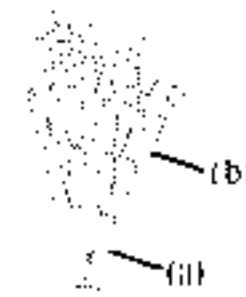


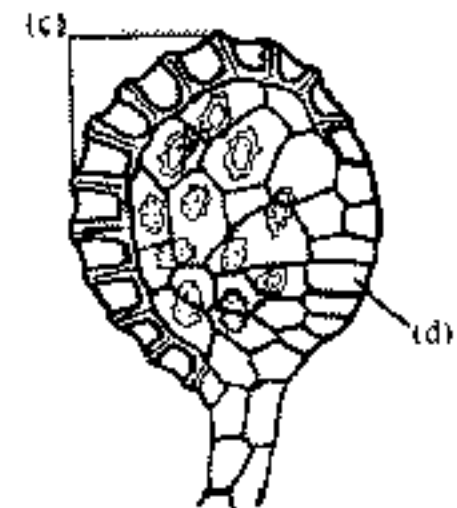
- I.** (a) Some persons say, there are no flowers in Banyan tree. comment on it.
 (b) Write two characteristics of hot spot. Name any two hot spots of india.
 (c) Write one difference between pathogen and parasites.
 (d) Define phyllode and phylloclade. Give one example of each.
 (e) Yeast is a prokaryote or eukaryote. Give evidence in favour of your answer.

- Sol.** (a) In Banyan tree hypanthodium type of inflorescence is found and in hypanthodium type of inflorescence, flowers are enclosed inside the modified peduncle.
 (b) Characteristics of hot sopt
 (1) Number of endemic species
 (2) Degree of threat
 Two hot spot of India = (1) Western Ghat (2) The Eastern Himalay as
 (c) Parasites live on or in side the host to obtain their nutrition, while pathogens are disease causing living organisms.
 (d) Phyllode → It is petiolate modification. In it petiole is modified into leaf like structure or flat structure and functions as normal leaf. e.g. → *Australian acacia*.
 Phylloclade → It is stem modification. In it stem is modified into a flat, fleshy and green leaf like structure and it carries out photosynthesis. e.g. → *Opuntia*
 (e) Yeast is a eukaryote, because in Yeast cellular organelles are present, nucleus is covered by membrane and histone associated with DNA.

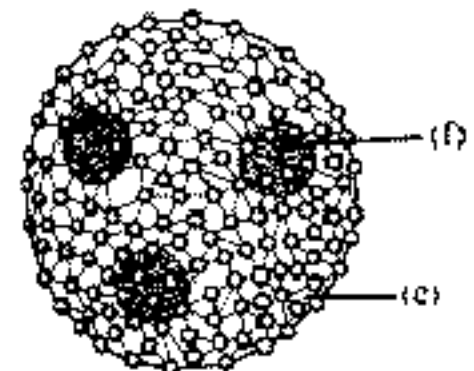
- 2.** (i) Identify the given diagram and label (a) or (b)



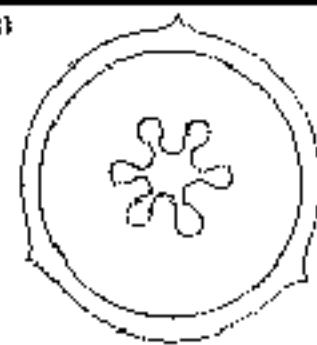
- (ii) Identify the given diagram and label (c) or (d)



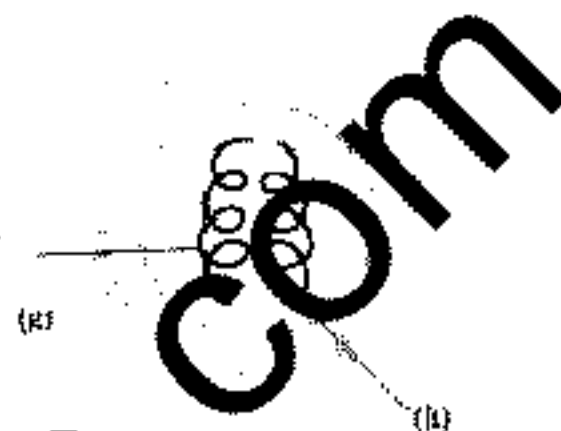
- (iii) Identify the given diagram and label (e) or (f)



- (iv) Identify the given diagram and select suitable example for this diagram out of the given below examples.
Primrose, *Dianthus*, *Hollyhock*, Sunflower, Lemon, Gram.



- (v) Identify the given diagram and also write down its two method of transmission and label (g) or (h) also.



- Sol.** (i) - *Penicillium* / Conidiophore of *Penicillium*
(a) - Ramus
(b) - Phialides / Sterigmata
- (ii) - V.S. of *Pteridium* sporangium / V.S. of fern sporangium
(c) - Annulus
(d) - Stomium
- (iii) **Volvox** colony
(e) - Parent colony
(f) - Daughter colony
- (iv) Free central placentation
Examples - Primrose, *Dianthus*
- (v) Human immunodeficiency virus / HIV
Two methods of transmission - (1) sexual contact (2) blood transfusion
(g) - single - stranded RNA / RNA
(h) - Reverse transcriptase

3. Define the following terms :

- (a) Point mutation
(b) Transcription unit
(c) Germplasm
(d) Biofortification
(e) Adaptation

Sol. (a) **Point mutation** :- Change in a single base pair of DNA is called as a point mutation.

or

Replacement of one nitrogenous base by another nitrogenous base in genetic material.

- (b) **Transcription unit** :- A transcription unit in DNA is defined primarily by the these regions in DNA.
A promoter, structural gene and a terminator.

Germplasm :-

Germplasm is the sum total of all the alleles of the genes, present in a crop and its related species.

- (d) **Biofortification** :- Enhancement of higher levels of vitamins, minerals, higher protein and healthier fats in breeding crops.
- (e) **Adaptation** :- Any attribute of the organism (morphological, physiological and behavioural) that enables the organism to survive and reproduce in its habitat.

4. Fill in the blanks with the suitable word out of the followings :-

Primary, Apical, Intercalary, Lateral, Pond, Tree, Sedge, Xylem, Secondary, phloem, Forest, Desert, Xenogamy, Geitonogamy, Proteins, Mulberry, Castor, Papaya, Phytoplanktons, *Rhodospirillum*, *Chlorella*, *Agrobacterium*, *Gliocladium*, Vacuole, Chloroplast, Cambium, Monoecious, *Anabaena*

- (a) In primary succession, in a the pioneer plants are
- (b) The increase in girth of plants is called growth. Which is caused by the activity of meristem.
- (c) Transport of endodermal cells are control points, where a plant adjust the quality and quantity of solutes reaching the
- (d) Both maize and are monoecious plants. They can prevent autogamy, but not
- (e) Microorganism like species of are used as biopesticides, while those of are used as biofertilizers.

Sol. (a) Pond, phytoplanktons (b) Secondary, lateral (c) Proteins, xylem
(d) Castor, Geitonogamy (e) *Gliocladium*, *Anabaena*

5. Write placentation, inflorescence and type of fruit of the following :

- (a) *Poinsettia* (b) Marigold (c) Onion
(d) Brinjal (e) Radish

S. No.	Placentation	Inflorescence	Fruit
(a)	Axile	Cyathium	Regma
(b)	Basal	Capitulum	Cypsela
(c)	Axile	Scapigerous umbel or cymose umbel	Capsule
(d)	Axile	Cymose	Berry
(e)	Parietal	Raceme / Racemose	Lomentum/Siliqua

6. Match the contents of column-I with column-II

Column-I	Column-II
(A) <i>Usnea</i>	(i) Zoospore
(B) <i>Mucor</i>	(ii) Zygospor
(C) <i>Zea mays</i>	(iii) Vellamen
(D) <i>Equisetum</i>	(iv) Naked seed
(E) <i>Ginkgo biloba</i>	(v) Mutualism
	(vi) Predation
	(vii) Living fossil
	(viii) G.M. crop
	(ix) Rust
	(x) Horse tail
	(xi) Urediniospore
	(xii) Mycobiont
	(xiii) Club moss
	(xiv) Runner
	(xv) Indehiscent fruit
	(xvi) Scutellum

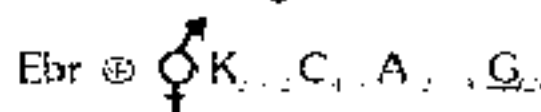
Sol. (A) - (v), (xii) (B) - (ii) (C) - (xv), (xvi) (D) - (x) (E) - (iv) (vii)

7. (i) Write three main reasons for maximum bio-diversity in tropical rain forests.
 (ii) Expand IUCN.
 (iii) What do you mean by sacred grooves, ? name such grooves in Meghalaya., Rajasthan and Madhya Pradesh.
 (iv) When, where and in which country earth summit /world summit was held ?

- Sol.** (i) Three main reasons for maximum bio diversity in tropical rain forests are -
 (1) Tropical latitudes are relatively remained undisturbed for millions of years
 (2) Tropical environments are less seasonal, relatively more constant and predictable.
 (3) More solar energy is available in these areas.
 (ii) International Union of Conservation of nature and Natural resources.
 (iii) These are forest areas protected by tribal communities due to religious Sanctity.
 Meghalaya → Khasi and Jaintia
 Rajasthan → Aravalli hills
 MP → Chanda, Bastar, Sarguja
 (iv) (1) 2002
 (2) Johanesburg
 (3) South Africa

8. (a) Draw the floral diagram, and write floral formula of mustard.
 (b) Write down three properties of genetic code
 (c) Write one difference between El-nino and La-nino effect

Sol. (a)



(Any three)

- (b) (1) Triplet in nature
 (2) Nearly universal
 (3) Unambiguous
 (4) degenerative
 (c) Water of pacific ocean get warm due to hot water current is called El nino effect and water of pacific ocean get cold due to cold water current is called La nino effect.

9. Fill in the blanks with the help of following given words.

[Extinct, North-western, Tropical, Fig, Ficus, Glomus, Northern, Southern, Pinus, Diversity, Ustilago, Rust, Smut, staphylococcus, Flemming, Azospirillum, Paster, Selaginella, Chara

- (a) In(1)..... areas(2)..... acts as keystone species.
(b) The species those are(3)..... in(4)..... parts of India are due to Jhoom cultivation.
(c) Loose(5)..... in wheat is caused by(6).....
(d)(7)..... could not grow on penicillium containing culture. it was first observed by(8).....
(e) Beside *Polytrichum* and(9)..... female sex organ archaegonia are also present in(10).....

Sol.

- [(1) - Tropical
(2) - Fig
(3) - Extinct
(4) - North - Eastern
(5) - Smut
(6) - Ustilago
(7) - Staphylococcus
(8) - Flemming
(9) - *Selaginella*
(10) - *Pinus*

10. How do the following help in transfer, storage and expression of genetic information ?

- (a) Nucleolus
(b) Ribosome
(c) Centriole
(d) Centromere
(e) Chromatin

Sol.

- (a) Nucleolus helps in ribosome formation, which helps in translation.
(b) Ribosome is the site of expression or translation
(c) Centriole helps in spindle arrangement/cell division
(d) Centromere helps in division of chromosome and attachment of spindle fibre
(e) Genetic informations are mainly stored in chromatin/Storage of genetic informations

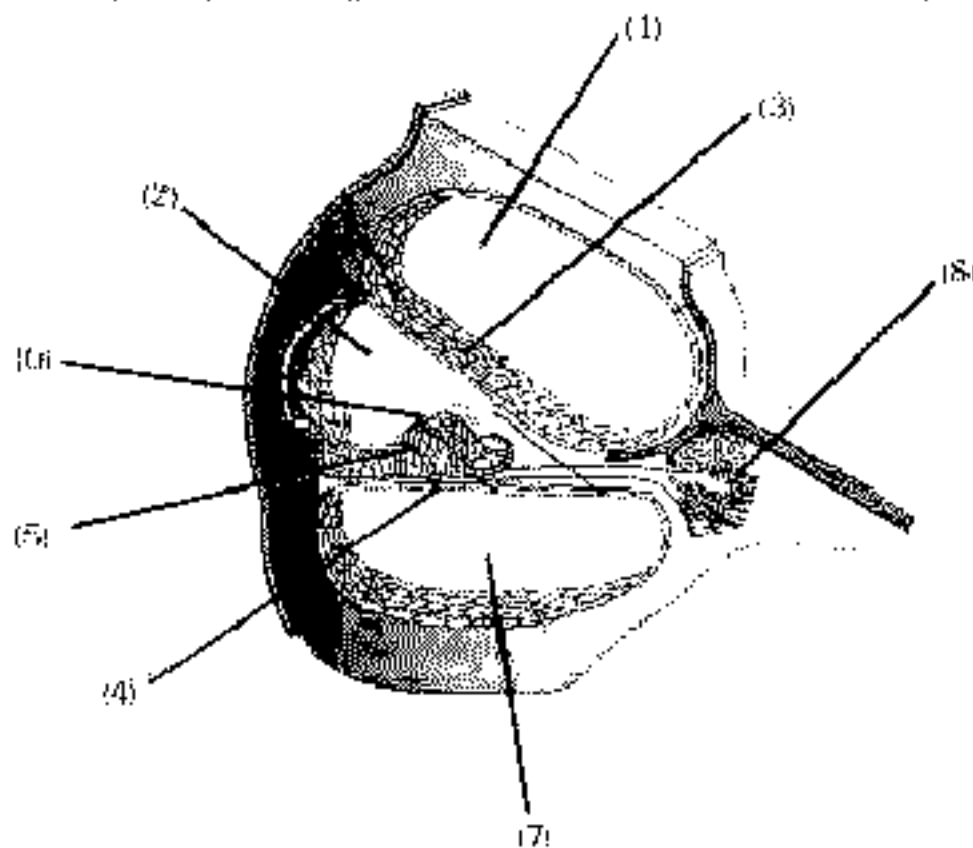
11. Find out the false statements out of the given and correct them by changing only underlined words.

- (a) In garden pea dwarf plants are hybrid and when they are crossed with each other, they produce 50% dwarf plants
(b) Earthworm is hermaphrodite and has true coelome
(c) Enzymes similar in structure and activity are called coenzymes
(d) Nitrogenous waste product in human is uric acid, while urea is in cockroach
(e) At the time of splicing process exons are removed and introns join together.

Sol.

- (a) In garden pea tall plants are hybrid and when they crossed with each other they produce 25% dwarf plants
(c) Enzymes similar in structure and activity are called isoenzyme
(d) Nitrogenous waste product in human is urea, while uric acid is in cockroach
(e) At the time of splicing process introns are removed and exons join together.

12. (a) Identify the given diagram with its location in human body



- (b) Label no. (2) and write down name of fluid present in it.
(c) Label (4), (5) and (6) and how do they help in the functioning of above diagram ?

Sol. (a) Transverse section of cochlea and it is located in coiled part of bony labyrinth

(b) Scala media. it contains endolymph

(c) (4) → basilar membrane

(5) → organ of Corti/hair cells

(6) → Tectorial membrane

They receive waves from lymph and induce a ripple in the basilar membrane. These movements of basilar membrane bend the hair cells (organ of Corti) pressing them against the tectorial membrane. As a result, nerve impulses are generated in the associated afferent neurons. These impulses are transmitted by afferent neurons via auditory nerve to auditory cortex of the brain where impulses are analysed and sound is recognised.

13 (A) What is the genetic basis of each of the given genetic disorders. also give the informations as ask against each of them

(1) Down syndrome - specific feature on palm

(2) Turner's syndrome - Abnormalities in gonads

(3) Klinefelter syndrome - Appearance of opposite sex character

(B) How do man and penguin show convergent evolution ?

(C) Ramapithecus were more ape like, while Dryopithecus were more man like.

Is this statement incorrect then correct it, and rewrite ?

Sol. (A) Genetic basis - Presence of an additional copy of the chromosome number 21 (trisomy of 21)
Palm is broader

(2) Genetic basis - absence of one of the X chromosomes i.e. 44 + XO
Sterile females with rudimentary ovaries.

(3) Genetic basis - due to presence of an additional copy of X-chromosome resulting into a karyotype of 44 + XXY.

Feminine development (development of breast i.e. Gynaecomastia)

(B) Penguins and Dolphins live in similar habitat, that has resulted in selection of similar adaptive features in different groups of organisms/Flippers of penguin and dolphins adapted for the similar function

(C) Ramapithecus were more man like, while Dryopithecus were more ape like.

14. Fill in the blanks by using following words given in bracket. :-
 [CNG, LPG, Butane, Cotton boll worm, Corn borer, Citric acid, Acetic acid, DNA sequences, Nucleotide sequence, Protein, **Agrobacterium**, Restriction endonuclease, Aphid, Cloning **Bacillus**, methane, Bacteria.]
- Aspergillus niger** is used to produce
 - Biofertilizer are obtained from species and biopesticides are obtained from species.
 - are the enzyme used to cut the DNA from specific site.
 - The process of making identical copies of DNA segments is known as
 - The protein encoded by the genes CryIAc and CryIIAb control and Cry I Ab controls.
 - Bio gas mainly contains and used for cooking.

- Sol.
- Citric acid
 - Bacteria, **Bacillus**
 - Restriction endonuclease
 - Cloning
 - Cotton boll worm, corn borer
 - Methane

15. Match the Contents of column-I with those of Column-II

Column-I		Column-II	
(a)	Mutualism	(i)	One species get benefited other neither benefited nor harmed
(b)	ESP (Electrostatic precipitator)	(ii)	Ozone depletion
(c)	Sewage waste	(iii)	Methane
(d)	Montreal protocol	(iv)	SO ₂
(e)	J. Shaped curve	(v)	Phytoplankton growth in river water
		(vi)
		(vii)	Two species get benefited
		(viii)	Zoo
		(ix)	Particulate matter
		(x)	Exponential growth
		(xi)	CFC
		(xii)	orchid branch with mango
		(xiii)	Fish mortality
		(xiv)	Industrial exhaust

- Sol.
- = vii
 - = ix, xiv
 - = v, xiii
 - = ii, iii, xi
 - = vi, x

16. Read the statements to (♦) carefully

- Find out the correct statements.
- Find out the wrong statements and correct them by changing underlined word
 - Skull, Ribs, Sternum and Vertebral column form axial skeleton
 - Conduction of impulse along axon membrane takes place due to repolarization and depolarization waves.
 - Myoglobin present in some muscle gives redish colour.
 - Common hepatic duct is formed by bile duct and pancreatic duct.
 - Amniotic fluid diagnosis is misused in termination of pregnancy.

- Sol.
- Correct
 - Wrong
Correct-conduction of impulses along with axon membrane take place due to depolarization and repolarization waves.
 - Correct
 - Wrong
Correct-Common hepatic duct is formed by right hepatic duct and left hepatic duct.
 - Wrong
Correct-Amniotic fluid diagnosis is misused in determination of sex of child.

17. Match the column and answer the questions given below

Column-I	Column-II	Column-III
(i) Nereis , Earthworm, Pila , Leech	Bilateral, Metamerism	Phylum
(ii) Shark ; Whale ; Dolphin ; Bat	Bony endoskeleton, vivipary	Chambers of heart
(iii) Ostrich ; Lizard ; Peacock ; Duck billed Platypus	homeothermy oviparous	Nourishment to young ones
(iv) Starfish ; Sea anemone ; Sea Cucumber ; Sea urchin	Radial symmetry, Dorsal hollow nervous system	Level of organisation

(a) Which characters of column-II are common among the animals of column-I ?

(b) Which characters of column-II are mismatched in column-I and how these characters are mismatched.

Sol.

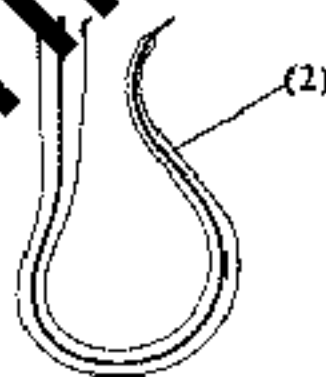
- (a) (1) Bilateral
(2) Vivipary
(3) Ovipary
(4) Radial symmetry

- (b) (i) **Pila** → Because, it belongs to mollusca phylum
(ii) **Shark** → Because, it contains two chambered heart
(iii) Duck billed platypus → Because, it is breast feeding mammals!
(iv) **Sea anemone** → Because, it has tissue grade level of organisation.

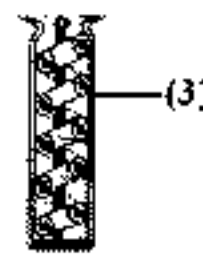
18.



(A)



(B)



(C)

- (a) Write the correct sequence of above diagrams (A), (B) and (C).
(b) Label part (1) in diagram A and write the function of part (1).
(c) Label part (2) in diagram B and write the function of part (2).
(d) Label part (3) in diagram C and write the function of part (3).
(i) What is the correct place of fertilisation in female reproductive system ?
(ii) At which stage implantation takes place ?

Sol.

Correct sequence is A - C - B

(1) Acrosome of sperm.

It's main function :- The enzymes present in the acrosome helps in fertilization by helping in dissolution/penetration of egg membranes.

(c) (2) Tail of sperm, it helps in the swimming of sperm/facilitates the motility of sperm

(d) (i) (3) Middle piece of sperm containing mitochondria. These mitochondria produce energy for the movement of tail.

(ii) Ampullary isthmic junction/Ampulla of fallopian tube.

(iii) Blastula stage / Blastocyst

19. (1) Match the contents of column-I with those of column-II :

Column-I	Column-II
(a) Erythropoietin	(i) Collateral glands
(b) Smooth muscle fibres	(ii) Typhlosole
(c) Cockroach	(iii) Involuntary
(d) <u>Petromyzon</u>	(iv) Gizzard
	(v) Hormone
	(vi) Radulla
	(vii) Juxtaglomerular cells
	(viii) Circular mouth
	(ix) Fusiform
	(x) Wall of blood vessels
	(xi) Choanocytes

(2) For column I, in column II some terms are not matching. Write the name of any one with its phylum.

Sol. (1) (a) - v, vii (b) iii, ix, x (c) i, iv (d) viii

(2) Typhlosole - Annelida
Radulla - Mollusca
Choanocytes - Porifera

20. Match the contents of column-I with column-II:-

Column-I	Column-II
(a) Bacterial disease in cattles	(i) Rinderpest
(b) Fresh water fishes	(ii) Rohu
(c) Water born disease in human	(iii) Catla
(d) Parasitic protozoan	(iv) <u>Plasmodium</u>
(e) Important toxicant in water	(v) <u>Paramecium</u>
	(vi) Cholera
	(vii) Anthrax
	(viii) Cowpox
	(ix) Sardine
	(x) Malaria
	(xi) Arsenic
	(xii) Copper

(a) → (vii) (b) → (ii), (iii) (c) → (vi) (d) → (iv) (e) → (xi)