_2 ratios?

Ans. (a) Incomplete dominance

(b)



Genotype ratio - 1 : 2 : 1

Phenotype ration - 1 :2 :1

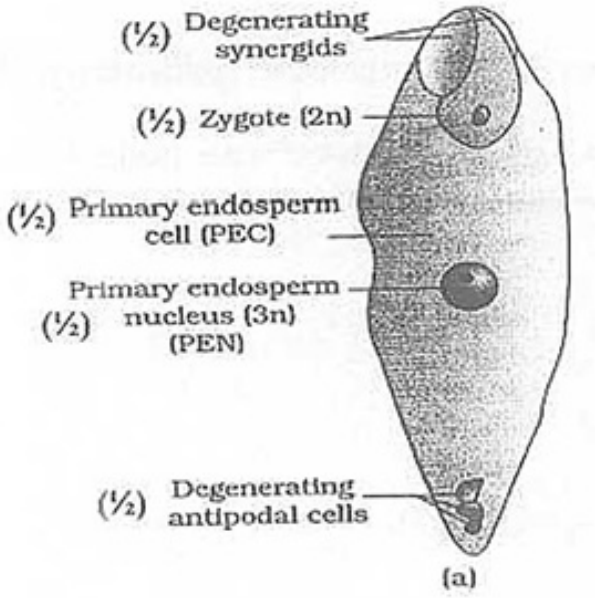
(c) Genotype ratios are the same in both

Phenotype ratio of Mendelian monohybrid is 3 : 1 while here it is 1 : 2 : 1

29. (a) Draw a schematic labelled diagram of a fertilised embryo sac of an Angiosperm.

(b) Describe the stages in embryo development iii a dicot plant.

Ans. (a)



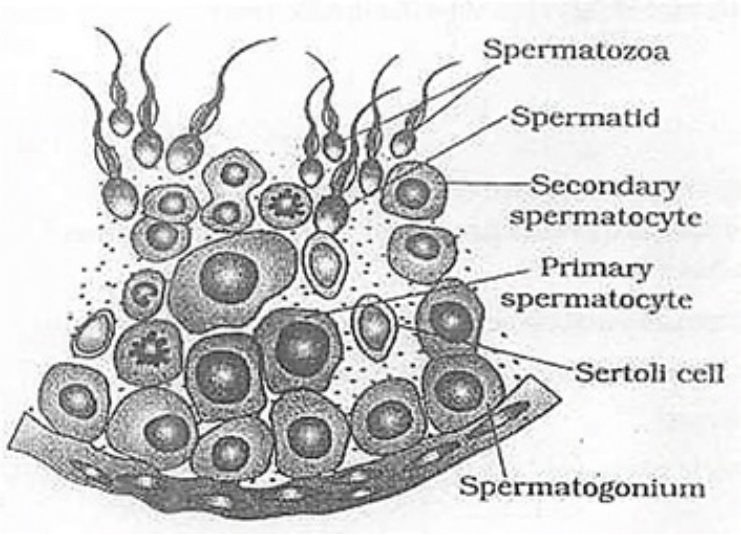
(b) The zygote divides unequally to form to cells,
The smaller cell divides repeatedly to produce a row of 4-8 cells,
The terminal cell divides to produce a cluster of cells called the globular embryo/ proembryo
The remaining cells constitute the suspensor,
A few cells of the proembyo nearest of the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

OR

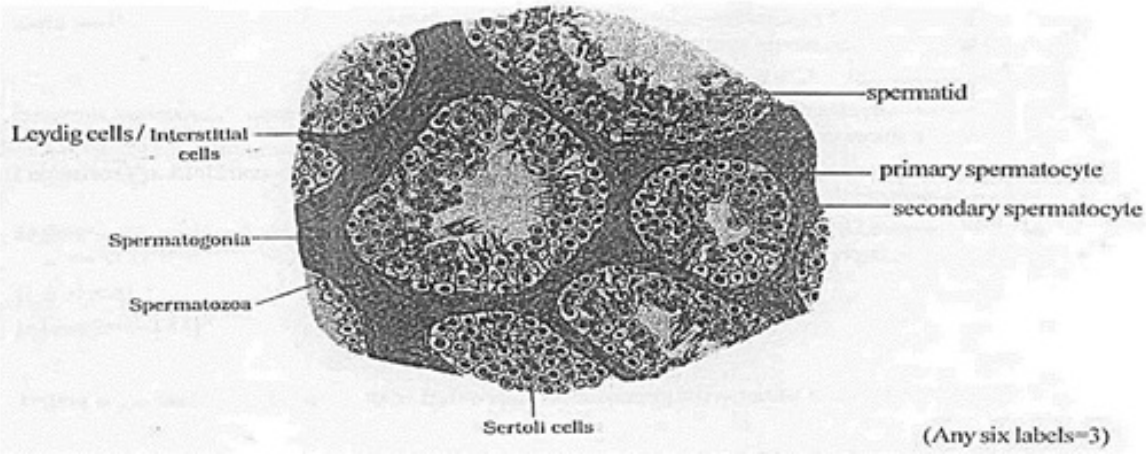
(a) Draw a labelled diagram of a sectional view of human seminiferous tubule.

(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

30. ExpIain 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 nemotode that infests and damages 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.