ULTIMATE KCET

CRASH COURSE 2026

Biology (Zoology) | Lecture - 01

Animal Kingdom Structural Organization In Animals (Frog)
Biomolecules

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Recap *of previous lecture*

1. Biotechnology: Principles and Processes - Synopsis
2. Biotechnology and its Applications - Synopsis
3. Most Important MCQs

Topics *to be covered*

1. Animal Kingdom — 1 Q
2. Structural Organisation in Animals - Frog — 1 Q
3. Biomolecules — 1 Q

4. Most Important MCQs

Kingdom

Levels of Organization

Symmetry

Body cavity or Coelom

Phylum

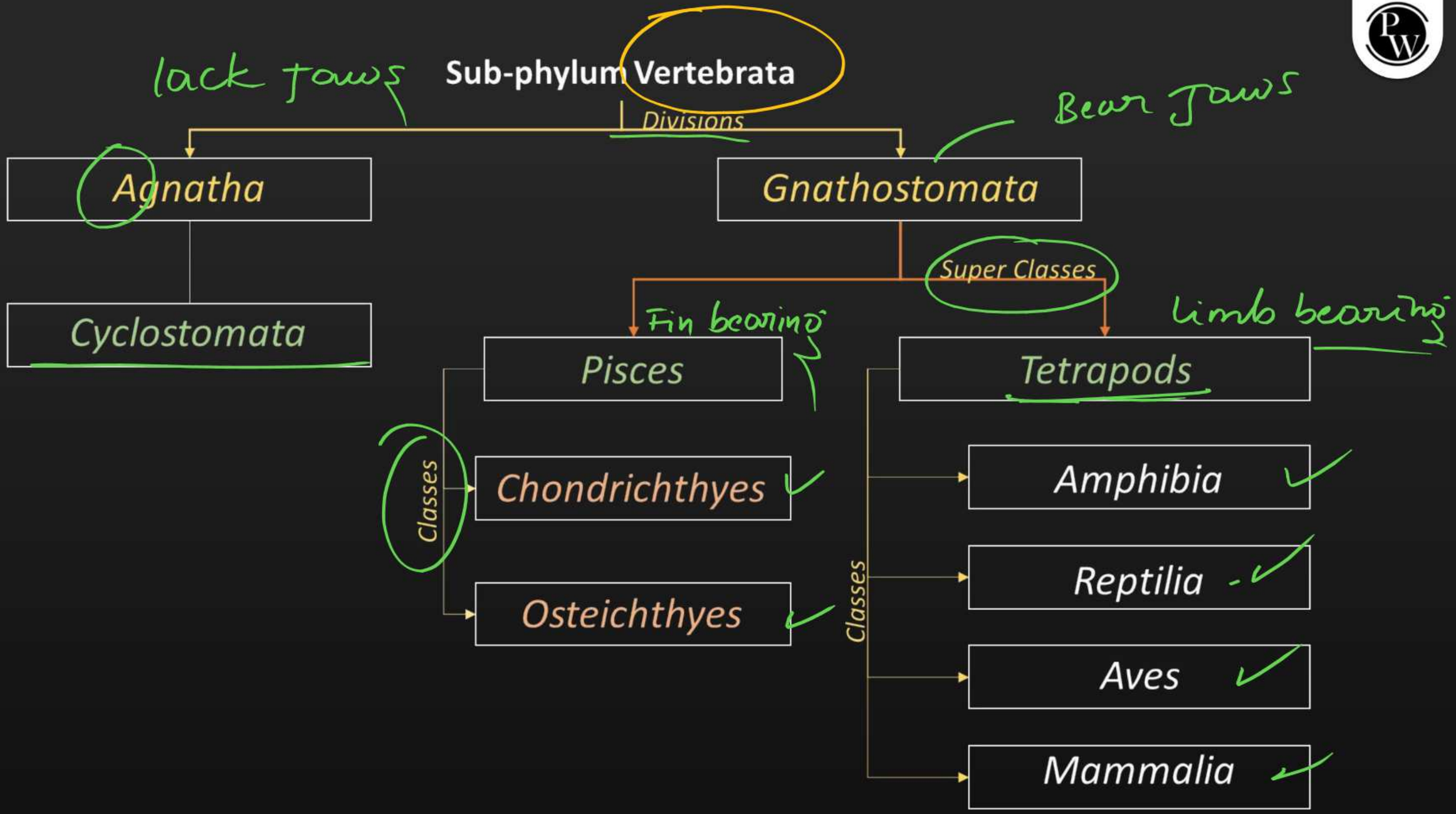
Animalia (Multicellular)

- Cellular Level
  - Poriferà
- Tissue / Organ / Organ System
  - Radial (at any plane)
    - Coelenterata → Cnidaria
    - Ctenophora
  - Bilateral
    - Acoelomate
      - Platyhelminthes
    - Pseudocoelomate (cavity is not lined by mesoderm)
      - Aschelminthes
    - Coelomate
      - Annelida
      - Arthropoda
      - Mollusca
      - Echinodermata
      - Hemichordata
      - Chordata

Chordata

Tail

- **Urochordata**
  - Notochord is present only in larval tail
  - Doliolum, Salpa, Ascidia
- **Cephalochordata**
  - Notochord present from head to tail
  - persist throughout the life.
- **Vertebrata**


lack jaws
Sub-phylum Vertebrata
Divisions
Bear Jaws
Agnatha
Gnathostomata
Cyclostomata
Super Classes
Fin bearing
limb bearing
Pisces
Tetrapods
Classes
Chondrichthyes
Osteichthyes
Classes
Amphibia
Reptilia
Aves
Mammalia

Definitions

Terminologies	Definitions
Bilateral Symmetry	The body can be divided into identical left and right halves in only one plane.
Diploblastic animals	Animals in which the cells are arranged in two embryonic layers, an external ectoderm and an internal endoderm.
Mesoglea	An undifferentiated layer, present in between the ectoderm and the endoderm.
Pseudocoelom	The body cavity is not lined by mesoderm, instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm.
Metamerism	The linear series of body segments.
Hermaphrodites	Organism having both male and female sex organs.

Definitions

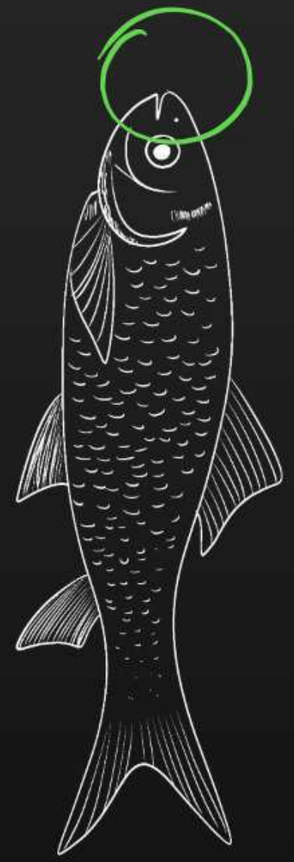
Terminologies	Definitions
Metagenesis	An alternation of two life forms in an organism.
Bioluminescence	The property of a living organism to emit light. – ctenophora
Poikilothermous	Organisms that vary their internal body temperature within a wide range of temperatures.
Homoiothermous	Organisms that maintain a constant internal body temperature.
Buoyancy	The tendency of an animal to float in a water.

cold blooded

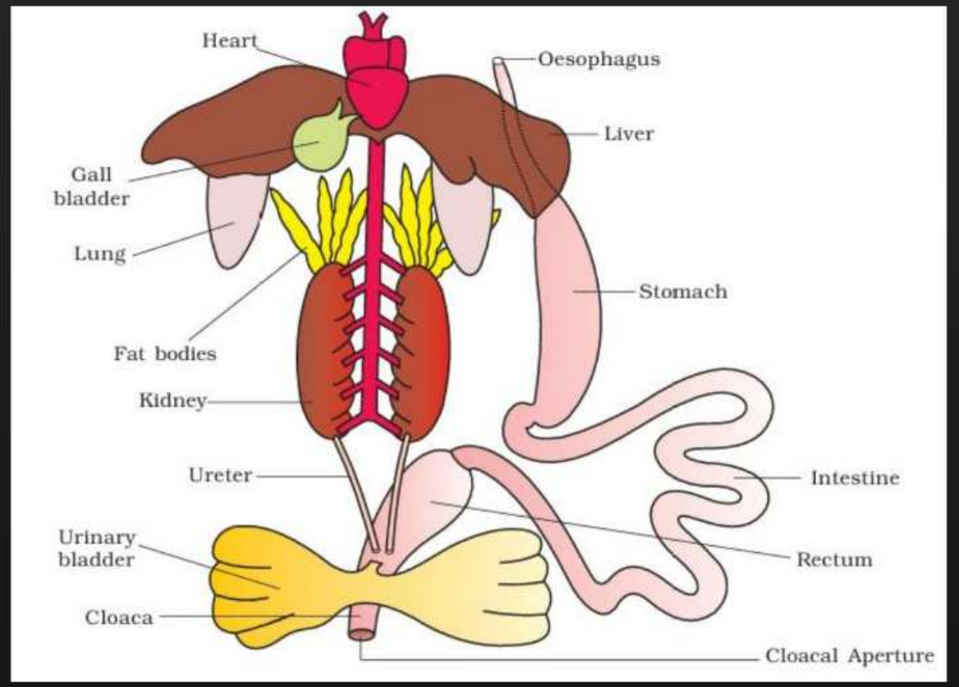
warm

Differentiate between Chondrichthyes and Osteichthyes, with suitable example.

Chondrichthyes	Osteichthyes
There are marine animals	Both marine and fresh water in habitat
Have cartilaginous endoskeleton	have bony endoskeleton
Mouth is located ventrally	Mouth is mostly terminal
Operculum or gill cover is absent	Operculum or gill cover is present
Air bladder is absent	Air bladder is present
Fertilization is internal	Fertilization is usually external
They are viviparous	These are oviparous

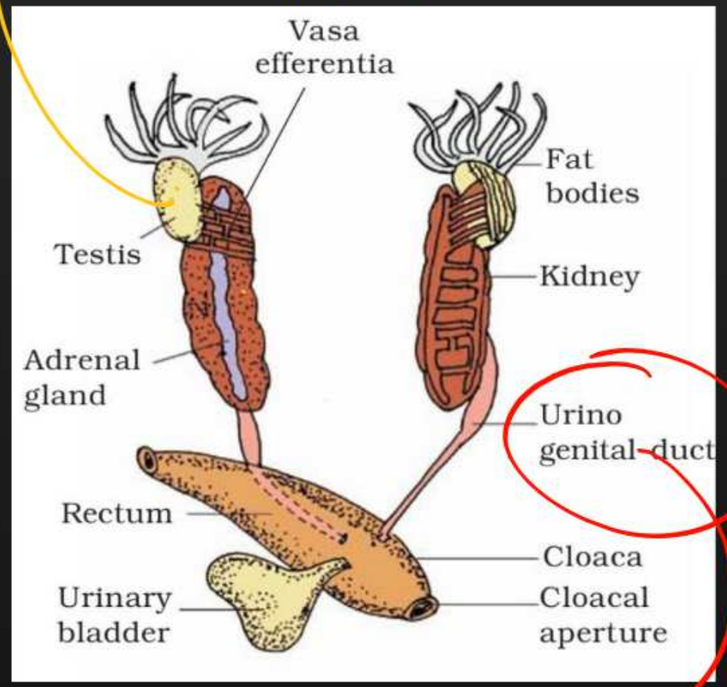


Frog - Anatomy



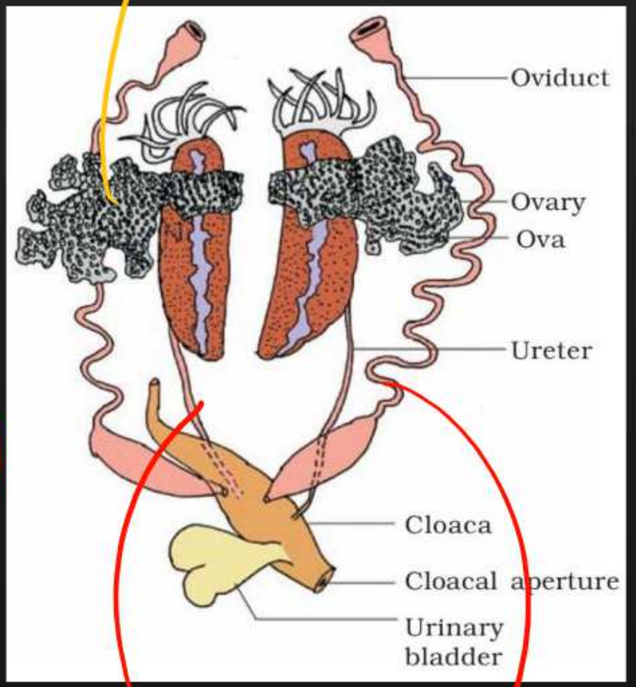
Functional connection blw testes & kidney

Male



Ovaries

Female



Semen + Urine

Ureter

Oviduct

Frog → Head & trunk.

Camouflage, mimicry, Aestivation, Hibernation

Aestivation - Summer sleep

Hibernation - winter sleep

poikilothermous - cold blooded.

Sexual dimorphism - Male - vocal sac

Fore limbs - 4 digits
Hind limbs - 5 digits
} webbed.

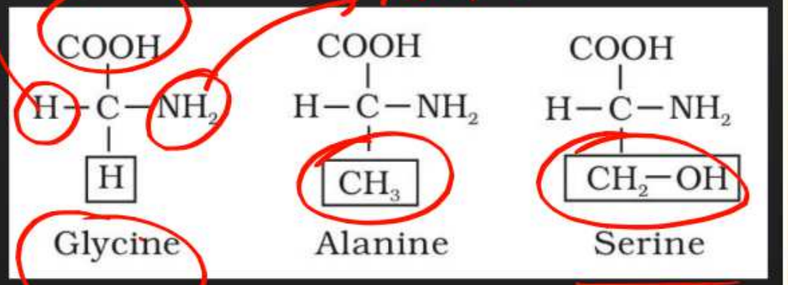
copulatory pad
1st digit of the fore limbs

Biomolecules

Macromolecules → polymers

Sec. metabolites

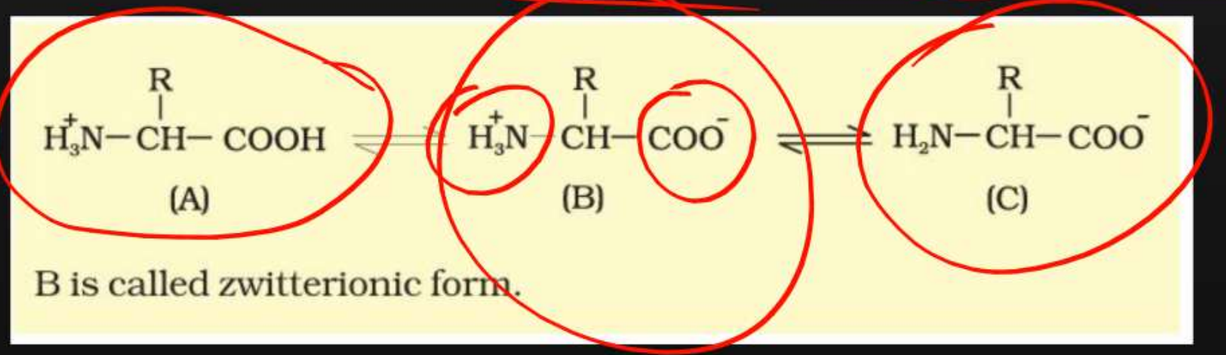
Hydrox → Carboxyl / Amine



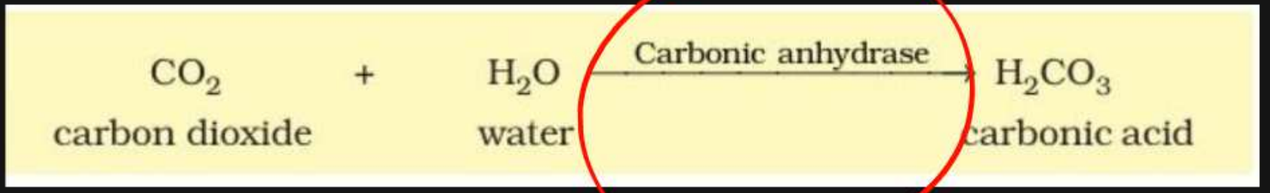
Aminoacids substituted methane

Protein	Functions
Collagen	Intercellular ground substance
Trypsin	Enzyme
Insulin	Hormone
Antibody	Fights infectious agents
Receptor	Sensory reception (smell, taste, hormone, etc.)
GLUT-4	Enables glucose transport into cells

Pigments	Carotenoids, Anthocyanins, etc.
Alkaloids	Morphine, Codeine, etc.
Terpenoides	Monoterpenes, Diterpenes etc.
Essential oils	Lemon grass oil, etc.
Toxins	Abrin, Ricin
Lectins	Concanavalin A
Drugs	Vinblastin, curcumin, etc.
Polymeric substances	Rubber, gums, cellulose



B is called zwitterionic form.



Question (KCET - 2018)

Match the animals of Column I with their respective classes in Column II and choose the correct answer.

Column - I		Column - II	
a	Aptenodytes → penguin	p	Aves
b	Hemidactylus	q	Chondrichthyes
c	Carcharodon	r	Mammalia
d	Pteropus → Flying fox	s	Reptilia
		t	Osteichthyes

A) a-t, b-q, c-s, d-p

B) a-t, b-p, c-q, d-r

C) a-p, b-s, c-r, d-q

D) a-p, b-s, c-q, d-r

Question (KCET - 2021)

Identify the correct statement/s regarding class aves.

1. Forelimbs are modified into wings and hindlimbs are modified for walking and swimming.
2. Heart is completely four-chambered.
3. They are homeotherms.
4. They are oviparous and development is direct.

(A) Both (a) & (c)

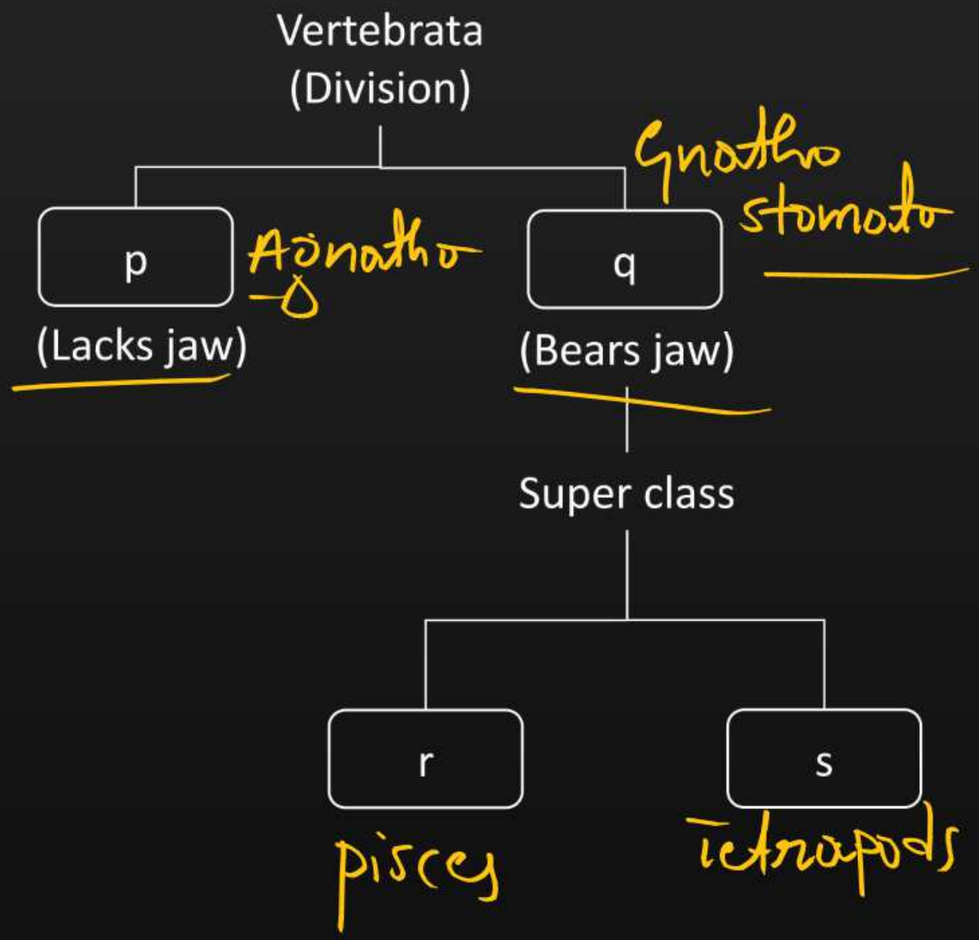
(B) (a), (b) and (c)

(C) Both (a) & (d)

(D) All are correct

Question

Observe the following simplified scheme and choose the correct option that matches with the letters given in the boxes.



A. p-Agnatha, q-Gnathostomata, r-Tetrapoda s- Pisces

B. p-Agnatha, q-Gnathostomata, r-Pisces, s-Tetrapoda

C. p-Gnathostomata, q-Agnatha, r-Tetrapoda, s-Pisces

D. p-Tetrapoda, q-Pisces, r-Gnathostomata, s-Agnatha

Question

Which one is not correctly matched?

A. Mollusca - Pseudocoel

B. Cnidaria - Nematocyst

C. Annelida - Chloragogen cells

D. Echinodermata - Water vascular system

Question

Which of the following statements are true/false?

I. Choanocytes are used for anchorage, defence and for the capture of prey.

II. Radial symmetry is the most common symmetry found in higher animals.

III. Hirudinaria is a blood-sucking leech.

IV. All triploblastic animals have a true coelom.

V. Locusta acts as a vector.

(A) I and V are true and II, III and IV are false.

(B) II, III and V are true and I and IV are false.

(C) I, II and III are true and IV and V are false.

(D) I, II, IV and V are false, only III is true.

Question

Common characteristics found between Aves and mammals are:

A. Respiration is by the lungs.

B. Heart is four-chambered.

C. Homoiothermous animals. (warm blooded)

D. Larva is not found.

E. Dioecious and internal fertilisation.

(Dioecious → unisexual / sexes are separate)

(A) Three

(B) Four

(C) Five

(D) Two

Question

Select the incorrect match with respect to group of animals and their taxon.

A. *Ichthyophis, Bufo, Hyla* - Amphibia

B. *Hippocampus, Exocoetus, Pterophyllum* - Osteichthyes

C. *Corvus, Chelone, Calotes* - Reptilia

D. *Pteropus, Equus, Delphinus* - Mammals

Question

Read the given characters.

I. Extracellular and intracellular digestion

II. Exclusively marine, radially symmetrical, diploblastic, tissue level of organisation

III. Bisexual, fertilisation external and indirect development

IV. No asexual reproduction

V. Presence of comb plates

comb jellies.

The characters given above are shown by which phyla?

A. Cnidaria

B. Porifera

C. Ctenophora

D. Platyhelminthes

Question

Which of the following statements are correct?

A. In earthworm, the body shows metameric segmentation.

B. Aschelminthes are pseudocoelomates.

C. Sponges are mostly asymmetrical.

D. Mesoglea is an undifferentiated layer present in between the ectoderm and the endoderm.

A. A and B only

B. B and C only

C. B, C and D only

D. A, B, C and D

Question

Read the following statements (A-D) w.r.t amphibians.

A. The body is divisible into the head and trunk.

B. A tympanum represents the ear.

C. The heart is four chambered.

D. Respiration is only by gills and lungs.

Which of the following statements are correct?

(A) B and C only

(B) C and D only

(C) A and D only

(D) A and B only

Question

Consider the following statements.

(A) Protochordates are exclusively marine

(B) In cephalochordates, notochord extends from head to tail region.

(C) In urochordates, notochord is present only in larval tail.

(D) Cranium and vertebral column are bony in cyclostomes..

Which of the above statement(s) is/are correct?

A. A only

B. B, C and D only

C. A, B and C only

D. A,B,C and D only

Question

Which one of the following statements is false?

Soft-bodied organism

Feather-like

A. In Molluscs, gills have respiratory and excretory functions.

B. In Molluscs, the head has sensory tentacles.

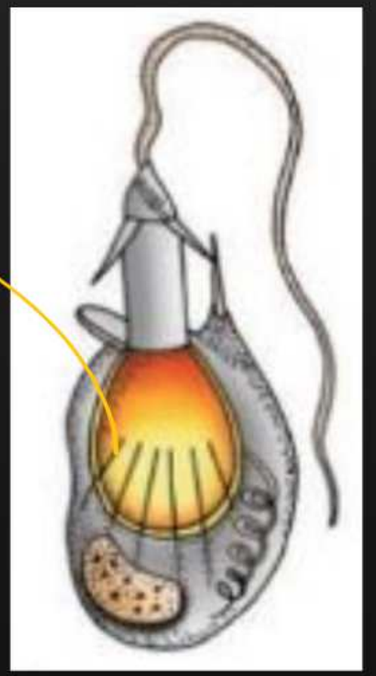
C. Molluscs are dioecious, oviparous with indirect development

D. None of these.

Question

Refer to the structure given below:

Which of the following is the correct phylum and function of the structure shown above?



Cnedoblast

A. Ctenophora; Emission of light.

B. Porifera; Feeding, respiration and excretion.

C. Cnidarian; Anchorage, Defense and food capturing

D. Mollusca; Locomotion, transport of food and respiration.

Question

Which of the following is correctly matched?

A. Radial symmetry - Coelenterates ✓

B. Coelomates - Aschelminthes → pseudo coelom

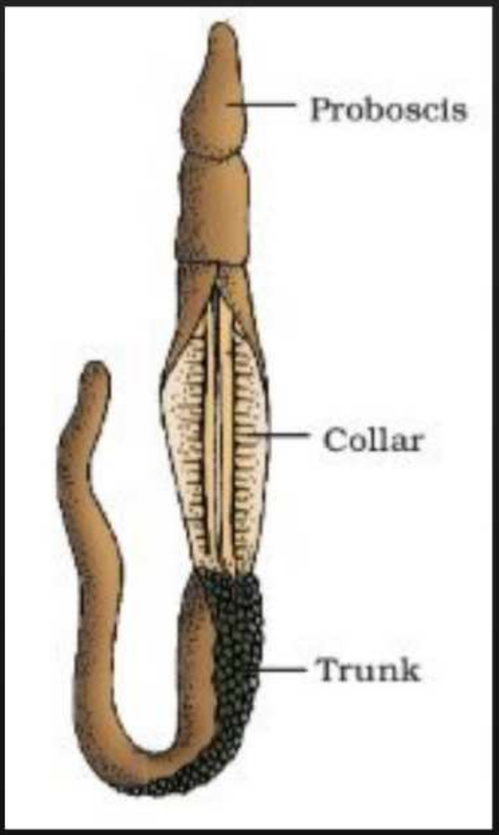
C. Metamerism - Molluscs ✗ (Annelida)

D. Triploblastic - Sponges ✗

Question

Consider the organism given below.

Which of the following statements is incorrect w.r.t. the organism?



A. It is a non- chordate.

B. It is bilaterally symmetrical, triploblastic and coelomate.

C. Respiration takes place through the lungs.

D. Excretory organ is proboscis gland.

Question (KCET - 2022)

The phylum Arthropoda is characterised by:

A. Chitinous exoskeleton, external segmentation and jointed appendages.

B. Chitinous endoskeleton, external segmentation and antennae.

C. Chitinous exoskeleton, internal segmentation and compound eye.

D. Chitinous endoskeleton, internal segmentation and paired appendages.

Question

In contrast to Annelids, the Platyhelminthes show-

A. Absence of body cavity

B. Presence of pseudocoel

C. Radial symmetry

D. Bilateral symmetry

Question

In most simple type of canal system of Porifera, which of the following ways exhibit water flow?

A. Ostia → Spongocoel → Osculum → Exterior

B. Spongocoel → Ostia → Osculum → Exterior

C. Osculum → Spongocoel → Ostia → Exterior

D. Osculum → Ostia → Spongocoel → Exterior

Question

In platyhelminthes:

A. The embryonic layers ectoderm and endoderm, are separated by mesoglea.

B. They are asymmetrical.

C. They exhibit tissue level of organisation.

D. The body cavity is absent.

Question

Which of the following is not a characteristic feature of sponges?

A. Cellular level of organization.

B. Presence of a water transport system with ostia, spongocoel, and osculum.

C. Direct development without any larval stage.

D. Digestion is intracellular.

Question

The unique mammalian characteristics are;

A. Pinna, monocondylic skull and mammary glands

B. Hairs, tympanic membrane and mammary glands

C. Hairs, pinna and mammary glands

D. Hairs, pinna and indirect development

Question

Which of the following statements are true for the phylum-Chordata?

A. In Urochordata notochord extends from neck to tail and it is present throughout their life.

B. In Vertebrata, the notochord is present during the embryonic period only.

C. Central nervous system is ventral and hollow in chordates.

D. Chordata is divided into 3 subphyla: Hemichordata, Tunicata and Cephalochordata.

Question

Respiration occurs through moist skin is called;

A. Pulmonary respiration – lungs

B. Branchial respiration – gills

C. Cutaneous respiration – moist skin ✓

D. None of the above ✗

Question

Male frogs can be distinguished by the presence of

Sound producing

A. Vocal sacs and Copulatory pad → 1st digit of forelimb.

B. Tympanum and Vocal sacs

C. Tail and Vocal Sac

D. Copulatory organ and Exoskeleton

Question

During winter season, frog undergo;

A. Aestivation - Summer

B. Hibernation

C. Diapause

D. Moulting

Question

Assertion (A): The digits for forelimbs of a frog possess a web.

Reason (R): The webs found in the digits of forelimbs help in swimming

A. Both (A) and (R) are true and (R) is the correct explanation of (A).

B. Both (A) and (R) are true but (R) is not the correct explanation of (A).

C. (A) is true but (R) is false.

D. Both (A) and (R) are false.

Question

Assertion (A): Frogs have a short alimentary canal.

Reason (R): They are carnivores.

Insectivores

Herbivores → longer alimentary canal.

A. Both (A) and (R) are true and (R) is the correct explanation of (A).

B. Both (A) and (R) are true, but (R) is not the correct explanation of (A).

C. (A) is true, but (R) is false.

D. (A) is false, but (R) is true.

Question

Regarding frogs:

Statement I: They have the ability to change the colour to hide them from their enemies (camouflage).

Statement II: They undergo summer sleep called as hibernation as well as winter sleep called as aestivation.

→ Aestivation → Winter sleep

A. Only Statement II is correct

B. Only Statement I is correct

C. Both Statement I and Statement II are incorrect.

D. Both Statement I and Statement II are correct

Question

Frog's heart when taken out of the body continues to beat for some time.

Select the best option from the following statements.

(A) Frog is a poikilotherm.

(B) Frog does not have any coronary circulation.

(C) Heart is "myogenic" in nature.

(D) Heart is autoexcitable → Muscle of muscle

A. Only (D)

B. (A) and (B)

C. (C) and (D)

D. Only (C)

Question

Compared to those of humans, the erythrocytes in frog are

RBCs – Enucleated (No nucleus) + Haemoglobin.

A. Without nucleus but with haemoglobin

B. Nucleated and with haemoglobin ✓

C. Very much smaller and fewer ✗

D. Nucleated and without haemoglobin ✗

Question

Ureters act as urinogenital ducts in

→ carries both semen + Urine

A. Human males ✗

B. Human females ✗

C. Both male and female frogs ✗

D. Male frogs ✓

Question

Identify the incorrect statement amongst the following

A. There is no functional connection of ovaries with kidneys in female frog

B. In male frog, the ureter arises as urogenital duct and opens into the cloaca

C. The fertilization in frog is external

D. Development in frogs is direct

Larval

Indirect

Question

A mesenteric peritoneal fold that attaches the testes of frog to its kidney is;

→ Thin, membranous layer

(A) Mesorchium ✓

(B) Mesocolon ✗

(C) Cauda epididymis ✗

(D) Omentum ✗

Question

98% of living organism is formed of six elements - carbon, hydrogen, oxygen, nitrogen and...

A. S and Mg

B. Mg and Ba

C. Ca and P

D. P and S

Question

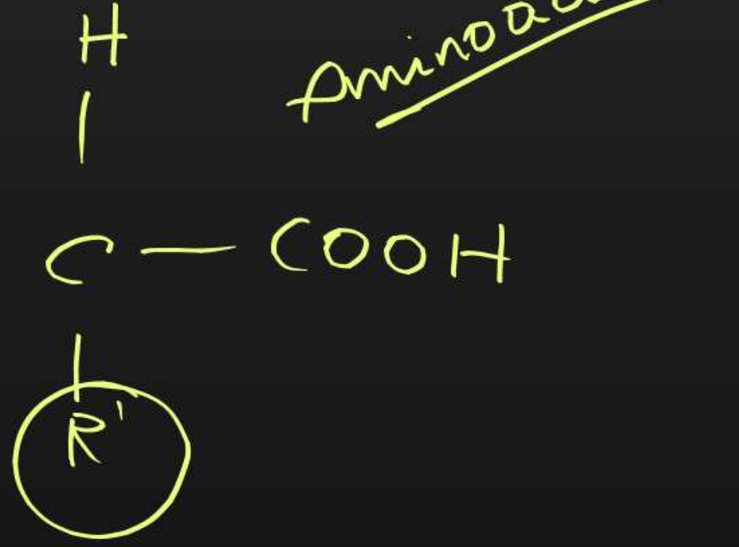
Which of the following bond is formed as a result of reaction of carboxyl group of one amino acid with amino group of other amino acids with elimination of water?

A. Phosphodiester Bond — b/w nucleotides.

B. Hydrogen Bond — no water elimination

C. Glycosidic Bond → b/w sugars

D. Peptide Bond ✓ — proteins



Question

Identify the basic amino acid from the following.

A. Glutamic Acid (Acidic)

B. Lysine (Basic)

C. Valine (nutral)

D. Tyrosine (Aromatic)

Question

Which of the following organic compounds is the main constituent of Lecithin?

plasma membrane

A. Arachidonic acid ✗

B. Phospholipid ✓

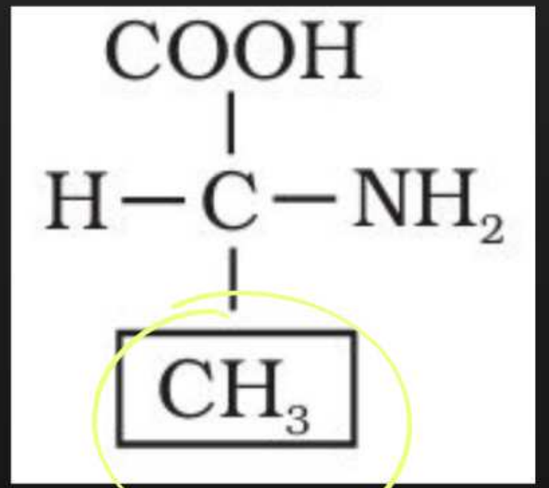
C. Cholesterol ✗

D. Phosphoprotein ✗

Lipid bilayer

Question

Identify the following structure;



A. Glycine

B. Alanine

C. Serine

D. Valine

Question

Choose the incorrect statement:

Micromolecules

A. All compounds found in the acid-soluble pool have their, molecular weight ranging from 18 to 800 Da.

B. Polysaccharides, nucleic acids, Proteins comprise the macromolecular fraction of any living tissue.

C. When we grind tissue we do not disturb the cell structure.

D. Percentage of protein is about 10-15 in cellular mass

Question

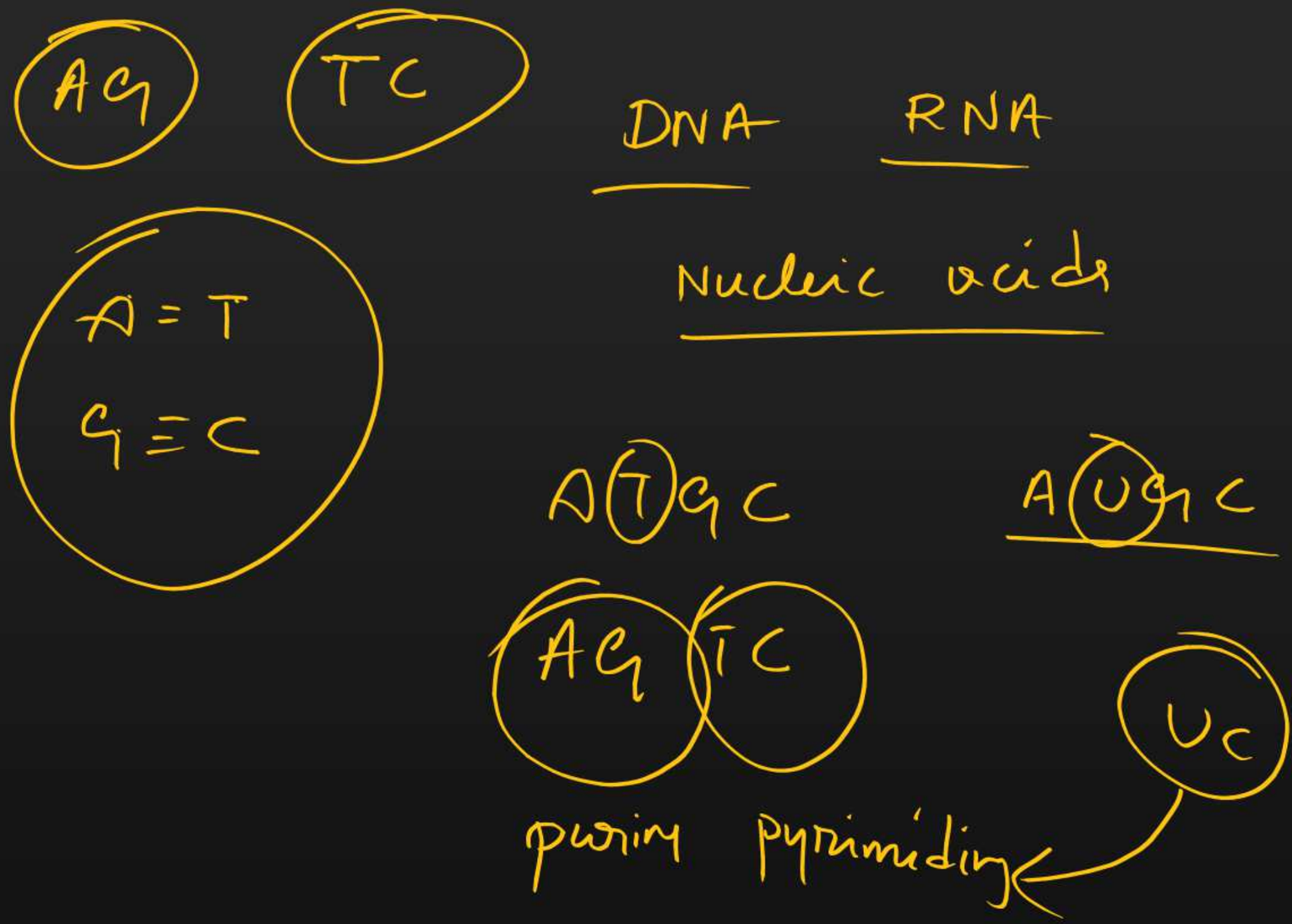
Uracil, present only in RNA is:

A Nucleoside

B Nucleotide

C Purine

D Pyrimidine



Question (KCET - 2021)

Which one of the following pairs on nitrogenous bases of nucleic acids., is wrongly matched with the category mentioned against it?

A. Thymine, Uracil - Pyrimidines

B. Uracil, Cytosine - Pyrimidines

C. Guanine Adenine - Purines

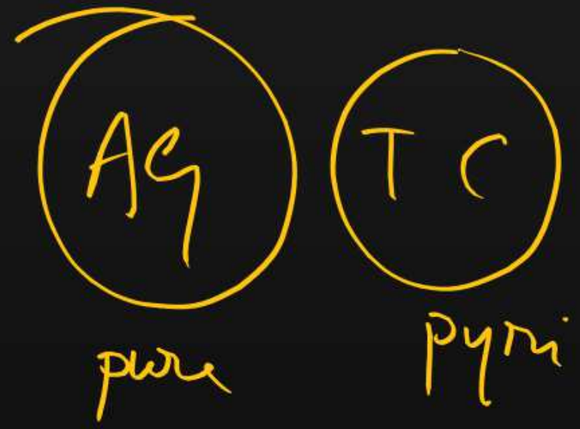
D. Adenine, thymine - Purines

Sugar + Base → Nucleoside

Sugar + Base + phosphate → Nucleotide

Pyrimidine

Guanine



Question (KCET - 2021)

The chitinous exoskeleton of arthropods is formed by the polymerization of

A. D-glucosamine

B. Lipoglycans

C. N – acetyl glucosamine

D. Keratin sulphate and chondroitin sulphate

Question

Match List-I with List-II.

	List - I		List - II
A	Insulin (III)	I	Fights infections agent
B	Antibody (I)	II	Enables glucose transport into cells
C	Receptor (IV)	III	Hormone
D	GLUT-4 (II)	IV	Sensory reception

A. A-iii, B-ii, C-iv. D-i

B. A-iii, B-i, C-iv. D-ii

C. A-i, B-ii, C-iii. D-iv

D. A-ii, B-iii, C-iv. D-i

Question

Which one of the following statements is correct, with reference to enzymes?

A. Apoenzyme = Holoenzyme + Coenzyme

B. Holoenzyme = Apoenzyme + Coenzyme

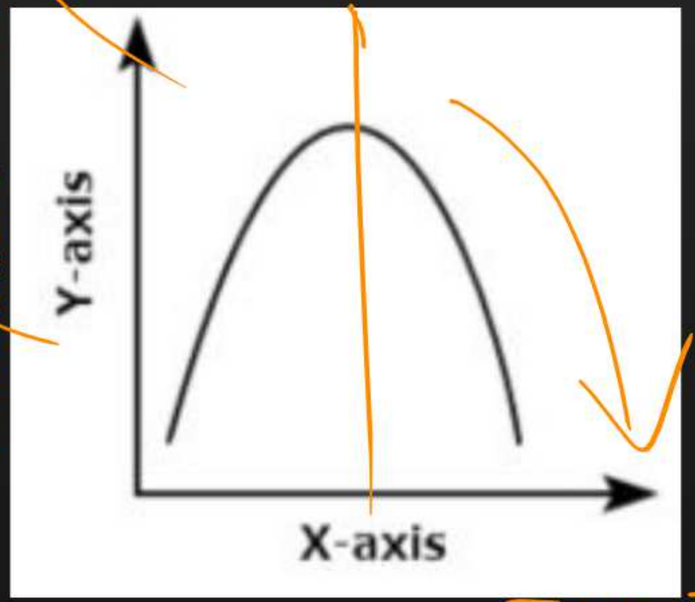
C. Coenzyme Apoenzyme + Holoenzyme

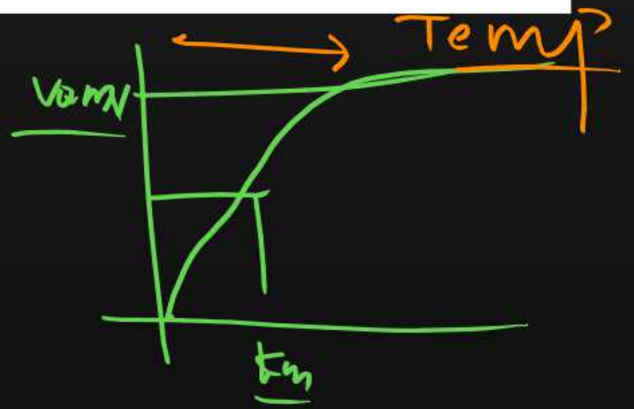
D. Holoenzyme = Coenzyme + Cofactor

Question

The curve given below shows enzymatic activity with relation to three conditions (pH, temperature and substance concentration) what do the two axis (X and Y) represent?

	X - axis	Y- axis
a	Temperature	Enzyme activity
b	Substrate concentration	Enzyme activity
c	Enzyme activity	Temperature
d	Enzyme activity	pH





A a

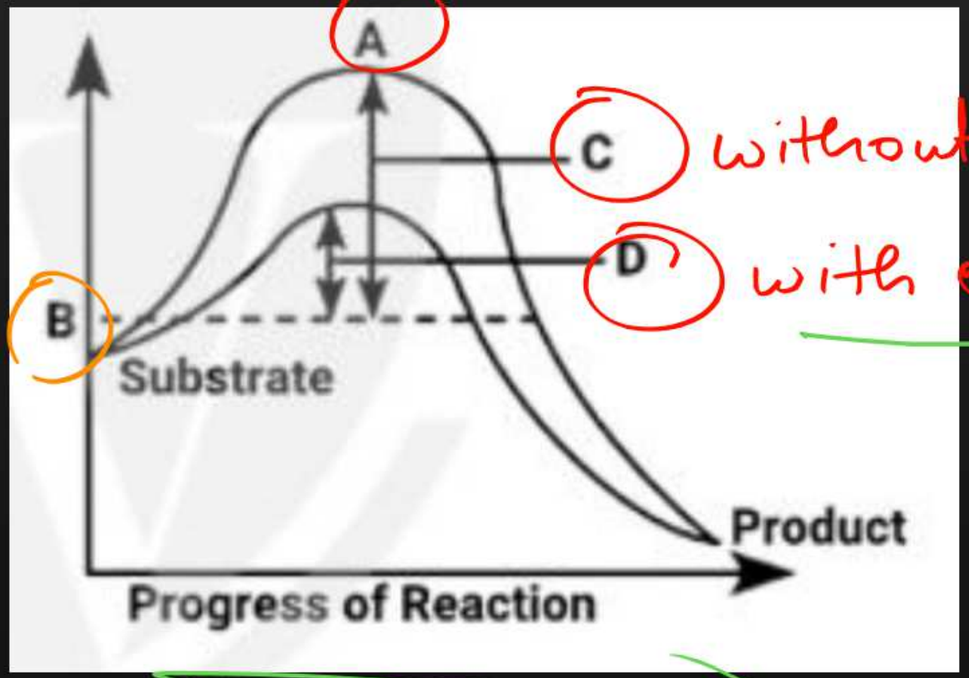
B b

C c

D d

Question

The figure given below shows the conversion of a substrate into product by an enzyme. In which one of the four options (a-d) the components of reaction labelled as A, B, C, and D are identified



Transition

A·E

without enzyme

with enzyme

Graphs

Thank You