Solved Paper **CBSE-PMT '09**

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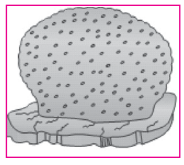
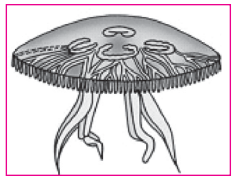
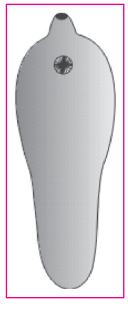
Veri-Similar Practice Paper-1

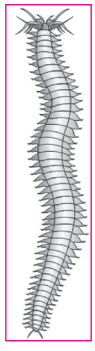
–Prof. Siddharth Sanghvi

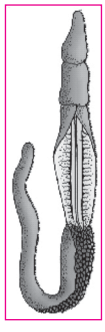
1. Identify the following organisms (A, B, C, D, E) and phylum from which they belongs

(A) 

(B) 

(C) 

(D) 

(E) 

2. Write the word or phrase that best completes each statement or answers the question

(a) Long, thin, tapered cells with lignified cell walls that function in support and permit water flow through pits ..... .

(b) Living cells that lack nuclei and ribosomes; they transport sucrose and other organic nutrients ..... .

(c) The least specialized plant cells, which serve general metabolic, synthetic, and storage functions ..... .

(d) Cells with unevenly thickened primary walls that support young parts of the plant ..... .

(e) Mature cells without protoplasts but with thick, lignified secondary walls that may form fibers ..... .

3. Select true and false statements. Rectify false statements.

(a) Gametophyte of *Funaria* is monoecious and autoecious.

(b) Eastern Himalayas are considered to be gold mines of liverworts.

(c) In algae asexual reproduction is by the production of different types of spores, the most common being the zoospores.

(d) Isomorphic alternation of generation present in *Selaginella*.

(e) Rossette habit in liverworts/*Riccia* is due to repeated dichotomous branching.

(f) Retort cells are larger empty cells of cortex of stem near the leaf bases in *Sphagnum* (peat or bog moss). These are flask shaped.

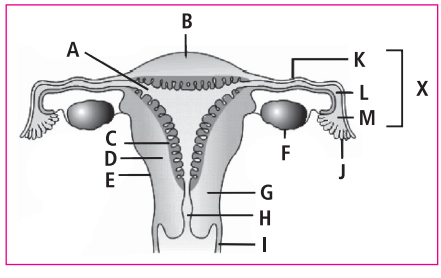
(g) The sequence of cells in archegonium from upper to lower side is lid cells – venter canal cells – neck canal cell – egg cell.

(h) Thallus of *Anthoceros* shows symbiotic association with a nitrogen fixing blue green alga-*Nostoc* which lives in schizogenous mucilage ducts and mucilage cavities of thallus as endophyte.

(i) Bog moss *(Sphagnum)* is a false mass.

(j) In *Cycas* microspore is shed at 3-cell stage.

4. Give the answers of following questions



(a) The cavity of the G known as H along with I forms the birth canal. Identify structure G, H and I.

(b) Write the name of supportive structures which are extended from B to F and gives support to structure F

(c) The edges of the structure M possess finger-like projections J, which help in collection of the ovum after ovulation. Identify structure M and J ?

(d) Write the nature of C, D, E layers

(e) There are X and Y zone, two divisions of C, X is closest to A and Y is adjacent to D. Write the name of X and Y zone?

5. Fill in the blanks

A soil bacterium .....(1)..... produces a crystal protein. The crystal protein is toxic to larvae of certain insects. The gene encoding crystal protein is .....(2)..... gene. There are a number of them, for example, the proteins encoded by the genes .....(3a)..... and .....(3b)..... control the cotton bollworms, and gene .....(3c)..... controls corn borer. This toxin protein exist as

inactive protoxins but once an insect ingest the inactive toxin, it is converted into an active form of toxin due to the .....(4)..... pH of the gut which solubilise the crystals.The activated toxin binds to the surface of .....(5)..... cell of mid gut and create pores that cause cell swelling and lysis and eventually cause death of the insect.

6. Match the column A with column B

Column A		Column B	
1.	dodo	a.	extinctions from Russia
2.	quagga	b.	extinctions from Australia
3.	thylacine	c.	extinctions from Mauritius
4.	Steller's Sea cow	d.	extinctions from Africa
5.	Bali,Javan,Caspian	e.	extinct subspecies of tiger

7. Give the answers of following questions

(a) Write the name of structure/center-X which is primarily responsible for this regulation of respiration

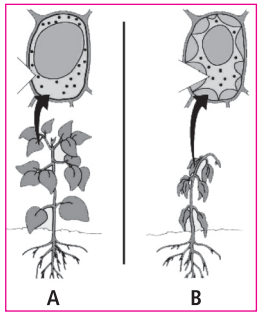
(b) Write the name of another centre present in the pons region of the brain which can moderate the functions of the x center?

(c) Write the name of center/area which is highly sensitive to CO_2 and hydrogen ions.

(d) Where the receptors to sense changes in CO_2 and H^+ concentration are presents?

(e) What is Hering-Breuer reflex?

8. This diagram illustrates the concept of wilting caused as overall water deficit form in the plant. Refer to this for the following questions



(a) When the plant goes from water status A to water status B, it is said to have lost:

(b) Which side would the leaves (leaf cells) have a more positive ψ_w ?

(c) Which side would the leaf cells have a more positive ψ_s ?

(d) Which side would the leaf cells have a more positive ψ_p ?

(e) Which side would you expect the soil to have a more positive ψ_w ?

9. Give the perfect name to following branch of science/ statements/events/methods

(a) The first mode of action of antibiotics in which antibiotics destroys the microbial cells while in the second method antibiotics inhibits the growth of bacteria.

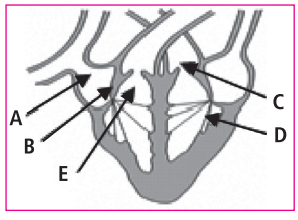
(b) The science of analysing different proteins and locating them in cells and identifying their respective genes, which encode them in the cells is known as ..... .

(c) Branch of science deals with the creation and maintenance of databases of biological information such as the nucleic acid, gene sequences and protein sequences. It involves the data analysis or creation of electronic databases on genomes and protein molecules is called ..... .

(d) Method involves the replacement of corrective genes in place of defective genes in human.

(e) In genetic engineering, the uptake of genes by the cells in animals is called ..... .

10. The diagram shows a vertical section through a mammalian heart.



(I) Mention the position of followings in given heart diagram

(a) Coronary artery (origin)

(b) AV node

(c) Coronary sinus

(d) Chordae tendineae

(II) Where the blood carrying little oxygen enters the heart and where it leaves the heart ?

(III) The walls of the left and right ventricles have different functions

11. Match the column A with column B

Column A		Column B	
1.	Derivatives of tyrosine	a.	Atrial natriuretic
2.	Derivatives of tryptophan	b.	Androgen
3.	Eicosanoids	c.	Prostaglandin
4.	Derivatives of steroids	d.	Dopamine
5.	Peptide hormone	e.	Estrogen
		f.	Melatonin
		g.	Epinephrine
		h.	Thyroxine

12. Fill the correct answer in blank place from given box

Rhodobacter, Azotobacter, Frankia, Klebsiella, Clostridium

(A) Free living nitrogen fixing bacteria:

(a) Obligate anaerobes .....

(b) Facultative anaerobes .....

(c) Photosynthetic bacteria .....

(d) Obligate aerobes .....

(B) Symbiotic nitrogen fixing bacteria .....

13. Define/differentiate/describe/followings

(a) Stenothermal and Eurythermal

(b) Anadromous fish and Catadromous fish

(c) Batesian and Mullerian mimicry

(d) Standing crop

(e) Bergmann's rule

14. Give the answers of following questions on the basis of given description

A scientist develops *in vitro* culture of foetal cells (from amniotic fluid) with phytohaemagglutinin. The foetal cells are cultured with colchicine. When these cells are placed in hypotonic solution, the cells become turgid or swelled. The water diffuses into the cell and separates the chromosomes. After that he put the chromosome on a slide, after staining he took a photograph of them.

(a) What actually scientist doing in this experiment?

(b) What is the role of phytohaemagglutinin in this experiment?

(c) What is the use of colchicines in this experiment?

(d) Scientist wants to give a name to photograph of chromosome. What would be the most probable name you want to suggest to scientist?

(e) According to Denver system of classification human chromosome number 12 present in which group ?

15. Match the columns

Column A		Column B	
1.	Fibrous joints	a.	the bones involved are joined together with the help of cartilages
2.	First class lever	b.	between the adjacent vertebrae.
3.	Cartilaginous joints	c.	presence of a fluid filled cavity between the articulating surfaces of the two bones
4.	Synovial joints	d.	it permits limited movements.
5.	Second class lever	e.	do not allow any movement
		f.	flat skull bones which fuse end-to-end with the help of these type of joint and form sutures
		g.	considerable movement
		h.	fulcrum in the middle
		i	resistance is in the middle.

16. Fill in the blank

(a) A typical angiosperm anther is ..... with each lobe having ..... theca, *i.e.*, they are ..... .

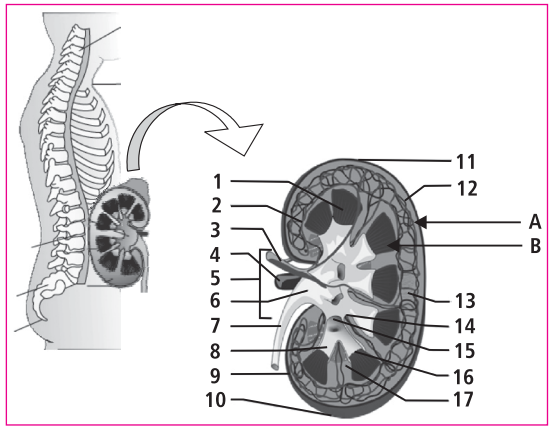
(b) When the anther is young, a group of compactly arranged homogenous cells called the ..... occupies the centre of each microsporangium. As each cell of the this part is capable of giving rise to a microspore tetrad. The process of formation of microspores from a pollen mother cell through meiosis is called ..... .

(c) Pollen grains have a prominent two-layered wall. The hard outer layer called the ..... which is made up of ..... (one of the most resistant organic material known). Pollen grain outer layer has prominent apertures called ..... .

(d) The inner wall of the pollen grain is called the ..... It is a thin and continuous layer made up of ..... .

(e) When the pollen grain is mature it contains two cells, the .....(1)..... cell and .....(2)..... cell. The .....(1)..... cell is bigger, has abundant food reserve and a large irregularly shaped nucleus. The .....(2)..... cell is small and floats in the cytoplasm of the .....(1)..... cell. In over 60 per cent of angiosperms, pollen grains are shed at this ..... celled stage.

17. Give the answers of following questions with the help of given diagrams



(a) Mention the colour, size, weight and position (with reference to vertebrae) of human kidney

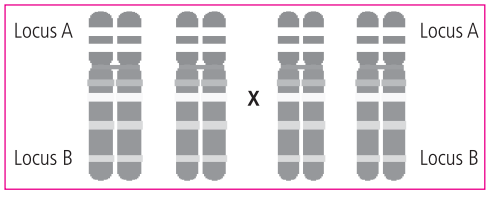
(b) Mention the positional asymmetry of kidney within the abdominal cavity and its due to .....

(c) The Malpighian corpuscle, PCT and DCT of the nephron are situated in the region .....? (Select from A or B)

(d) Which type of nephrons does not have vasa recta ?

(e) Identify structure 1, 3 and 7 in diagram

18. Diagram representing a particular autosomal chromosome pair (for a Couple) with two non linked gene locus A and B .Find out the expected F_2 generation phenotypic ratio in following crosses ?



Cross 1. Dominant-recessive relationships in dihybrid parents at locus A X dominant-recessive relationships in dihybrid parents at locus B
Cross 2. Dominant-recessive relationships in dihybrid parents at locus A X codominant relationships in dihybrid parents at Locus B
Cross 3. Codominant relationships in dihybrid parents at locus A X codominant relationships in dihybrid parents at locus B
Cross 4. Dominant-recessive relationships in dihybrid parents at locus A X codominant lethal relationships in dihybrid parents at locus B
Cross 5. Codominant relationships in dihybrid parents at locus A X codominant lethal relationships in dihybrid parents at locus B

19. Match the column A with B

Column A		Column B	
1.	Deuteromycetes	a.	*Agaricus*
2.	Basideomycetes	b.	*Phytopthora*
3.	Ascomycetes	c.	*Heliminthosporium oryzae*
4.	Zygomycetes	d.	*Peziza*
5.	Phycomycetes	e.	*Claviceps*
		f.	*Puccinia graminis tritici*
		g.	*Penicilium*
		h.	*Cyathus*
		i	*Aspergillus*
		j.	*Albugo*
		k.	*Neurospora*
		l.	*Ascobolus*
		m.	*Amanita*
		n.	*Fusarium monaliformis*
		o.	*Rhizopus*
		p.	*Epidermophyton*
		q.	*Altarnaria solani*

20. Define or differentiate followings
(a) Mass selection and its one disadvantage
(b) Pure line selection and its one disadvantage
(c) Clonal selection
(d) Heterosis or hybrid vigour
(e) Inbreeding and its consequences

ANSWER

1. A – *Euspongia*, Phylum-Porifera
B – *Aurelia* (Medusa), Phylum-Coelenterata (Cnidaria)
C – *Fasciola* Phylum – Platyhelminthes
D – *Nereis*, Phylum – Annelida
E – *Balanoglossus*, Phylum – Hemichordata

2. (a) tracheids (b) sieve-tube cells
(c) parenchyma (d) collenchyma
(d) sclerenchyma

3. (a) Autoecious (b) Western
(c) True (d) Heteromorphic
(e) True (f) True
(g) The sequence of cells in archegonium from upper to lower side is lid cells- neck canal cells-venter canal cell-egg.
(h) True (i) True mass.
(j) True

4. (a) G-cervix, H-cervical canal, I- vagina
(b) Mesovarium, ovarian ligament, broad ligament all extends from uterus(B) to ovary(F)
(c) M-infundibulum/J-fimbriae,
(d) C-glandular
D – smooth muscle E – thin membranous,
(e) X-functional zone:layer closest to uterine cavity (A) and Y-basilar zone:adjacent to myometrium (D)

5. 1. *Bacillus thuringiensis*
2. cry
3a-cryIAc, 3b, cryIIAb, 3c, cryIAb
4. alkaline
5. epithelial

6. 1 – c; 2 – d; 3 – b; 4 – a; 5 – e

7. (a) Respiratory rhythm centre
(b) Pneumotaxic centre
(c) Chemosensitive area
(d) Aortic arch and carotid artery.
(e) Inflation reflex (Hering-Breuer reflex) – occurs when lung tissues are stretched: It helps regulate the depth of breathing: It reduces the duration of inspiratory movements: It prevents over inflation of the lungs during forceful breathing

8. (a) Turgidity (b) A
(c) A – because as cells in B loose water, the same amount of solutes remain, causing the osmolality of the cell sap to increase.
(d) A – because(B) has lost most of its cell pressure, and hence p would be far lower than (A).
(e) A – plants that wilt are having trouble replacing water lost via transpiration from the soil ..... this means the soil ψ_w is more negative in B.

9. (a) First-bactericidal, second-bacteriostatic
(b) Proteomics (c) Bioinformatics
(d) Gene therapy (e) Transfection.

10. I – 1 – C, 2 – B, 3 – A, 4 – D

II. Enter-A, leave-E

III. Left ventricle pump blood to whole body/all organ/all organ system or In right ventricle less pressure than left ventricle

11. 1 – d, g, h ; 2 – f, ; 3 – c ; 4 – b, e ; 5 – a

12. *Clostridium, Klebsiella, Rhodobacter, Azotobacter, Frankia*

13. (a) Stenothermal organisms live in areas where temperature remains nearly uniform throughout the year. on the other hand eurythermal organisms can tolerate large scale variations in temperature. They live in areas where there are different temperatures at different times of the year.

(b) Anadromous fish live in the sea mostly, breed in fresh water (Greek: '*Ana*' is up; The noun is "anadromy") Catadromous fish live in fresh water, breed in the sea (Greek: '*Cata*' is down)

(c) (i) Batesian mimicry – The mimic is defenseless. It has, however, resemblance to a dangerous or unpalatable model so that the predator usually does not prey upon it, *e.g.*, Viceroy Butterfly mimics unpalatable toxic Monarch Butterfly.

(ii) Mullerian mimicry – It is resemblance to two animal species, especially insects, both unpalatable/ferocious, to their mutual benefit, *e.g.*, Monarch Butterfly and Queen Butter-fly

(d) Each trophic level has a certain mass of living material at a particular time called as the standing crop. The standing crop is measured as the mass of living organisms (biomass) or the number in a unit area. The biomass of a species is expressed in terms of fresh or dry weight.

(e) The rule known as Bergmann's Rule asserts that within a species, the body mass increases with latitude and colder climate.

14. (a) Karyotyping (b) It induces mitosis

(c) Colchicine stops mitosis at metaphase.

(d) Idiogram (e) Group-C

15. 1 – e, f ; 2 – h ; 3 – a, b, d ; 4 – c, g ; 5 – i

16. (a) Bilobed ,two theca, dithecous

(b) sporogenous tissue, Microsporogenesis

(c) Exine, Sporopollenin, germ pores

(d) Intine, cellulose and pectin.

(e) The vegetative cell 2-Generative cell, 2-celled

17. (a) Kidneys are reddish brown, bean shaped structures situated between the levels of last thoracic and third lumbar vertebra close to the dorsal inner wall of the abdominal cavity. Each kidney of an adult human measures 10-12 cm in length.

(b) The asymmetry within the abdominal cavity caused by the liver results in the right kidney being slightly lower than the left one while the left kidney is located slightly more medial.

(c) A

(d) Vasa recta is absent or highly reduced in cortical nephrons.

(e) 1 – Renal pyramid, 3 – Renal artery, 7 – Ureter

18. 1. 9 : 3 : 3 : 1

2. 3 : 6 : 3 : 1 : 2 : 1

3. 1 : 2 : 1: 2 : 4 : 2 : 1 : 2 : 1

4. 3 : 1: 6 : 2

5. 1 : 2 : 1 : 2 : 4 : 2

19. 1 – c, n, p, q, 2 – a, f, h, m,

3 – d, e, g, l, k, l, 4 – o,

5 – b, j, o

20. (a) Mass selection – In this method, plants are selected based on their desirable morphological characters (phenotype). Their seeds are composite or mixed and the progenies are grown in masses. They are not individually tested. After repeated selection for about five to six years, selected seeds are multiplied and distributed to farmers. The only disadvantage of mass selection is that it is difficult to distinguish hereditary variation from environmental variation.

(b) Pure line selection – A pure line is a collection of plants obtained as a result of repeated self-pollination from a single homozygous individual. Hence, a variety formed by this method shows more homozygosity with respect to all genes. One disadvantage is that new genotypes are never created by this method. Genetic variability is essential for adaptations in different environmental and seasonal conditions.

(c) Clonal selection – Crops like sugarcane, potato, tea, banana and certain species of grasses are asexually propagated and produce very poor seeds. Based on their phenotypic appearance, the method of clonal selection is employed to select improved variety from a mixed population (clones). Selected plants are multiplied through vegetative propagation to give rise to a clone. The genotype of a clone remains unchanged for a long period of time.

(d) The superiority of the F_1 hybrid in performance over its parents is called heterosis or hybrid vigour. Vigour refers to increase in growth, yield, resistance to diseases, pests and drought.

(e) When two individuals of the same species are crossed, it is called inbreeding or selfing or self-pollination. This results in the increase of homozygosity. Particularly homozygous recessive alleles develop loss of vigor in plants.

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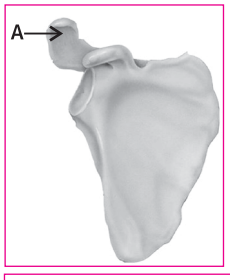
Veri-Similar Practice Paper-2

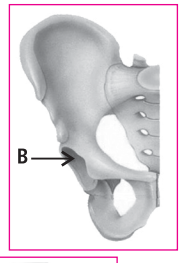
–Prof. Siddharth Sanghvi

1. Identify the following bones of humans (a, b, c, d, e) and parts (A, B, C, D, E) associated with them?

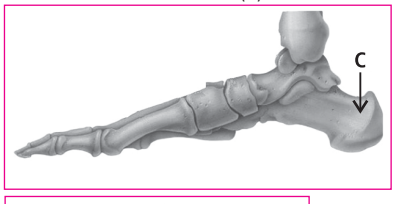
(a)



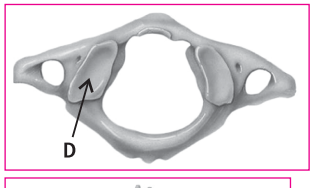
(b)



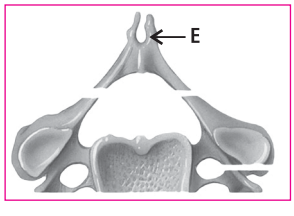
(c)



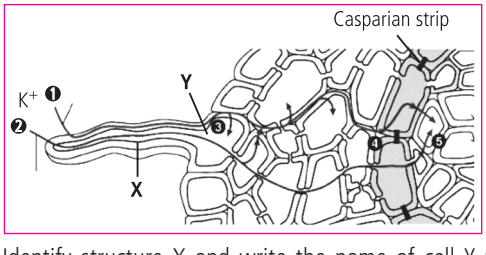
(d)



(e)



2. Give the answers of following questions on the basis of given diagram



(a) Identify structure X and write the name of cell Y from which structure X originated ?

(b) Write the name of cell layer on which casparian strip is deposited and also write the composition of casparian stripe

(c) Pathway number 2 above shows a K^+ ion being taken into structure X and then flowing from cell to cell and ultimately into the xylem. What is the term for the route illustrated as pathway number 2?

(d) As diagrammed, K^+ flows from cell to cell through what structure?

(e) Pathway number 1 above shows a K^+ ion entering a root and flowing to the endodermis. What is the term for this route of mineral uptake in roots as illustrated in 1 above?

3. Fill in the blanks

(a) The most dramatic examples of habitat loss come from tropical rain forests. Once covering more than ..... per cent of the earth's land surface, these rain forests now cover no more than ..... per cent.

(b) The Amazon rain forest is so huge that it is called the ..... . They are harbouring probably millions of species is being cut and cleared for cultivating ..... or for conversion to grasslands for raising ..... .

(c) The branch of river ..... introduced into Lake Victoria in East Africa led eventually to the extinction of an ecologically unique assemblage of more than 200 species of ..... fish in the lake.

(d) Like carrot grass (*Parthenium*), *Lantana* and water hyacinth (*Eichhornia*),the recent illegal introduction of the African catfish named ..... for aquaculture purposes is posing a threat to the indigenous catfishes in our rivers.

(e) Initially ..... biodiversity hotspots were identified but subsequently nine more have been added to the list,bringing the total number of biodiversity hotspots in the world to ..... .

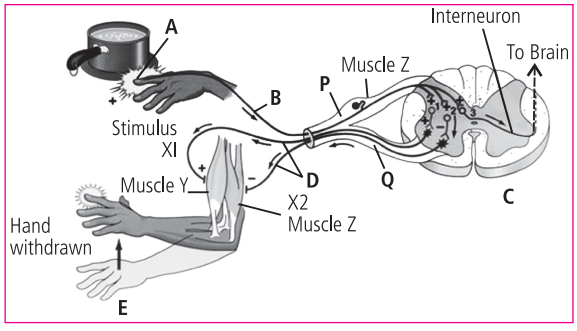
4. Fill in the blanks

(a) Every 100 ml of oxygenated blood can deliver around ..... ml of O_2 to the tissues under normal physiological conditions.

(b) Every 100 ml of deoxygenated blood delivers approximately ..... ml of CO_2 to the alveoli.

(c) Blood is the medium of transport for O_2 and CO_2. About ..... per cent of O_2 is transported by RBCs in the blood. The remaining ..... per cent of O_2 is carried in a dissolved state through the plasma.
(d) Nearly ..... per cent of CO_2 is transported by RBCs whereas ..... per cent of it is carried as bicarbonate. About ..... per cent of CO_2 is carried in a dissolved state through plasma.
(e) A ..... curve is obtained when percentage saturation of haemoglobin with O_2 is plotted against the ..... .

5. The diagram shows the parts of the nervous system which act when the hand touches a hot object. Give the answers of following questions.



(a) Structure A, B, C, D, E representing ..... respectively
(b) What happens to muscle Y when impulses arrive at point X1?
(c) What happens to muscle Z when impulses arrive at point X2?
(d) Which part from P or Q known as dorsal root?
(e) Moving the hand away from the hot object is a reflex action. What is a reflex action?

6. Match the column A with column B

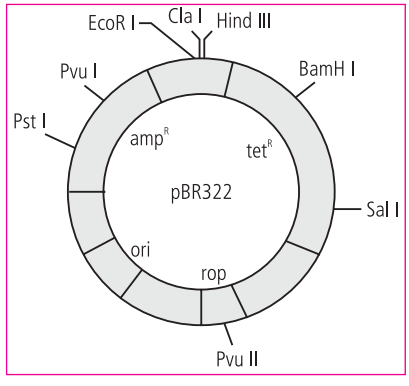
S. No.	Column A	Column B	
1.	Porifera	(a)	With false coelom
2.	Coelenterata	(b)	With true coelom
3.	Platyhelminthes	(c)	Radial symmetry
4.	Aschelminthes	(d)	Without body cavity
5.	Annelida	(e)	Cellular level of organization

7. Select the true and false statements
(a) Whales, bats, cheetah and human (all mammals) share similarities in the pattern of bones of forelimbs.
(b) The same structure developed along different directions due to adaptions to different needs. This is convergent evolution and these structures are analogous.
(c) Analogy indicates common ancestry.
(d) Vertebrate hearts and brains are the examples of analogy.
(e) In plants,the thorn and tendrils of *Bougainvillea* and *Cucurbita* represent homology.
(f) Homology is based on divergent evolution.
(g) Homologous structures are a result of convergent evolution.
(h) Examples of analogy are the eye of the octopus and of mammals.
(i) Flippers of penguins and dolphins are examples of homology.
(j) Sweet potato (root modification) and potato (stem modification) is example for homology.

8. Given table representing important plant products and their resources as well as their human uses. Fill the blank information with the help of other two information of respective query (Any-10)

No.	Product	Plant source	Human uses
(a)	Artemisin	*Artemisia* spp.	.....
(b)	.....	*Azadirachta indica*	Insecticidal
(c)	Berberine	.....	Antibacterial, Anti-inflammatory
(d)	.....	*Capsicum annuum* (chilli)	Reumatic pain treatment
(e)	Codeine	.....	Analgesic
(f)	Digoxin	*Digitalis lanata*	.....
(g)	Diosgenin	.....	Anti-fertility
(h)	.....	*Datura stramonium*	Anti-hypertensive
(i)	Quinine	.....	Anti-malarial
(j)	Shikonin	.....	Antimicrobial, Red pigment used in lipstics & dye for silk
(k)	.....	*Taxus* spp.	Anti-carcinogenic
(l)	.....	*Cathranthus roseus*	Anti-carcinogenic

9. Given diagram representing pBR322. Give the answers of following question on the basis of given diagram and your knowledge?



(a) What is pBR322 ? and pBR denotes for ..... .
(b) What is insertional inactivation
(c) Mention the complete name and recognition sequence for BamH I

(d) rop gene codes for ..... .

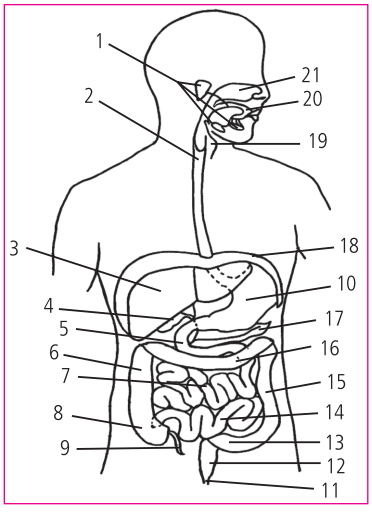
(e) If DNA is cloned into the BamHI site in the Tet^r gene. than draw a replica plating conformation experiment for Transformants

10. Fill in the blanks

Aspergillus is a member of ascomycetes. It is most commonly contaminates cultures in the laboratory and hence called ..... . A. flavus (called ..... . of plant kingdom) grows on stored cereal grains, groundnut and area nuts produce a carcinogenic toxin called ..... . Most of the species are saprophytic and grow on dead organic matter.

..... is a saprophyte but also causes pulmonary aspergillosis and ear infection (otomycosis) in man. ..... . is exploited in the production of citric acid and oxalic acid from molasses .

11. Select the labelled number from diagram for the statements/ items mentioned below.



(a) Rugal folds present here.

(b) Lies in right hypochondriac and epigastric regions and extends to left hypochondriac and umbilical regions.

(c) Origin of duct of Wirsung

(d) Chyle is a milky fluid (bodily fluid) consisting of lymph and emulsified fats, or free fatty acids (FFAs). It is formed here.

(e) It is a slender, hollow appendage (about 9 cm long), dominated by lymphoid nodules (a lymphoid organ) If infected, it results in general abdominal infection (peritonitis).

12. Select true and false statements.

(a) Various leguminous plants like *Crotalaria juncea*, *Cassia mimusoides*, *Glycine max*, *Indigofera linifolia*, *Sesbania rostrata*, *Acacia nilotica*, *Leucena*, *Lathyrus* and *Mucuna* are used as green manures.

(b) Leguminous plants accumulate more than 80 Kg of nitrogen per hectare in the soil when grown as green manures.

(c) *Azolla* is an aquatic fern, which contains an endophytic cyanobacterium *Anabaena azollae* in its leaves. It is used as a biofertilizer in rice field.

(d) Out of six species of *Azolla*, A. *pinnata* is widely employed as a successful biofertilizer in Indian rice fields. It adds 30 Kg of nitrogen per hectare.

(e) A triploid condition in sugar beats, apples and pear has resulted in the increase in vigour and fruit size, large root size, large leaves, flower, more seeds and sugar content in them.

13. Fill in the blanks.

(a) A weed ..... commonly called mouse-eared cress has been engineered to produce a biodegradable plastic known as ..... in tissue granules.

(b) In 1979, for the first time , an Indian born American scientist named ..... developed a strain of ..... that contained a hybrid plasmid that was capable of metabolizing hydrocarbons(crude oil).

(c) A Plasmid which was capable of metabolizing hydrocarbons(crude oil) is derived by combining parts of plasmid. ..... X ..... and ..... Y ..... are the plasmids which contain the genes responsible for the decomposition of the hydrocarbons like camphor and octane respectively present in the oil.

(d) Rice with saline tolerance and pest resistance is ..... .

(e) Pyrethrum extracted from the inflorescence of ..... belonging to Asteraceae.

14. Match the numbered antibiotic with its effect

Antibiotics		Effect	
(I)	Tetracyclines	(a)	inhibits binding of amino-acyl t-RNA to ribosome
(II)	Streptomycin	(b)	inhibits initiation of translation and causes misreading
(III)	Chloramphenicol	(c)	inhibits peptidyl transferase and so formation of peptide bonds
(IV)	Erythromycin	(d)	inhibits translocation of m-RNA along ribosome
(v)	Neomycin	(e)	inhibits interaction between t-RNA and m-RNA

15. Describe following.

(a) Asthma

(b) Emphysema

(c) Occupational Respiratory Disorders

(d) Haldane effect

(e) Bohr effect

16. Fill the appropriate options(a-m) from given box to skeletal, smooth and cardiac muscle for the following features.

	Features	Options	Skeletal muscle X	Cardiac Muscle Y	Smooth Muscle Z
1.	Muscle fiber shape	(a) Cylindrical (b) Branched (c) Fusiform	Fill here	Fill here	Fill here
2.	Nerve endings	(d) Motor end plate (e) Varicosities	Fill here	Fill here	Fill here
3.	Mitochondria	(f) Few (g) Many (h) Less	Fill here	Fill here	Fill here
4.	Sarcomere	(i) Regular (j) Absent	Fill here	Fill here	Fill here
5.	Ca^{++} binding protein	(k) Troponin (l) Calmodulin	Fill here	Fill here	Fill here

17. Match the columns

	Column A		Column B
1.	PCT	(a)	simple cuboidal brush border epithelium
2.	Descending limb of loop of Henle	(b)	selective secretion of hydrogen ions, ammonia and potassium ions into the filtrate and by absorption of HCO_3
3.	Collecting duct	(c)	filtrate gets diluted
4.	Ascending limb	(d)	the filtrate gets concentrates
5.	DCT	(e)	permeable to water but almost impermeable to electrolytes.
		(f)	impermeable to water but allows transport of electrolytes actively or passively.
		(g)	70-80 per cent of electrolytes and water are reabsorbed
		(h)	conditional reabsorption of Na^+ and water
		(i)	reabsorption of HCO_3
		(j)	large amounts of water could be reabsorbed from this region to produce a concentrated urine.

18. Given the answers of followings questions on the basis of given diagrams

(a) Given diagrams A & B representing ..... respectively

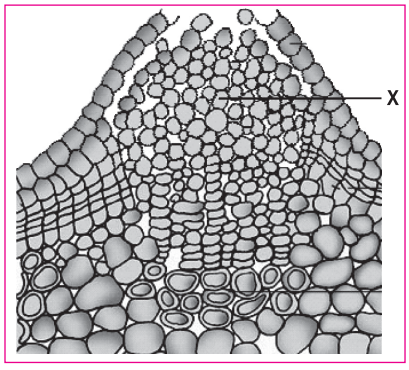
(b) Write the name and nature of structure X & Y

(c) Write the total number of proto-filaments involved in diagram B.

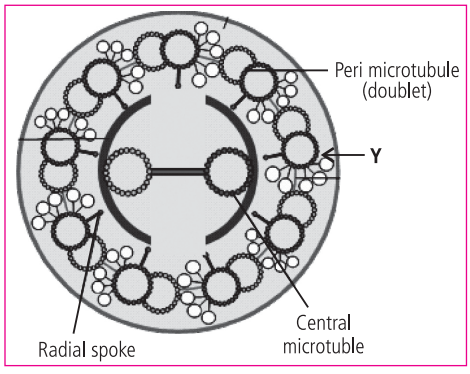
(d) Structure X is a cytological derivation of ..... .

(e) Mention the name of another structure which is similar to structure A in regulation of opening and closing

(A)



(B)



19. Column A representing examples. Fill in the Column B- about anomalous primary structures.

S. No.	Column A	Column B- anomalous primary structures
1.	Wheat, barley, rice	(a)
2.	*Tamus*, *Asparagus*.	(b)
3.	*Peperomia*, *Anemone*	(c)
4.	*Nyctanthes*, *Casuarina*	(d)
5.	Potato, *Calotropis*.	(e)

20. (A) Give the answers of following question :

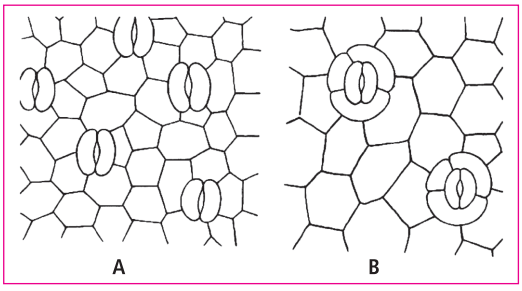
(a) In the light reactions of photosynthesis, oxygen is evolved. From what molecule is oxygen derived? From which process, and in what precise location, does this occur

(b) Imagine that a C_3 plant and a C_4 plant of the same age and biomass share a sealed glass container at 25°C. Both receive adequate light, water and nutrients. What will happen to the two plants over time? What if the container was not sealed and the temperature was 10°C?

(c) In attempts to increase photosynthetic yield, genetic engineers have created plants which "overexpress" the enzyme rubisco. This means that the plants make much more rubisco than they normally would. However, the

engineered plants have been a disappointment, since their photosynthetic rates are not boosted by the extra Rubisco. From what you know about rubisco and limits to photosynthesis, can you explain these results?

(B) Diagram A & B representing types of stomata on the basis of no. and orientation of subsidiary cells. Identify them.



ANSWERS

1. (a) – scapula, A-acromion process
(b) – Part of pelvic girdle/or coxal bone, B-acetabulum
(c) – foot Bones, C-calcaneus
(d) – Atlas, D-Facets for articulation with occipital condyle
(e) – Cervical vertebra, E-bifid spinous process

2. (a) X-Root hair, Y-Trichoblast
(b) Endodermis, Lignin and suberin
(c) The symplastic route
(d) Plasmodesmata
(e) The apoplastic route

3. (a) 14 percent, 6 percent
(b) lungs of the planet', soya beans, beef cattle
(c) Nile, cichlid fish
(d) *Clarias gariepinus*
(e) 25, 34.

4. (a) 5 ml (b) 4 ml
(c) 97, 3 (d) 20-25, 70, 7
(e) sigmoid, pO_2.

5. (a) A – The receptor B – The sensory neuron
C – Integrating center D – the motor neuron
E – Effector organ
(b) Y-(Biceps muscle) contracts/shortens
(c) Z (Triceps muscle) relaxes.
(d) P
(e) A reflex is an involuntary or automatic, action that your body does in response to something - without you even having to think about it.

6. 1 – (e), 2 – (c), 3 – (d), 4 – (a), 5 – (b)

7. (a) True (b) False (c) False
(d) False (e) True (f) False
(g) False (h) True (i) False
(j) False

8.

(a)	Antimalarial	(b)	Azadirachtin
(c)	*Coptis japonica*	(d)	Capsaicin
(e)	*Papaver* spp.	(f)	Cardiac tonic
(g)	*Dioscorea deltoidea*	(h)	Scopolamine
(i)	*Cinchona officinalis*	(j)	*Lithospermum erythrorhizon*
(k)	Taxol	(l)	Vincristine

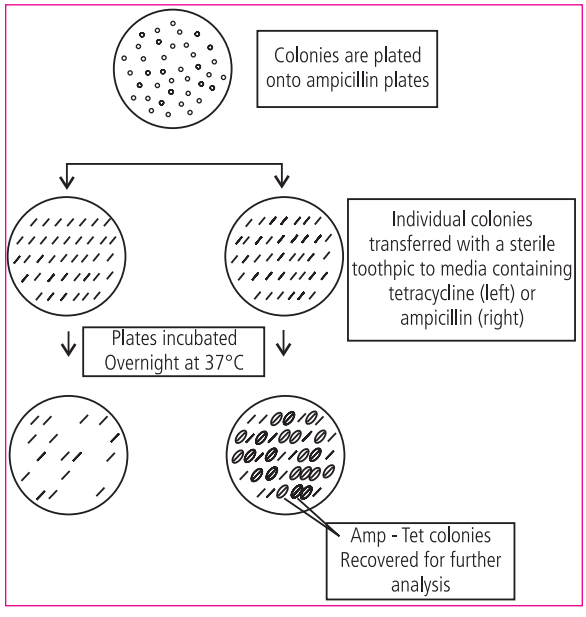
9. (a) pBR322 is an example of an artificial plasmid cloning vector. The name pBR denotes the following: p signifies plasmid, B is from Boliver, and R is from Rodriguez, the two initials of the scientist who developed pBR322.

(b) Insertional inactivation – Subcloning a DNA fragment into an active gene (usually a marker gene whose function can be easily detected) will disrupt the function of that gene. This can be detected by looking for colonies that no longer display that phenotype

(c) Bacillus amylolique faciens Bam H1 5′ GGA TCC3′
3′ CCt AGG 5′

(d) Rop codes for the proteins involved in the replication of the plasmid.

(e)



10. 1. weed of laboratory.
2. Guniea pig of plant kingdom
3. aflatoxin.
4. *A. fumigatus*
5. *A. niger*

11. (a) – 10 (b) – 3 (c) – 17 (d) – 7 and 14 (e) – 9

12. All statements are true.

13. (a) *Arabidopsis thaliana*, polyhydroxybutyrate, or (PHB)
(b) Anand Mohan Chakrabarty, *Pseudomonas putida*
(c) X-CAM, Y-OCT
(d) Atomita 2
(e) *Chrysanthemum*

14. (I) – (a), (II) – (b), (III) – (c), (IV) – (d), (V) – (e)

15. (a) Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles.
(b) Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased. One of the major causes of this is cigarette smoking.
(c) Occupational Respiratory Disorders: In certain industries, especially those involving grinding or stone-breaking, so much dust is produced that the defense mechanism of the body cannot fully cope with the situation. Long exposure can give rise to inflammation leading to fibrosis (proliferation of fibrous tissues) and thus causing serious lung damage.
(d) Haldane effect-Binding of oxygen with haemoglobin tends to displace carbon dioxide from the blood.
(e) Bohr effect-Shifting of the oxygen Haemoglobin dissociation curve to right by increasing carbon dioxide partial pressure is known as Bohr Effect.

16. 1. X-a, Y-b, Z-c 2. X-d, Y-e, Z-e
3. X-f, Y-g, Z-h 4. X-i, Y-i, Z-j
5. X-k, Y-k, Z-l

17. 1 – (a, b, g); 2 – (d, e); 3 – (j); 4 – (f); 5 – (c,h,i)

18. (a) A-Lenticel, B-Cross section of shaft of cilia/flagella
(b) X-Complementary cells, nature-Parenchymatous
Y-Dyanin-nature-motor protein
(c) 24-23 X 9 + 13 X 2 =231-240
(d) Phellogen
(e) Hydathodes

19. (a) – Vascular bundles in rings in monocot stem
(b) – Presence of cortex, endodermis, pericycle and pith,
(c) – Scattered vascular bundles in dicot stem
(d) – Vascular bundles in cortex/cortical bundles.
(e) – Intraxylary (internal) phloem or inner-side of cambium

20. (A) (a) Oxygen evolves when water is split in the oxygen-evolving-complex of photosystem II in the lumen of the thylakoid membrane
(b) If both are in the sealed jar the C_4 will be efficient at low concentrations of CO_2, while the C_3 plant will "photorespire itself to death". The CO_2 from the C_3 plant will be fixed by the C_4 plant. At low temperatures, in the unsealed jar the two plants will survive, but the C_3 plant is more efficient at low temperatures due to the decrease of dissolved O_2, and higher energy cost of C_4 photosynthesis.
(c) The rate of carbon fixation is not limited by the amount of rubisco in leaves. In fact most leaves have an excess of rubisco
(B) anomocytic, anisocytic ■■

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Having experience of 11 years, he started teaching for medical entrance at the age of 17 years in 1997, that time he was himself a PMT aspirant. After cracking PMT he opted for teaching as a profession and now it has become a passion for him. He has worked with different institute of indore and kota in the span of 11 years as a faculty member of biology. Presently he is working with Rankers point as a HOD of Botany. His expert guidance has helped his student in securing TOP Ranks in different medical entrance.

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