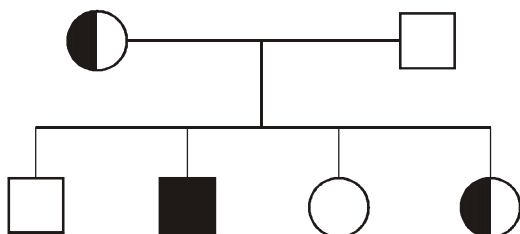


CBSE MAINS - 2008

BIOLOGY

1. (a) Father is normal. Mother is a carrier. Out of two sons one is normal and one has the disease. Out of two daughters one is normal and one is carrier. Make a pedigree chart.
- (b) If no girl is a sufferer. Then tell whether it is a case of phenylketonuria or not. Say 'Yes' or 'No' (take dominant allele as A and recessive as a). Make a punette square.



Ans. (a)

(b) No

XY normal father Gametes →	X	Y
$X X^0$ Carrier mother Gametes ↓	XX normal daughter	XY normal son
X^0	XX^0 carrier daughter	X^0Y diseased son

2. (a) BGA belongs to kingdom _____.
- (b) Differentiate gram positive and gram negative bacteria on the basis of fine structure of flagella.
- (c) Differentiate between *E. coli* and Methanogen on the basis of cell-wall structure.
- (d) Differentiate between Chlorobium and Nostoc on the basis of photosynthesis.
- (e) Differentiate between Fermentation and Anaerobic respiration

Ans.

- (a) Monera
- (b) Gram positive bacteria have only P and M.
Gram negative bacterium have L, P, S and M.
- (c) *E. Coli* – Peptodoglycan
Methanogen – Non-cellulosic polysaccharids
- (d) Chlorobium – anoxygenic photosynthesis.
Nostoc – oxygenic photosynthesis.
- (e) Fermentation – carbondioxide released, substrate is carbohydrate
Anaerobic respiration – substrate may be carbohydrate or protein

3. (a) Write the sexual spores of *Claviceps* and *Agaricus*
 (b) Name the causal organism of black rust and give the names of spores in a proper sequence.
 (c) Define standing crop and standing state.
 (d) Define Niche and Habitat.

Ans. (a) Ascospores and Basidiospores

(b) *Puccinia graminis*

Spores : Uredospores, teleutospores, basidiospores, pycniospores, aeciospores

(c) Standing crop is a total amount of biomass per unit area.

Standing state is the amount of inorganic material in the soil per unit area.

(d) Niche is specific part of habitat occupied by individuals of a species which is circumscribed by its range of tolerance, range of movement microclimate, type of food and its availability, shelter, type of predator, and timing of activity.

Habitat is a specific place or locality delimited by a combination of factors, physical features and barriers where a community resides.

4. Give the scientific name, stamen type, placentation and type of fruit of the following plants.

(a) Mustard, (b) Gram, (c) Marigold, (d) Lemon, (e) Cotton

Plants	Genus	Stamen type	Placentation	Type of fruit
Mustard	Brassica	Tetradynamous	Pareiental	Siliqua
Gram	Cicer	Diadelphous	Marginal	Pod
Ans. Marigold	Tagetes	Syngenesious	Basal	Cypsella
Lemon	Citrus	Polyadelphous	Axile	Hesperidium
Cotton	Gossypium	Monadelphous	Axile	Capsule

5. Fill in the blanks :

(a) Paddy soil are rich in methane producing _____.

(b) Two rooted plants with floating leaves _____ (angio) and _____ (pterido).

(c) Tofu and sofú are prepared from _____ by fermentation using _____.

(d) Diceous conditions is found in _____ (gymno) and _____ (angio).

Ans. (a) archaeobacteria, (b) nymphaea, salvinia, (c) soyabean, bacteria, (d) *Cycas*, *Vallisneria*

6. Match the following :

Column I	Column II
A. Arbotrys	(i) Ear
B. Phytophthora	(ii) Nose
C. Trichoderma	(iii) Lung
D. Trichophyta	(iv) Bovine
	(v) Collego
	(vi) Hair
	(vii) Skin
	(viii) Nail
	(ix) Liver
	(x) Royal
	(xi) Bioinsecticide
	(xii) Biopesticide
	(xiii) Bionematocyta

Ans. A – (xiii), B – (xi), (xii), (v), C – (vi), (vii), (viii), D – (i)

7. Match the following :

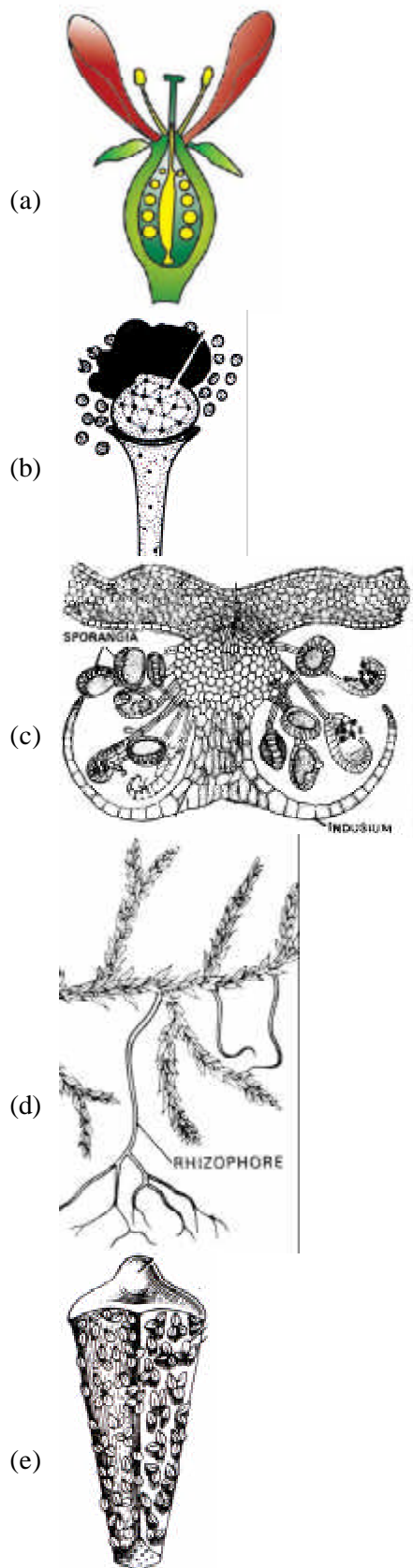
Column I	Column II
A. Ozone hole	(i) 100 km radius hole
B. Meth Hb	(ii) CFC
C. Automobile fuel	(iii) Nitrates in water
	(iv) SO ₂
	(v) Fatal to new born
	(vi) Methyl isocyanide
	(vii) N ₂
	(viii) Suspended particulate matter

Ans. A – (i), (ii), B – (vii), C – (iv), (viii)

8. (a) Virus mutplies by two methods. Name them.
(b) Working of Bt toxin in insect pest.

Ans. (a) Lytic and lysogenic.
(b) The activated toxin binds to the surface of midgut epithelial cells and create proes that cause cell swelling and lysis and eventually cause death of the insect.

9. Identify and label the diagram.



Ans. (a) Epigynous flower, (b) *Rhizopus* sporangium,
 (c) *Dryopteris* sorus, (d) *Selaginella*, (e) *Cycas* microsporophyll.

10. Answer the following questions as directed :

- (i) Differentiate between Ctenophora and Echinodermata on the basis of their level of organization and symmetry.
- (ii) Differentiate between frog and cockroach on the basis of their position of heart and respiratory organs.
- (iii) Differentiate between corpus luteum and corpus callosum on the basis where they are found and what is their function.
- (iv) **P- wave and QRS wave** : What do they represent and what do they lead to.
- (v) **Incus, malleus, stapes** : arrange them in correct order if required. What is their function as whole ?

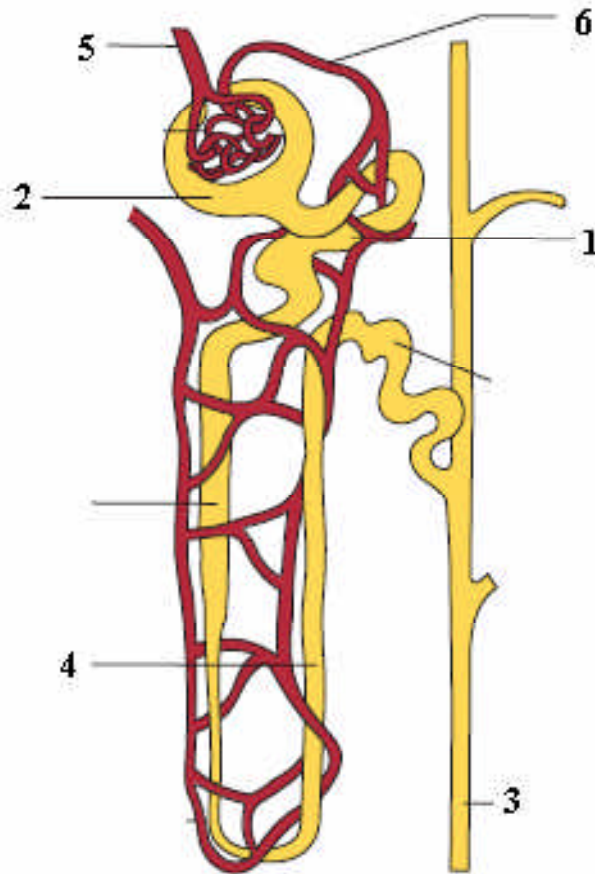
Ans.	(i)	Ctenophora	Echinodermata
	(a)	level of organisation organisation	Tissue-level System-level
	(b)	Symmetry	Radial Bilateral
	(ii)	Frog	Cockroach
	(a)	Position of heart	Ventral Dorsal
	(b)	Respiratory organ	Skin, Lungs, buccopharyngeal cavity Trachea
	(iii)	Corpus Luteum	Corpus callosum
	(a)	Location	Ovary Brain
	(b)	Function	Progesteron secretion Connects and coordinates two cerebral hemisphere
	(iv)	P-wave Auricular depolarisation or Atrial systole	QRS wave Ventricular depolarisation or Ventricular systole
	(v)	The correct order is Malleus, Incus and Stapes.	

Function : Amplification of sound wave.

11. In the given questions column I and column II are given. Column I matches with the column II. Write correct if they are, if they are incorrect then correct them.

Column I	Column II
(i) <i>Neanderthal</i>	- They have cranial capacity of 900 cc.
(ii) <i>Dryopithecus</i>	- They work more ape like and Ramapithecus work more human-like.
(iii) Hardy-Weinberg	- Allelic frequency are unstable and genetic frequency is inconstant form one generation to another generation.
(iv) Darwin's finches	- Adaptive radiations.
Ans.	
(i) <i>Neanderthal</i>	- They have cranial capacity of 1400 cc.
(ii) Correct.	
(iii) Hardy-Weinberg	- Allelic frequency are stable and genetic frequency is constant form one generation to another generation.
(iv) Correct.	

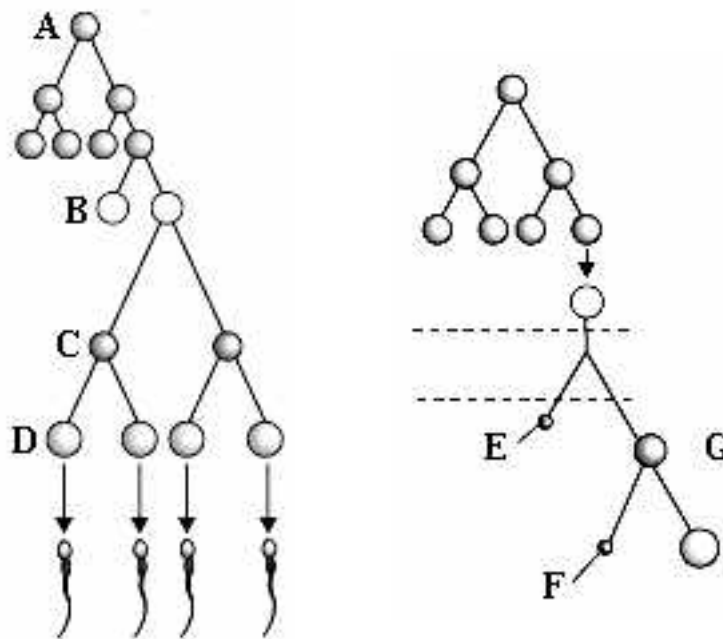
12. Answer the following questions :



- (i) Label 1, 2, 3 and 4.
- (ii) What is the function of 2.
- (iii) If diameter of 6 is doubled as compared to 5, what will be the effect.
- (iv) If prostate gland of a person is enlarged, what will be the effect on urination and why ?

- Ans.**
- (i) 1 - Proximal convoluted tubule, 2 - Bowman's capsule
3 - collecting duct, 4 - Ascending limb of Henle's loop.
 - (ii) Function of (2) Bowman's capsule - Ultrafiltration or filtration of blood.
 - (iii) Glomerular filtration rate will decrease.
 - (iv) Painful urination as urethra is compressed.

13. Given are the diagram of human spermatogenesis and oogenesis. Study them and answer the following question.



- Label A, B, C, D, E and F.
- Write the number of chromosome from A to G.
- Write the duct system in human testis after seminiferous tubule.

Ans. (i) and (ii)

A - spermatogonia - chromosome no. 46.

B - primary spermatocyte - chromosome no. 46.

C - secondary spermatocyte - chromosome no. 23.

D - spermatid - chromosome no. 23.

E - primary polar body - chromosome no. 23.

F - secondary polar body - chromosome no. 23.

G - secondary oocyte - chromosome no. 23.

- Seminiferous tubules → tubuli recti → rete testis → vas efference.

14. Answer the following questions with respect to cancer :

- Differentiate between a cancer cell and a normal cell.
- Write three techniques for the detection of cancer.
- Asbestos, Infra-red rays, Arsenic, Smoke, tobacco. Out of these which are carcinogenic.

Ans. (i) **Cancer cell**

uncontrolled power of division

Normal cell

controlled power of division

- Techniques - CAT scan (CT scan), PET, MRI.

- Asbestos, Arsenic, Smoke, tobacco are carcinogenic.

15. Answer the following questions.

- (i) Name the fluid produced initial after parturation and write its function.
- (ii) Define gametic intra fallopian transfer.
- (iii) How CuT and Cu7 serve as IUD ?
- (iv) What is ribozyme and who discovered it and in which organism.
- (v) Write the name of the disease and its karyotype for a person suffering form Gynecomastia.

Ans. (i) **Colostrum**, is highly nutritious food which contains several antibodies absolutely essential to develop resistance for the new-born babies.

(ii) Release of sperms into the fallopian tube.

(iii) Intra Uterine Devices are presently available as the non-medicated IUDs (e.g., Lippes loop), copper releasing IUDs (CuT, Cu7, Multiload 375) and the hormone releasing IUDs (Progestasert, LNG-20). IUDs increase phagocytosis of sperms within the uterus and the Cu ions released suppress sperm motility and the fertilizing capacity of sperms.

(iv) Ribozyme is a RNA based enzyme discovered by Thomas Cech and Sydney Fox from *Tetrahymna thermophilla*.

(v) Klenifeltor syndrome, 22 + XXY.

16. Match the following column.**Column I**

- (i) Passive immunity
- (ii) rDNA technology
- (iii) Kangaroo rat

Column II

- (a) IgA
- (b) Colostrum
- (c) Tear
- (d) Solid urine
- (e) do not drink H₂O
- (f) excrete urea
- (g) PCR

Ans. (i) - a, b, c, (ii) - g, (iii) - e, f.

