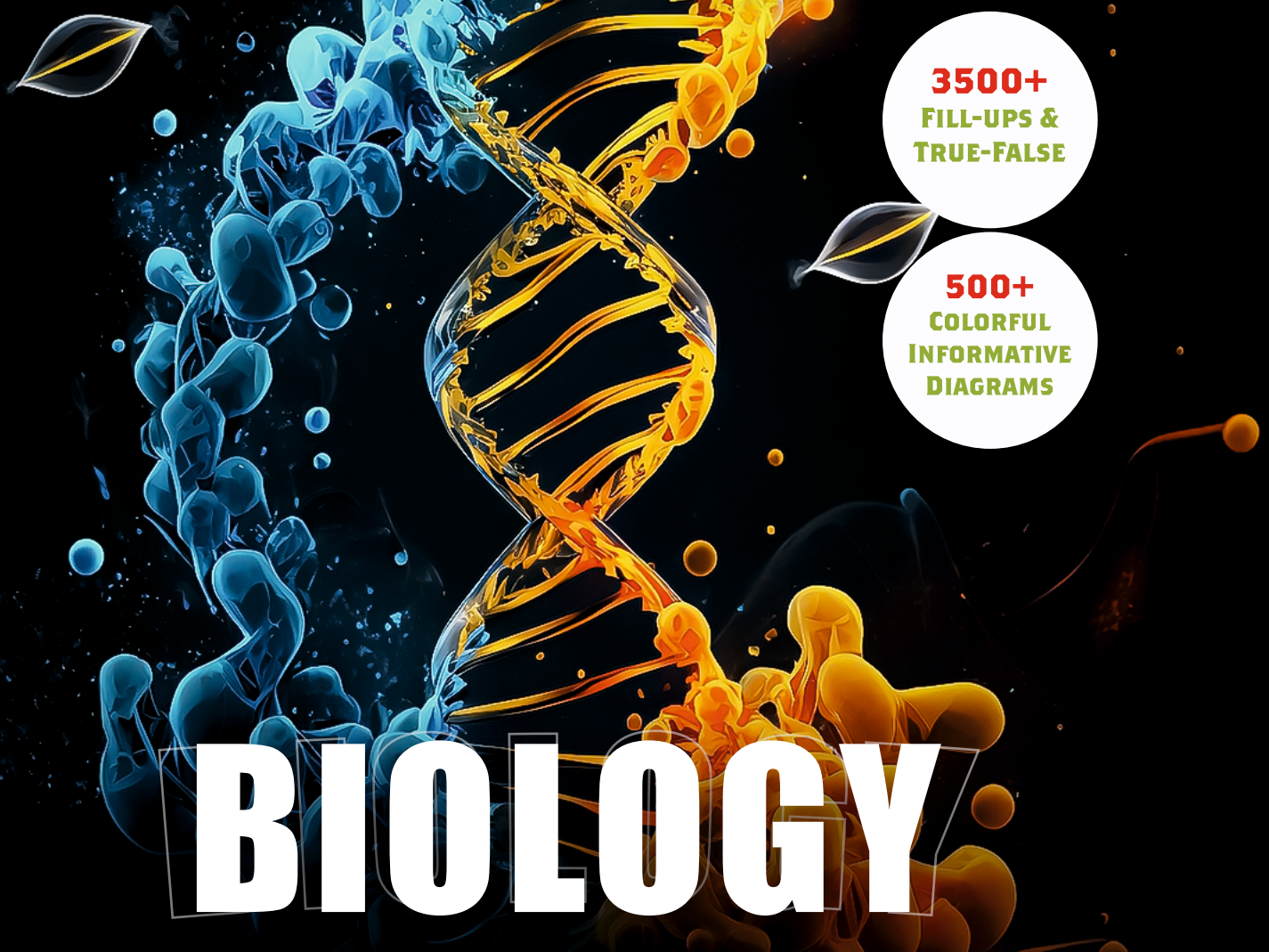
OBJECTIVE NCERT PUNCH

BOOK FOR COMPETITIVE EXAMS (NEET | CUET)

6500+ NTA LIKE MCQs

MCQs Extracted from NCERT Line by Line



3500+ FILL-UPS & TRUE-FALSE

500+ COLORFUL INFORMATIVE DIAGRAMS

BIOLOGY

Highlighted Rationalised Content as per Latest NCERT

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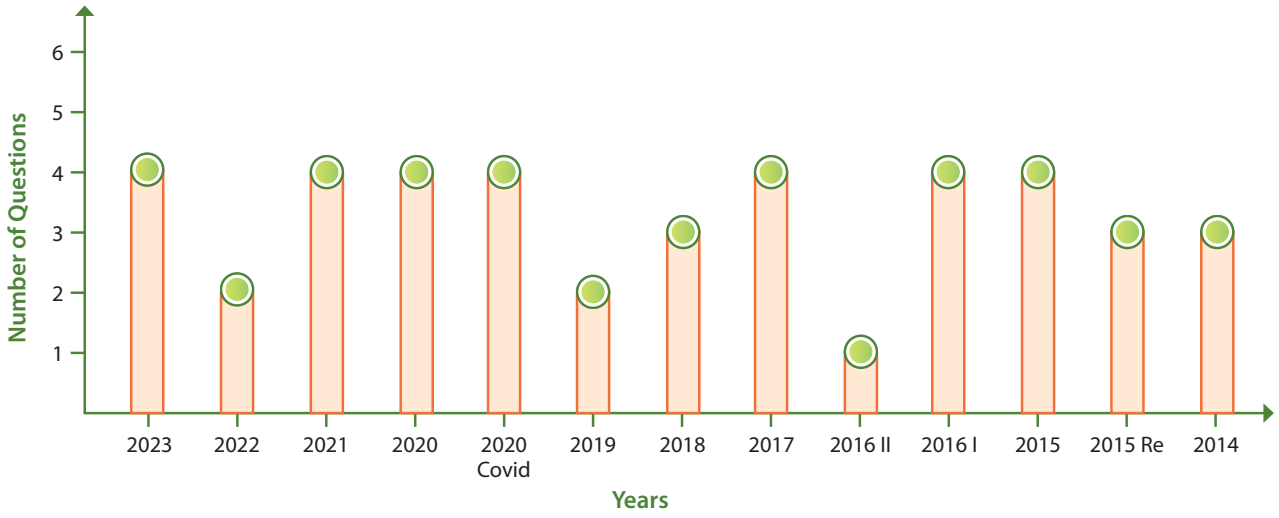
CLASS-XI

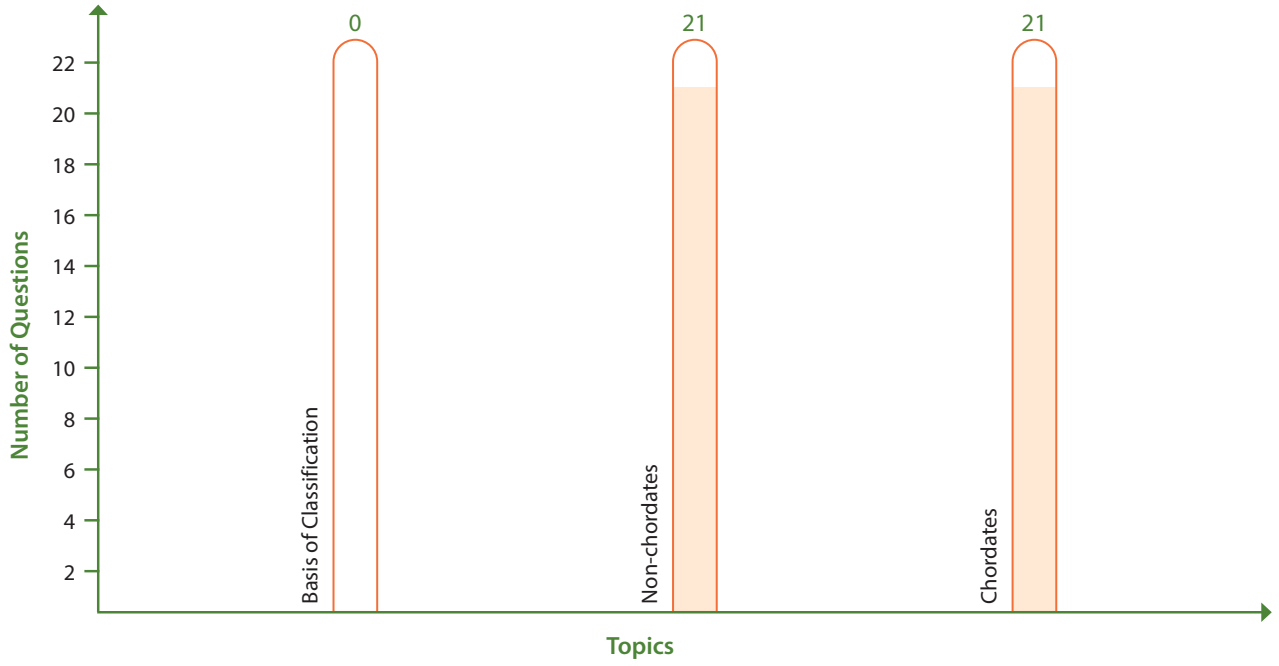
CLASS-XII

4 Animal Kingdom

Year Wise Number of Questions Analysis (2023-2014)



Topicwise Number of Questions Analysis (2023-2014)



NCERT-Picks

Basis of Classification

Animals are classified **on the basis** of arrangement of cells, body symmetry, nature of coelom, patterns of digestive, circulatory and reproductive systems.

Levels of Organisation

Though all members of Animalia are multicellular, all of them do not exhibit the same pattern of organisation of cells.

Levels of Organisation

- **Cellular**
  Cells are arranged as loose cell aggregates, **E.g.**, Sponges.
- **Tissue**
  Cells performing the same function are arranged into tissues, E.g., Coelenterates
- **Organ**
  Here tissues are grouped together to form organs, each specialised for a particular function. **E.g.**, Platyhelminthes and other higher phyla
- **Organ System**
  Organs are associated to form functional systems, each system concerned with a specific physiological function. **E.g.**, Annelids, Arthropods, Molluscs,Echinoderms and Chordates.

Maximise Your Marks

Organ systems in different groups of animals exhibit various patterns of complexities.

Types of Digestive System

Digestive System

Types

- **Incomplete**
  Have only a single opening to the outside of the body that serves as both mouth & anus **E.g.**, Platyhelminthes
- **Complete**
  Have two openings, mouth and anus, **E.g.**, from Aschelminthes to chordates.

Types of Circulatory System

Circulatory System

Types

- **Open Type**
  Here, the blood is pumped out of the heart and the cells and tissues are directly bathed in it.
  E.g., Arthropods and Molluscs
- **Closed Type**
  Here, the blood is circulated through a series of vessels of varying diameters (arteries, veins and capillaries).
  E.g., Annelids and Chordates

Maximise Your Marks

Closed system is considered to be more advantageous as the flow of fluid can be more precisely regulated.

Symmetry in Animals

Symmetry

- **Radial**
  Any plane passing through the central axis of the body divides the organism into two identical halves.
  E.g., Coelenterates, Ctenophores and Echinoderms.

Fig.: Animal with radial symmetry

- **Bilateral**
  The body can be divided into identical left and right halves in only one plane.
  E.g., Annelids, Arthropods,etc.

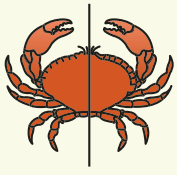


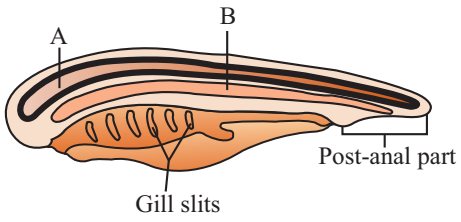
Fig.: Animal with bilateral symmetry

- **Asymmetrical**
  Organisms in which any plane that passes through the centre does not divide them into equal halves.
  E.g., Sponges.

Fig.: Asymmetrical animal

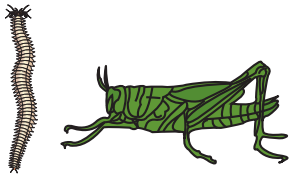
Image Based Questions

1. A and B are respectively represents



1) Nerve cord and notochord
2) Nerve cord and myotomes
3) Notochord and vertebral column
4) Notochord and nerve cord

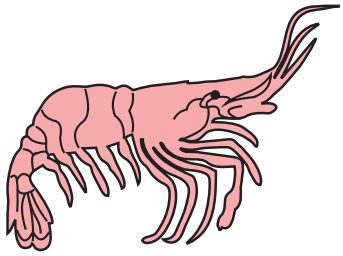
2. Organs for excretion in given organisms A and B respectively are:



A B

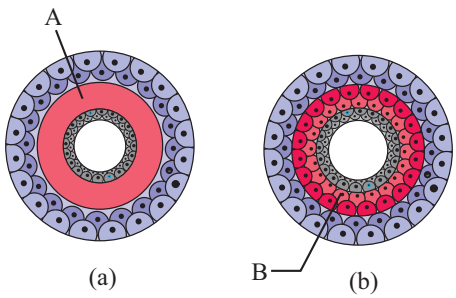
1) Flame cells and nephridia
2) Nephridia and Malpighian tubules
3) Nephridia and Metanephridia
4) Flame cells and Malpighian tubules

3. In the given organism, body is covered by ____ exoskeleton and circulatory system is ____ type.



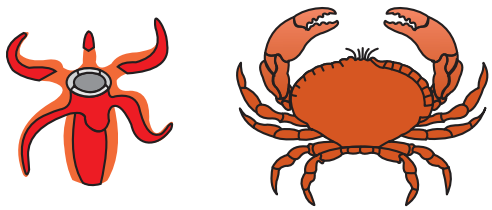
1) Non-chitinous, open
2) Non-chitinous, close
3) Chitinous, open
4) Chitinous, close

4. In the given diagram A and B represents:



1) Mesoglea and mesoderm
2) Parenchyma and mesoglea
3) Mesoglea and endoderm
4) Mesoderm and mesoglea

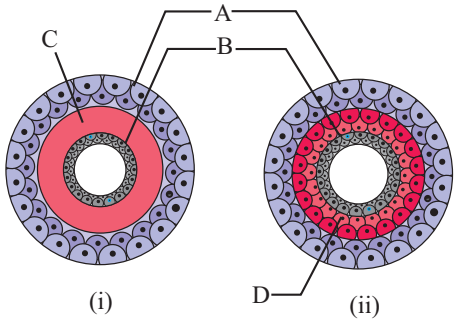
5. The type of symmetry in the given animals is.



A B

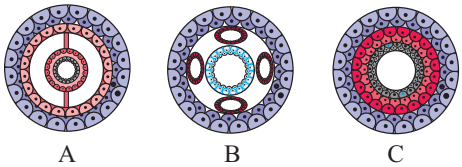
	A	B
1)	Bilateral	Asymmetrical
2)	Bilateral	Bilateral
3)	Radial	Bilateral
4)	Radial	Radial

6. Examine the figures of diploblastic (i) and triploblastic (ii) organization in animals given below and identify the labeled parts A to D.



	A	B	C	D
1)	Mesoglea	Ectoderm	Endoderm	Mesoderm
2)	Endoderm	Mesoderm	Mesoglea	Ectoderm
3)	Mesoderm	Mesoglea	Ectoderm	Endoderm
4)	Ectoderm	Endoderm	Mesoglea	Mesoderm

7. The figures given show the types of coelom. Identify them and select the correct group of organisms which possess them.



A B C

	A	B	C
1)	Annelids	Aschelminthes	Platyhelminthes
2)	Molluscs	Arthropods	Platyhelminthes
3)	Echinoderms	Aschelminthes	Annelids
4)	Echinoderms	Arthropods	Playhelminthes

Statement Based MCQs

Directions: These questions consist of two statements each, printed as Statement-I and Statement-II. While answering these questions, you are required to choose any one of the following four responses.

1) **Both Statement-I and Statement-II are correct.**
2) **Both Statement-I and Statement-II are incorrect.**
3) **Statement-I is correct & Statement-II is incorrect.**
4) **Statement-I is incorrect & Statement-II is correct.**

1. **Statement-I:** Ctenophores are exclusively marine, radially symmetrical, diploblastic organisms.
   Statement-II: Bioluminescence is well marked in ctenophores.
2. **Statement-I:** Sponge has a distinct mouth and digestive cavity.
   Statement-II: Sponges obtain food from mouth.
3. **Statement-I:** Coelenterates does not show alternation of generation.
   Statement-II: In coelenterates, asexual generation is followed by sexual generation.
4. **Statement-I:** The bird can maintain a constant body temperature.
   Statement-II: Birds are cold-blooded animals.
5. **Statement-I:** Osteichthyes have four pairs of gills.
   Statement-II: In osteichthyes, gills are covered by an operculum on each side.
6. **Statement I:** Water current flowing through the canal system is of prime importance for the sponges.
   Statement II: It doesn't helps sponges in nutrition.
7. **Statement I:** Avian bones are pneumatic.
   Statement II: Pneumatic bones makes the body heavier for flight in the air.
8. **Statement I:** Birds and mammals are homeothermic animals.
   Statement II: They are able to maintain a constant body temperature.
9. **Statement I:** Bats and whales are classified as amphibians.
   Statement II: Bats and whales have hairs on their body.
10. **Statement I:** Members of phylum Platyhelminthes are also called flatworms.
    Statement II: It has a dorso-ventrally flattened body.

Assertion & Reason MCQs

Directions: These questions consist of two statements each, printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses.

1) **Both Assertion and Reason are True and the Reason is a correct explanation of the Assertion.**
2) **Both Assertion and Reason are True but Reason is not a correct explanation of the Assertion.**
3) **Assertion is True but the Reason is False.**
4) **Assertion is False but the Reason is True.**

1. **Assertion:** All vertebrates are chordates.
   Reason: In vertebrates, notochord is replaced by a cartilaginous or bony vertebral column.
2. **Assertion:** The body of arthropods is covered by chitinous exoskeleton.
   Reason: Arthropods have jointed appendages.
3. **Assertion:** The members of Aschelminthes are commonly known as flatworms.
   Reason: The body of Aschelminthes is circular in cross-section.
4. **Assertion:** Annelids and chordates have a closed circulatory system.
   Reason: In annelids and chordates, the blood pumped by the heart is always circulated through a closed network of blood vessels.
5. **Assertion:** *Planaria* have great power of regeneration.
   Reason: *Planaria* is also called tapeworm.
6. **Assertion:** Circulatory fluid present in arthropods is called haemolymph.
   Reason: Compound eyes in some arthropods are made of small units called ommatidia.
7. **Assertion:** In cockroach, respiratory gases directly comes in contact with the various organs of the body.
   Reason: Cockroaches do not have respiratory pigment.
8. **Assertion:** *Pristis* belongs to the class osteichthyes.
   Reason: *Pristis* possess minute placoid scales in their skin.
9. **Assertion:** Alimentary canal in Aschelminthes is complete with a well-developed muscular pharynx.
   Reason: An excretory tube removes body wastes from the body cavity through the excretory pore.
10. **Assertion:** *Branchiostoma* and *Balanoglossus* are bilaterally symmetrical and triploblastic animals.
    Reason: They are exclusively marine and posses notochord.

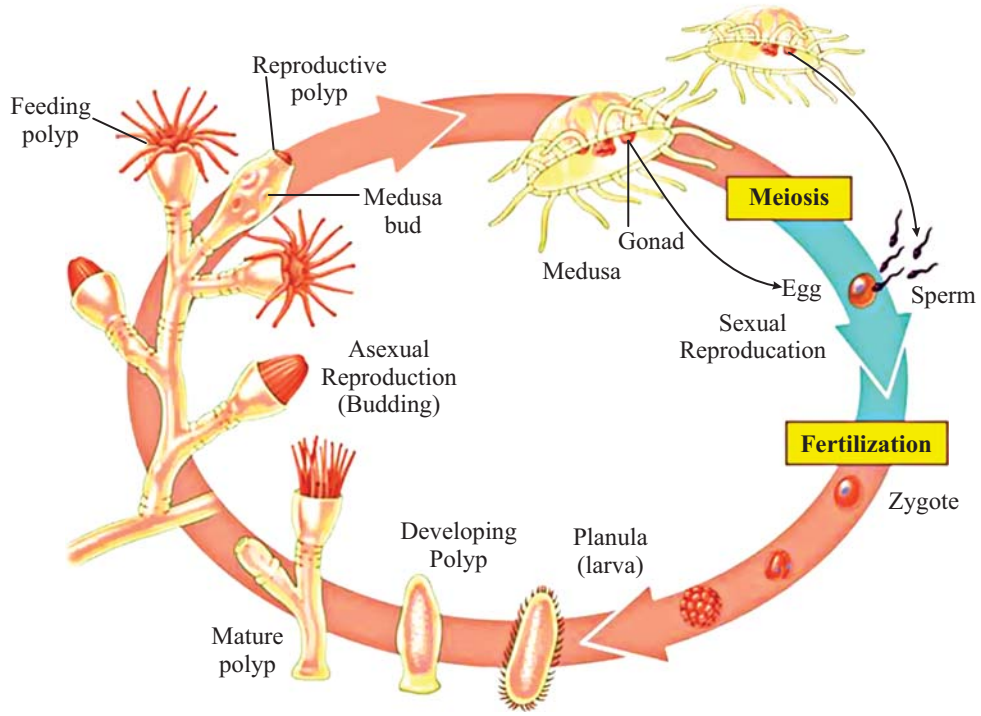
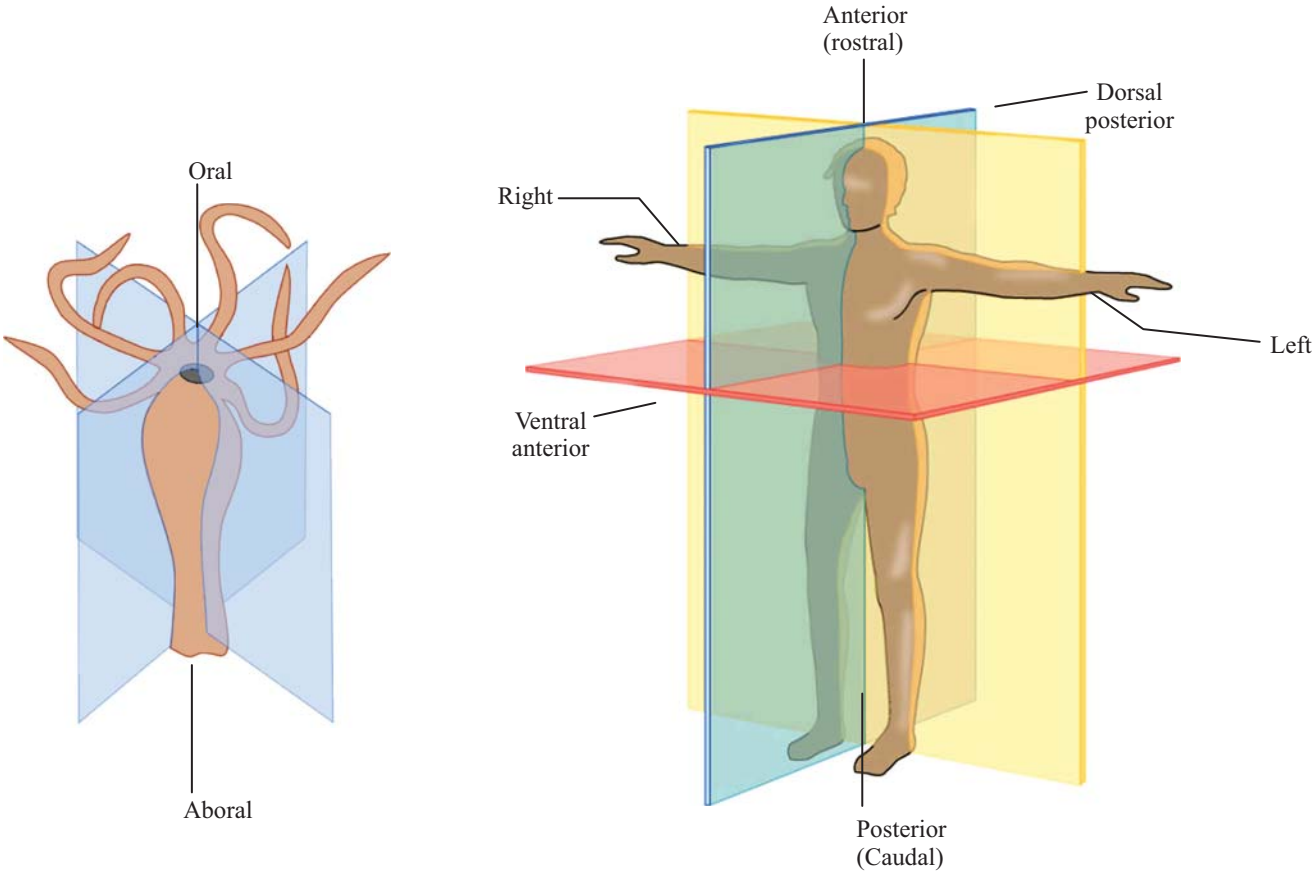


Fig.: Metagenesis in *Obelia*

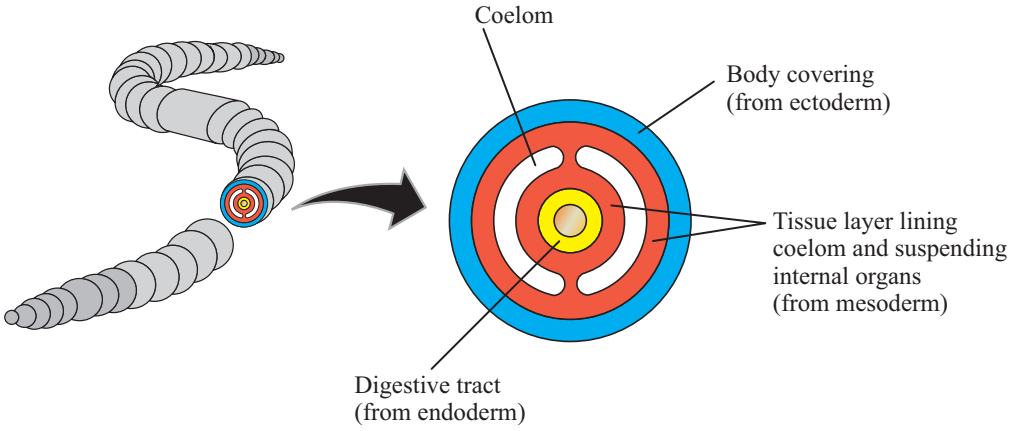


(a) Radial Symmetry **(b) Bilateral Symmetry**

Fig.: Different axis of body with symmetry (a) Radial symmetry in *Hydra*, (b) Bilateral symmetry in humans

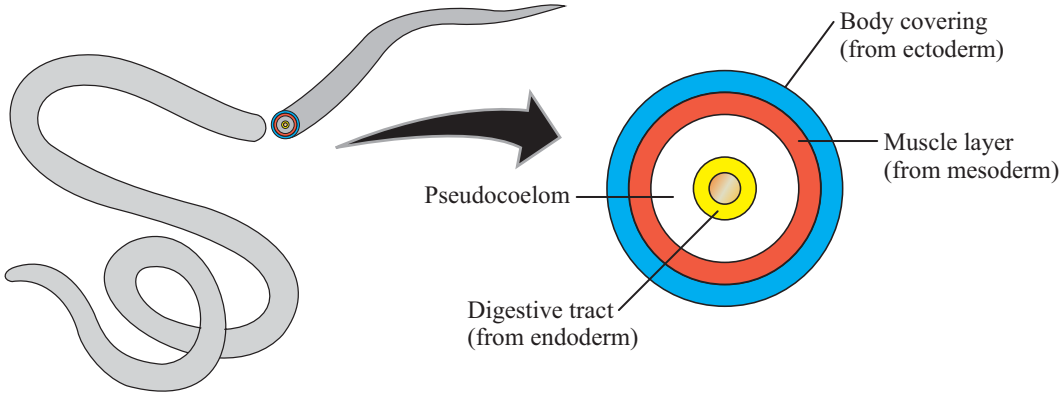
NEET Illumina

Coelomates, such as earthworms, have a true coelom, a body cavity completely lined by mesoderm.



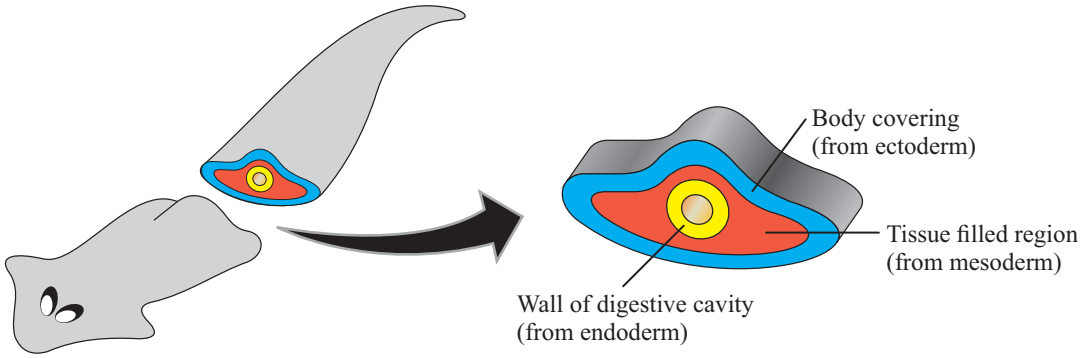
(a) Coelomate

Pseudocoelomates, such as roundworms, have a body cavity lined by tissue derived from mesoderm and by tissue derived from endoderm



(b) Pseudocoelomate

Acoelomates, such as planarians, lack a body cavity between the digestive cavity and outer body wall.



(c)Acoelomate

Key

Ectoderm Mesoderm Endoderm

Fig.: Body cavities of triploblastic animals

4. Match the columns and find out the correct combination:

Column-I		Column-II	
(a)	*Euspongia*	(i)	Spicules
(b)	*Obelia*	(ii)	Hooks and suckers
(c)	*Ctenoplana*	(iii)	Metagenesis
(d)	*Fasciola*	(iv)	Bioluminescence

1) (a)-(i) (b)-(iii) (c)-(iv) (d)-(ii)
2) (a)-(ii) (b)-(iii) (c)-(i) (d)-(iv)
3) (a)-(iii) (b)-(ii) (c)-(i) (d)-(iv)
4) (a)-(ii) (b)-(i) (c)-(iii) (d)-(iv)

5. Match the columns and choose the appropriate option.

Column-I		Column-II	
(a)	Sea walnut	(i)	Arthropoda
(b)	Scypha	(ii)	Aschelminthes
(c)	Filaria worm	(iii)	Ctenophora
(d)	*Laccifer*	(iv)	Porifera
(e)	Chiton	(v)	Mollusca

1) (a)-(iii) (b)-(iv) (c)-(ii) (d)-(i) (e)-(v)
2) (a)-(ii) (b)-(i) (c)-(iv) (d)-(iii) (e)-(v)
3) (a)-(i) (b)-(ii) (c)-(iii) (d)-(v) (e)-(iv)
4) (a)-(iv) (b)-(iii) (c)-(ii) (d)-(i) (e)-(v)

6. Match the columns and find out the correct combination:

Column-I		Column-II	
(a)	*Pinctada*	(i)	Pearl oyster
(b)	*Apis*	(ii)	Honey bee
(c)	*Sepia*	(iii)	Cuttlefish
(d)	*Limulus*	(iv)	Brittle star
(e)	*Ophiura*	(v)	King crab

1) (a)-(ii) (b)-(v) (c)-(iv) (d)-(iii) (e)-(i)
2) (a)-(iii) (b)-(iv) (c)-(ii) (d)-(i) (e)-(v)
3) (a)-(iv) (b)-(iii) (c)-(ii) (d)-(i) (e)-(v)
4) (a)-(i) (b)-(ii) (c)-(iii) (d)-(v) (e)-(iv)

7. Match the columns and find out the correct combination:

Column-I		Column-II	
(a)	Sea lily	(i)	Parapodia
(b)	Sea hare	(ii)	Malpighian tubules
(c)	Cockroach	(iii)	Water vascular system
(d)	*Nereis*	(iv)	Radula
(e)	Hookworm	(v)	Ancylostomiasis

1) (a)-(i) (b)-(ii) (c)-(iii) (d)-(v) (e)-(iv)
2) (a)-(ii) (b)-(v) (c)-(iv) (d)-(iii) (e)-(i)
3) (a)-(iii) (b)-(iv) (c)-(ii) (d)-(i) (e)-(v)
4) (a)-(iv) (b)-(iii) (c)-(ii) (d)-(i) (e)-(v)

8. Match the columns and find out the correct combination:

Column-I		Column-II	
(a)	Urochordata	(i)	*Myxine*
(b)	Cephalochordata	(ii)	*Salpa*
(c)	Cyclostomata	(iii)	Lancelet
(d)	Chondrichthyes	(iv)	*Carcharodon*

1) (a)-(ii) (b)-(iii) (c)-(i) (d)-(iv)
2) (a)-(ii) (b)-(i) (c)-(iii) (d)-(iv)
3) (a)-(i) (b)-(iii) (c)-(iv) (d)-(ii)
4) (a)-(iii) (b)-(ii) (c)-(i) (d)-(iv)

9. Match the columns and find out the correct combination:

Column-I		Column-II	
(a)	*Exocoetus*	(i)	Angel fish
(b)	*Labeo*	(ii)	Rohu
(c)	*Clarias*	(iii)	Magur
(d)	*Betta*	(iv)	Flying fish
(e)	*Pterophyllum*	(v)	Fighting fish

1) (a)-(iii) (b)-(iv) (c)-(ii) (d)-(i) (e)-(v)
2) (a)-(ii) (b)-(v) (c)-(iv) (d)-(iii) (e)-(i)
3) (a)-(iv) (b)-(ii) (c)-(iii) (d)-(v) (e)-(i)
4) (a)-(iv) (b)-(iii) (c)-(ii) (d)-(i) (e)-(v)

10. Match the columns and find out the correct combination:

Column-I		Column-II	
(a)	*Psittacula*	(i)	Parrot
(b)	*Struthio*	(ii)	Vulture
(c)	*Aptenodytes*	(iii)	Ostrich
(d)	*Neophron*	(iv)	Penguin

1) (a)-(ii) (b)-(iii) (c)-(i) (d)-(iv)
2) (a)-(ii) (b)-(i) (c)-(iii) (d)-(iv)
3) (a)-(i) (b)-(iii) (c)-(iv) (d)-(ii)
4) (a)-(iii) (b)-(ii) (c)-(i) (d)-(iv)

11. Match the columns and find out the correct combination:

Column-I		Column-II	
(a)	Coelomate	(i)	Aschelminthes
(b)	Acoelomate	(ii)	Platyhelminthes
(c)	Pseudocoelomate	(iii)	Molluscs

1) (a)-(i) (b)-(ii) (c)-(iii)
2) (a)-(ii) (b)-(i) (c)-(iii)
3) (a)-(ii) (b)-(iii) (c)-(i)
4) (a)-(iii) (b)-(ii) (c)-(i)

12. Which of the following is matching set of a phylum and its three examples?

1) Platyhelminthes - *Planaria, Schistosoma, Enterobius*
2) Mollusca - *Loligo, Sepia, Octopus*
3) Porifera - *Spongilla, Euplectella, Pennatula*
4) Cnidaria - *Bonellia, Physalia, Aurelia*

13. Select the mismatched pair.

1) *Pinctada* – Cuttlefish 2) *Aplysia* – sea hare

3) *Loligo* – Squid 4) *Pila* – Apple snail

14. Study the following organism, their character and group

(a) *Petromyzon* -Fish like but without paired fins – Agnatha

(b) Amphibia- First tetrapoda- Agnatha

(c) *Ascidia* – Notochord in larval tail only – Urochordata

(d) *Amphioxus*- Fish like burrowing- Urochordata

Which of the above two are correct?

1) (a) & (b)

2) (a) & (d)

3) (a) & (c)

4) (c) & (d)

Correct & Incorrect MCQs

1. Which one of the following statements about body cavity in certain animal groups are correct?

1) Molluscs are acoelomates

2) Insects are pseudocoelomates

3) Flatworms are coelomates

4) Roundworms are pseudocoelomates

2. Which of the given statements are correct?

(a) All vertebrates are chordates.

(b) Notochord is persistent throughout life in *Amphioxus*.

(c) In chordates, dorsal hollow nerve cord is present.

1) (a) & (b) only 2) (a) & (c) only

3) (b) & (c) only 4) (a), (b) & (c)

3. Which of the 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

1) (a) & (b) only 2) (b) & (c) only

3) (b), (c) & (d) only 4) All are correct

4. Which of the following statements about arthropods is incorrect?

1) Arthropods have an exoskeleton made of chitin.

2) Arthropods include insects, spiders, and crustaceans.

3) Arthropods have jointed appendages.

4) Arthropods are exclusively aquatic organisms.

5. Read the following statements and choose the correct statement:

1) Flatworms are mostly endoparasites.

2) In members of phylum Arthropoda excretion takes place through flame cells.

3) All the general characters of *Nereis* are similar to earthworm due to this these both are placed into the same phyla.

4) Members of mollusca have a segmented body which have distinct head, muscular foot and visceral hump.

6. Select incorrect statement from the following.

1) In vertebrates, notochord is replaced by cartilaginous or bony vertebral column

2) In cephalochordates, notochord extended from head to tail region and persistent throughout life

3) Protochordates are exclusively marine

4) Notochord is present in tail of adult in urochordata

7. Read the following statements and choose option which have correct ones only.

(a) The body of arthropods are generally consists of head, thorax and abdomen.

(b) In member of phylum Platyhelminthes, alimentary canal is complete with a well-developed muscular pharynx.

(c) Body of molluscans is unsegmented with a distinct head, muscular foot and visceral hump.

(d) In Annelids, neural system is consists of paired ganglia connected by lateral nerves to a double dorsal nerve cord.

1) (a), (b) and (d) 2) (a), (c) and (d)

3) (a) and (c) 4) (a), (b), (c) and (d)

8. Which statement is true for molluscs?

(a) These have a soft body surrounded by silica shell.

(b) Body is covered with external skeleton made of chitin.

(c) Molluscs have organ system grade of body organization with bilateral symmetry.

(d) These are oviparous with indirect development.

1) (b) and (d) 2) (c) and (d)

3) (a), (b) and (c) 4) (a), (b), (c) and (d)

9. In some chordates, the notochord is modified as the vertebral column. Such animals are called vertebrates. Which one of these statements makes sense?

1) All chordates are vertebrates, but all vertebrates are not chordates.

2) All vertebrates are chordates, and all chordates are vertebrates.

3) All vertebrates are chordates, but all chordates are not vertebrates.

4) Chordates are not vertebrates and vertebrates are not chordates.

NCERT Exemplar MCQs

1. In some animal groups, the body is found divided into compartments with at least some organs. This characteristic feature is called:

1) Segmentation 2) Metamerism
3) Metagenesis 4) Metamorphosis

2. Given below are types of cells present in some animals. Which of the following cells can differentiate to perform different functions?

1) Choanocytes 2) Interstitial cells
3) Gastrodermal cells 4) Nematocytes

3. Which one of the following sets of animals share a four chambered heart?

1) Amphibian, Reptiles, Birds
2) Crocodiles, Birds, Mammals
3) Crocodiles, Lizards, Turtles
4) Lizards, Mammals, Birds

4. Which of the following pairs of animals has non-glandular skin?

1) Snake and frog 2) *Chameleon* and turtle
3) Frog and pigeon 4) Crocodile and tiger

5. Birds and mammals share one of the following characteristics as a common feature:

1) Pigmented skin
2) Pneumatic bones
3) Viviparity
4) Warm blooded nature

6. Which one of the following sets of animals belong to a single taxonomic group?

1) Cuttlefish, jellyfish, silverfish, dogfish, starfish
2) Bat, pigeon, butterfly.
3) Monkey, chimpanzee, man
4) Silkworm, tapeworm, earthworm

7. Which one of the following statements is incorrect?

1) Mesoglea is present in between ectoderm and endoderm in *Obelia*
2) *Asterias* exhibits radial symmetry.
3) *Fasciola* is a pseudocoelomate animal
4) *Taenia* is a triploblastic animal

8. Which one of the following statements is incorrect?

1) In cockroaches and prawns, excretion of waste material occurs through Malpighian tubules.
2) In ctenophores, locomotion is mediated by comb plates.
3) In *Fasciola*, flame cells take part in excretion
4) Earthworms are hermaphrodites and yet cross fertilisation take place among them.

9. Which one of the following is oviparous?

1) Platypus 2) Flying fox (bat)
3) Elephant 4) Whale

10. Which one of the following is not a poisonous snake?

1) Cobra 2) Viper
3) Python 4) Krait

11. Match the following list of animals with their level of organisation.

Division of labour		Animal	
(a)	Organ level	(i)	*Pheretima*
(b)	Cellular aggregate level	(ii)	*Fasciola*
(c)	Tissue level	(iii)	*Spongilla*
(d)	Organ system level	(iv)	*Obelia*

Choose the correct match showing division of labour with animal example.

1) (a)-(ii) (b)-(iii) (c)-(iv) (d)-(i)
2) (a)-(ii) (b)-(iv) (c)-(iii) (d)-(i)
3) (a)-(iv) (b)-(i) (c)-(ii) (d)-(iii)
4) (a)-(i) (b)-(iv) (c)-(iii) (d)-(ii)

12. Body cavity is the cavity present between body wall and gut wall. In some animals, the body cavity is not lined by mesoderm. Such animals are called:

1) Acoelomate 2) Pseudocoelomate
3) Coelomate 4) Haemocoelomate

13. Match the column I with column II and choose the correct option.

Column I		Column II	
(a)	Porifera	(i)	Canal system
(b)	Aschelminthes	(ii)	Water vascular system
(c)	Annelida	(iii)	Muscular Pharynx
(d)	Arthropoda	(iv)	Jointed appendages
(e)	Echinodermata	(v)	Metameres

1) (a)-(ii) (b)-(iii) (c)-(v) (d)-(iv) (e)-(i)
2) (a)-(ii) (b)-(v) (c)-(iii) (d)-(iv) (e)-(i)
3) (a)-(i) (b)-(iii) (c)-(v) (d)-(iv) (e)-(ii)
4) (a)-(i) (b)-(v) (c)-(iii) (d)-(iv) (e)-(ii)

NCERT Line by Line Fill-UP and True & False

Basis of Classification

1. The classification helps in assigning a systematic position to newly described species. T/F
2. In sponges, the cells are arranged as loose cell aggregates, i.e., they exhibit cellular level of organisation. T/F
3. In coelenterates, the arrangement of cells is less complex than that of sponges. T/F
4. Organ systems in different groups of animals exhibit similar patterns of complexities. T/F
5. A differentiated layer, mesoglea, is present in between the ectoderm and the endoderm. T/F
6. Notochord is a mesodermally derived rod-like structure formed on the ventral side during embryonic development in some animals. T/F

Classification of Animals

7. Members of porifera phylum are commonly known as _____ .
8. Sponges are generally marine and all are asymmetrical animals. T/F
9. Collar cells are also known as _____ .
10. Collar cells in sponges line the osculum and the canals. T/F
11. Sponges reproduce asexually by _____ and sexually by _____ .
12. In sponges, fertilisation is external and development is indirect having a larval stage which is morphologically distinct from the adult. T/F
13. Coelenterates are also known as _____ .
14. Stinging Capsule in chidarians is also known as _____ .
15. Cnidarians have a lateral oral-gastro cavity with a single opening, mouth on hypostome. T/F
16. Cnidarians exhibit two basic body forms called _____ and _____ .
17. In Cnidarians, the polyp is a sessile and cylindrical form like *Hydra*, *Aurelia*, etc. T/F
18. In *Obelia*, Polyps produce medusae sexually and medusae form the polyps asexually. T/F
19. Ctenophores are commonly known as_____ or _____ .
20. Ctenophores are inclusively marine, bilaterally symmetrical, diploblastic organisms with tissue level of organisation. T/F
21. The body of ctenophores bears ten external rows of ciliated comb plates. T/F
22. Digestion in ctenophores is only extracellular. T/F
23. Bioluminescence is well-marked in ctenophores. T/F
24. In ctenophores, fertilisation is internal with indirect development. T/F
25. Platyhelminthes have dorso-ventrally flattened body thus, it is also known as _____ .
26. Platyhelminthes are mostly ectoparasites found in animals including human beings. T/F
27. Flatworms are bilaterally symmetrical, triploblastic and coelomate animals with organ level of organisation. T/F
28. In Platyhelminthes, hooks and suckers are present in the parasitic forms. T/F
29. In platyhelminthes, specialised cells called protonephridia help in osmoregulation and excretion. T/F
30. Some members of platyhelminthes like _____ possess high regeneration capacity.
31. The body of aschelminthes look _____ in cross-section.
32. Roundworms have _____ level of body organisation.
33. Aschelminthes are bilaterally symmetrical, triploblastic and acoelomate animals. T/F
34. In aschelminth, an excretory tube removes body wastes from the body cavity through the excretory pore. T/F
35. In aschelminthes, often males are longer than females. T/F
36. *Ascaris* is also known as _____ .
37. Annelids exhibit _____ level of body organisation and _____ symmetry.
38. Annelids are triploblastic, metamerically segmented and pseudocoelomate animals. T/F
39. Annelids possess lateral and circular muscles which help in locomotion. T/F
40. *Nereis* possess lateral appendages that is known as _____ .
41. In annelids, neural system consists of paired ganglia connected by ventral nerves to a double dorsal nerve cord. T/F
42. *Nereis*, an aquatic form, is monoecious, but earthworms and leeches are dioecious. T/F
43. Over one-third of all named species on earth are arthropods. T/F
44. Statocysts are also known as _____ .
45. Excretion in arthropods takes place through _____ .
46. Arthropods are mostly viviparous. T/F
47. _____ is known as living fossil.
48. Mollusca is the third largest animal phylum. T/F
49. Molluscs are bilaterally symmetrical, triploblastic and acoelomate animals. T/F
50. Body of molluscs is covered by a calcareous shell and is segmented with a distinct head, muscular foot and visceral hump. T/F
51. Molluscs have a soft and calcareous layer of skin forms a mantle over the visceral hump. T/F
52. In molluscs, the anterior head region has sensory tentacles. T/F

MCQs

NCERT Topic-wise MCQs

Classification

1. Which of the following is odd one w.r.t. organ system level of body organisation?
1) Platyhelminthes 2) Arthropods
3) Annelids 4) Molluscs

2. Pseudocoelomates animals are:
1) Aschelminthes 2) Humans
3) Platyhelminthes 4) None of these

3. Radial symmetry occurs in:
1) Platyhelminthes 2) Cnidaria
3) Molluscs 4) Sponges

4. True coelom is lined by:
1) Ectoderm 2) Mesoderm
3) Endoderm 4) Ectoderm and endoderm

5. In which phylum the body can be divided into identical left and right halves in only one plane?
1) Coelenterata 2) Annelida
3) Ctenophora 4) Echinodermata

6. Organization in sponges is
1) Protoplasmic grade 2) Cellular grade
3) Organ grade 4) Tissue grade

7. Diploblastic and triploblastic are terms that describe
1) The number of invaginations during embryonic development
2) The number of heads during embryonic development
3) The number of germinal layers during embryonic development
4) The number of cell types during development

Porifera

8. In most simple type of canal system of porifera, which of the following ways exhibit water flow?
1) Ostia → Spongocoel → Osculum →Exterior
2) Spongocoel → Ostia → Osculum → Exterior
3) Osculum → Spongocoel → Ostia → Exterior
4) Osculum → Ostia → Spongocoel → Exterior

9. Fresh water sponge is:
1) *Euspongia* 2) *Cliona*
3) *Spongilla* 4) *Euplectella*

10. Skeleton of porifera is made up of
1) Spongin fibres 2) Collagen
3) Calcium carbonate 4) Calcareous ossicles

11. In sponges, water enters through minute pores (ostia) in the body wall into a central cavity, spongocoel, from where it goes out through the osculum. This pathway of water transport is helpful in
1) Food gathering 2) Respiratory exchange
3) Removal of waste 4) All of these

12. Which of the following is not the characteristic of *Euspongia*?
1) Hermaphrodite nature 2) Choanocytes
3) External fertilisation 4) Indirect development

13. *Euspongia* is commonly known as
1) Marine water sponge 2) Bath sponge
3) Fresh water sponge 4) Terrestrial sponge

14. Canal system is present in:
1) Cnidaria 2) Coelenterata
3) Porifera 4) Echinodermata

15. One of the following is not the characteristic feature of sponges
1) Cellular level of organisation
2) Body supported by chitin
3) Presence of ostia
4) Intracellular digestion

Coelenterata

16. Which among the following exhibit alternation of generation?
1) *Physalia* 2) *Obelia*
3) *Hydra* 4) *Aurelia*

17. Which of the following traits is not shared by both sea anemones and jelly fish?
1) A medusa as the dominant stage in the life cycle
2) Presence of a central gastro-vascular cavity
3) Exhibit tissue level of organisation
4) Nematocysts on the tentacles

18. Polyp phase is absent in
1) *Aurelia* 2) *Hydra*
3) *Adamsia* 4) *Obelia*

ANSWERS

1. True
2. True
3. False: In coelenterates, the arrangement of cells is more complex than that of sponges.
4. False: Organ systems in different groups of animals exhibit various patterns of complexities.
5. False: An undifferentiated layer, mesoglea, is present in between the ectoderm and the endoderm.
6. False: Notochord is a mesodermally derived rod-like structure formed on the dorsal side during embryonic development in some animals.
7. Sponges
8. False: Sponges are generally marine and mostly asymmetrical animals.
9. Choanocytes
10. False: Collar cells line the spongocoel and the canals.
11. Fragmentation, Formation of gametes
12. False: In Sponges, fertilisation is internal and development is indirect having a larval stage which is morphologically distinct from the adult
13. Cnidaria
14. Nematocyst
15. False: Cnidarians have a central gastro-vascular cavity with a single opening, mouth on hypostome.
16. Polyp, medusa
17. False: The polyp is a sessile and cylindrical form like *Hydra*, *Adamsia*, etc
18. False: In *Obelia* polyps produce medusae asexually and medusae form the polyps sexually.
19. Sea walnuts, comb jellies
20. False: Ctenophores are exclusively marine, radially symmetrical, diploblastic organisms with tissue level of organisation.
21. False: The body of ctenophores bears eight external rows of ciliated comb plates.
22. False: Digestion is both extracellular and intracellular in Ctenophores.
23. True
24. False: In Ctenophores, fertilisation is external with indirect development.
25. Flatworms
26. False: Platyhelminthes are mostly endoparasites found in animals including human beings.
27. False: Flatworms are bilaterally symmetrical, triploblastic and acoelomate animals with organ level of organisation.
28. True
29. False: Specialised cells called flame cells help in osmoregulation and excretion in platyheminthes.
30. *Planaria*
31. Circular
32. Organ-system
33. False: Aschelminthes are bilaterally symmetrical, triploblastic and pseudocoelomate animals.
34. True
35. False: In Aschelminthes, females are longer than males.
36. Roundworm
37. Organ-system, bilateral
38. False: Annelids are triploblastic, metamerically segmented and coelomate animals.
39. False: Annelids possess longitudinal and circular muscles which help in locomotion.
40. Parapodia
41. False: In Annelids, neural system consists of paired ganglia connected by lateral nerves to a double ventral nerve cord.
42. False: *Nereis*, an aquatic form, is dioecious, but earthworms and leeches are monoecious.
43. False: Over two-thirds of all named species on earth are arthropods.
44. Balancing organ
45. Malpighian tubules
46. False: Arthropods are mostly oviparous.
47. *Limulus* (king crab)
48. False: Mollusca is the second largest animal phylum.
49. False: Molluscs are bilaterally symmetrical, triploblastic and coelomate animals
50. False: Body of molluscs are covered by a calcareous shell and is unsegmented with a distinct head, muscular foot and visceral hump.
51. False: A soft and spongy layer of skin forms a mantle over the visceral hump in molluscs.
52. True
53. False: Molluscs are usually dioecious and oviparous with indirect development.
54. False: Echinoderms have an endoskeleton of calcareous ossicles.

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BOOK FOR COMPETITIVE EXAMS (NEET | JEE | CUET)

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MCQs Extracted from NCERT Line by Line

PHYSICS

Highlighted Rationalised Content as per Latest NCERT

Dr. Manish Raj (M.R. Sir)

About the Editor

Dr. Manish Raj, from **Bihar**, Popularly known as **M.R. sir** amongst his students is **renowned faculty of physics at PW** with **11 years** of teaching experience. He received his education from university of Delhi.

Till now he has taught **1.5 million** students and still counting.

He is recognized nationally for his teaching style and has great influence as a professor of physics. Mentor of AIR 24, 28, 39, 42, 59, 67 in NEET and many more.

INKZOID FOUNDATION honours him as **'The Star Teacher Of The Year 2022'** for teaching complete NEET Physics on alternate days for the **longest time duration** of 24 hours on YouTube.

Contributors

We extend our heartfelt gratitude to our team members: **Raunak Jha, Anil Kumar, Sandeep Gangwar, Dharmendra Kumar, Chetan Pali** and **Vandana Dubey**. Their invaluable contributions have enriched the very essence of our books.

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Samuel Harshith
NEET AIR-24

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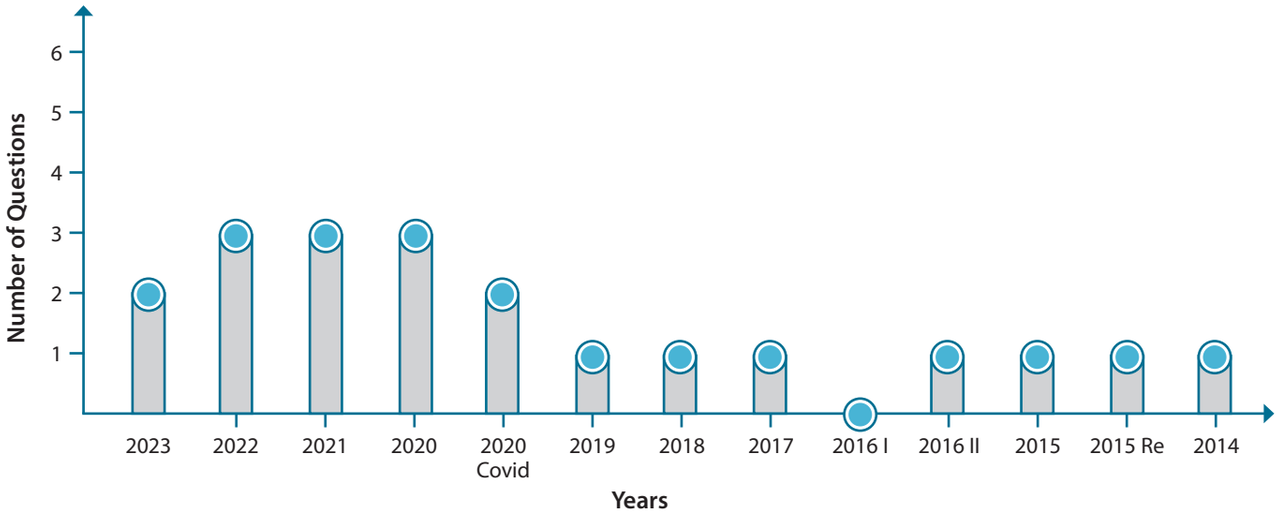
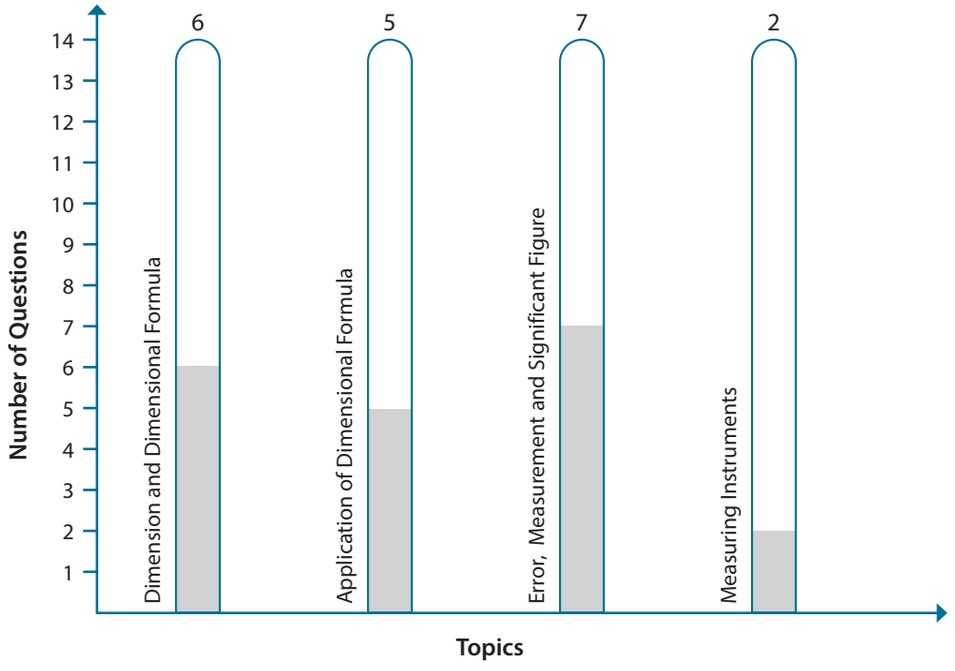
CHAPTER

1 Units & Dimensions

Year Wise Number of Questions Analysis (2023-2014)



Topicwise Number of Questions Analysis (2023-2014)



Physical Constants

- Mass of electron (m_e) = 9.109×10^{-31} kg
- Mass of proton (m_p) = 1.6726×10^{-27} kg
- Mass of a neutron (m_n) = 1.6749×10^{-27} kg
- Charge of an electron (e) = -1.602×10^{-19}C
- Speed of light in vacuum (c) = 3×10^8 m/s
- Planck's constant (h) = 6.626×10^{-34} J -s
- Universal Gravitational constant (G) = 6.67×10^{-11} Nm^2/kg^2
- Avogadro's Number (N_A) = 6.022×10^{23} mol^{-1}
- Boltzmann constant (k_B) = 1.38×10^{-23} J/K
- Stefan's constant (σ) = 5.67×10^{-8} W m^{-2} K^{-4}
- Wien's constant (b) = 2.898×10^{-3} m K
- Solar constant (S) = 1.366×10^3 W m^{-2}
- Mass of the sun (M_S) = 1.989×10^{30} kg
- Mass of the earth (M_E) = 5.97×10^{24} kg
- Radius of the earth (R_e) = 6371 km $\approx 6.4 \times 10^6$ m
- Density of earth = 5.513×10^3 kg/m^3
- Average angular velocity of the earth = 7.29×10^{-5} rad/s
- Average distance between the Sun and the Earth (AU) = 1.496×10^{11} m
- Average distance between moon and the earth = 3.844×10^8m
- Magnetic Moment of the earth = 8.22×10^{22} A - m^2

Conversion Coefficients

- 1 Light year = 9.46×10^{15} m.
- 1 A.U. = 1.496×10^{11} m.
- 1 Å = 10^{-10} m.
- 1 Fermi = 10^{-15} m.
- 1 eV = 1.6×10^{-19} Joule.
- 1 Horse Power = 746 Watt.

System of Units

Formulas

- System of Units:
  (a) C.G.S = Centimeter-Gram-Second
  (b) F.P.S = Foot-Pound-Second
  (c) M.K.S = Meter-Kilogram-Second
  (d) M.K.S.A = Meter-Kilogram-Second-Ampere

Quantity	Unit	Symbol of Unit
Length	metre	m
Mass	kilogram	kg
Time	second	s
Temperature	kelvin	k
Electric current	ampere	A
Number of particles	mole	mol
Luminous intendity	candela	cd

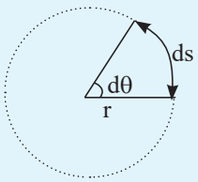
Quantity	Unit	Symbol of Unit
Plane angle	radian	rad
Solid angle	steradian	Sr

Pressure difference between hydrostatic and atmospheric pressure is known as gauge pressure.

Numerical Profile

Plane Angle:

Angle substended by an arc at the centre of a circle



$$d\theta = \frac{ds}{r} = \frac{arc}{radius}$$

(i) Conversion of degree into radian:

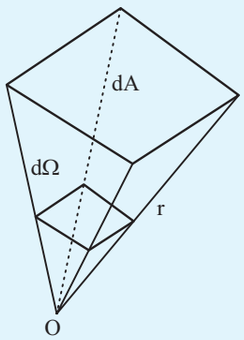
$$1° = \frac{\pi}{180} rad$$

(ii) Conversion of degree into minutes or seconds:

$$1° = \frac{\pi}{180} rad = (60)' = (3600)''$$

where,' = minute, " = second

Solid Angle:



Solid angle, $d\Omega = \frac{dA}{r^2}$

Where, dA = intercepted area of spherical surface
r = radius of the sphere
$d\Omega$ = solid angle

Applications of Dimensions

Formulas

1. To check the correctness of an equation
   Dimensions on LHS = Dimensions on RHS
2. Conversion of one system of units into another system, we use

$$n_2 = n_1 \left(\frac{M_1}{M_2}\right)^a \left(\frac{L_1}{L_2}\right)^b \left(\frac{T_1}{T_2}\right)^c$$

[n_2 and n_1 is the numerical values in the two systems]

MCQs

NCERT Topic-wise MCQs

Units, System of Units

1. Which of the following is not the unit of time?

1) Solar day 2) Parallactic second
3) Leap year 4) Lunar month

2. A unit less quantity

1) Never has a non zero dimension
2) Always has a non zero dimension
3) May have a non zero dimension
4) Does not exit

3. Which of the following is not the name of a physical quantity?

1) Kilogram 2) Impulse
3) Energy 4) Density

4. Parsec is a unit of

1) Time 2) Angle
3) Distance 4) Velocity

5. Which of the following system of units is not based on the unit of mass, length and time alone

1) FPS 2) SI
3) CGS 4) MKS

Dimensions & Dimensional Formulas

6. The dimensions of magnetic moment are:

1) L^2A^{-1} 2) L^2A^1
3) LA^2 4) L^2A^{-3}

7. The velocity V of a particle is given in terms of time t as $V = at + \frac{b}{t+C}$.

The dimensions of a, b, c are:

1) L^2; MLT^{-2} 2) LT^2; LT; L
3) LT^{-2}; L; T 4) L; LT; T^2

8. In a particular system, the unit of length, mass and time are chosen to be 10 cm, 10 g and 0.1 s respectively. The unit of force in this system will be equivalent to:

1) 0.1 N 2) 1 N
3) 10 N 4) 100 N

9. The time dependence of a physical quantity P is given by $P = P_0 \exp(-\alpha t^2)$, where α is a constant and t is time. The constant α:

1) Is dimensionless 2) Has dimensions T^{-2}
3) Has dimensions of P 4) Has dimensions T^2

10. A unitless quantity:

1) May have a dimensions
2) Always has a dimensions
3) Never has a dimensions
4) Does not exist

11. Which of the following sets cannot enter into the list of fundamental quantities in any system of units?

1) Length, time and velocity
2) Length, mass and velocity
3) Mass, time and velocity
4) Length, time and mass

12. A dimensionless quantity:

1) May have a unit 2) Never has a unit
3) Always has a unit 4) Doesn't exist

13. The position x of a particle at time t is given by-

$$x = \frac{v_0}{a}\left(1 - e^{-at}\right)$$

where v_0 is a constant and $a > 0$.

The dimensions of v_0 and a are:

1) $M^0 L T^{-1}$ and T^{-1} 2) $M^0 L T^0$ and T^{-1}
3) $M^0 L T^{-1}$ and LT^{-2} 4) $M^0 L T^{-1}$ and T

14. The dimensions of intensity are:

1) $M^1 L^0 T^{-3}$ 2) $M^2 L^1 T^{-2}$
3) $M^1 L^2 T^{-2}$ 4) $M^2 L^0 T^{-3}$

15. Which one of the following are the dimensions of pressure?

1) $\frac{ML}{T^2}$ 2) $\frac{M}{L^2T^2}$
3) $\frac{M}{LT^2}$ 4) $\frac{M}{LT}$

16. The dimensions of RC, where R is resistance and C is capacitance are same as that of:

1) Inverse of time 2) Time
3) Square of time 4) Square root of time

Rank Booster MCQs

1. The relation $p = \frac{\alpha}{\beta} e^{\frac{-\alpha Z}{k\theta}}$ where p is pressure, Z is distance, k is Boltzmann constant and θ is temperature. The dimensional formula of β will be:

1) $[M^0L^2T^0]$ 2) $[ML^2T]$
3) $[ML^0T^{-1}]$ 4) $[M^0L^2T^{-1}]$

2. From the dimensional consideration, which of the following equations is correct?

1) $T = 2\pi\sqrt{\frac{R^3}{GM}}$ 2) $T = 2\pi\sqrt{\frac{GM}{R^3}}$
3) $T = 2\pi\sqrt{\frac{GM}{R^2}}$ 4) $T = 2\pi\sqrt{\frac{R^2}{GM}}$

3. A uniform wire of length L, diameter D and density ρ is stretched under a tension T. The correct relation between its fundamental frequency f, the length L and the diameter D is:

1) $f \propto \frac{1}{LD}$ 2) $f \propto \frac{1}{L\sqrt{D}}$
3) $f \propto \frac{1}{D^2}$ 4) $f \propto \frac{1}{LD^2}$

4. The speed of light c, gravitational constant G and Planck's constant h are taken as fundamental quantities in a system. The dimensions of time in this new system should be:

1) $[G^{1/2}h^{1/2}c^{-5/2}]$ 2) $[G^{-1/2}h^{1/2}c^{1/2}]$
3) $[G^{-1/2}h^{1/2}c^{-3/2}]$ 4) $[G^{-1/2}h^{1/2}c^{1/2}]$

5. If E = energy, G = gravitational constant, I = impulse and M = mass, then dimensions of $\frac{GIM^2}{E^2}$ are same as that of

1) Time 2) Mass
3) Length 4) Force

6. The dimensions of $\frac{e^2}{4\pi\varepsilon_0 hc}$ are (where e, ε_0, h and c are electric charge, electric permittivity, Planck's constant and velocity of light in vacuum respectively):

1) $[M^0L^0T^0]$ 2) $[ML^0T^0]$
3) $[M^0LT^0]$ 4) $[M^0L^0T]$

7. When a metal block is hanged from a spring balance, it reads 5.00 ± 0.05 N. While in water, it reads 4.00 ± 0.05 N. The relative density would be quoted as:

1) 5.00 ± 0.05 2) 5.00 ± 11%
3) 5.00 ± 0.10 4) 5.00 ± 6%

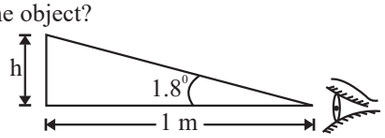
8. A gas bubble formed from an explosion under water oscillates with a period T proportional to $p^a d^b E^c$, where p is pressure, d is the density of water and E is the total energy of explosion. The values of a, b and c are

1) a = 1, b = 1, c = 2 2) a = 1, b = 2, c = 1
3) $a = \frac{5}{6}, b = \frac{1}{2}, c = \frac{1}{3}$ 4) $a = -\frac{5}{6}, b = \frac{1}{2}, c = \frac{1}{3}$

9. A physical quantity x is given by $x = \frac{2k^3l^2}{m\sqrt{n}}$. The percentage error in the measurements of k, l, m and n are 1%, 2%, 3% and 4% respectively. The value of x is uncertain by:

1) 8% 2) 10%
3) 12% 4) None of these

10. A normal human eye can see an object making an angle of 1.8° at the eye. What is the minimum height of object which can be seen by an eye placed at a distance of 1 m from the object?



1) π cm 2) 2π cm
3) 4π cm 4) 3π cm

11. Consider the equation $\frac{d}{dt}\left(\int \vec{F}\cdot d\vec{S}\right) = A\left(\vec{F}\cdot\vec{p}\right)$ where $\vec{F}$ = force, $\vec{s}$ = displacement, t = time and $\vec{p}$ = momentum. The dimensional formula of A will be :

1) $M^0L^0T^0$ 2) ML^0T^0
3) $M^{-1}L^0T^0$ 4) $M^0L^0T^{-1}$

12. A uniform wire of length L and mass M is stretched between two fixed points, keeping a tension F. A sound of frequency μ is impressed on it. Then the maximum vibrational energy is existing in the wire when μ=

1) $\frac{1}{2}\sqrt{\frac{ML}{F}}$ 2) $\sqrt{\frac{FL}{M}}$
3) $2\sqrt{\frac{FM}{L}}$ 4) $\frac{1}{2}\sqrt{\frac{F}{ML}}$

13. If P, Q, R are physical quantities, having different dimensions, which of the following combinations can never be a meaningful quantity?

1) $\frac{(P-Q)}{R}$ 2) PQ – R
3) $\frac{PQ}{R}$ 4) $\frac{(PR-Q^2)}{R}$

14. Given that the displacement of an oscillating particle is y = A sin(Bx + Ct + D). The dimensional formula for (ABCD) is:

1) $[M^0L^{-1}T^0]$ 2) $[M^0L^0T^{-1}]$
3) $[M^0L^{-1}T^{-1}]$ 4) $[M^0L^0T^0]$

15. The dimensions of a/b in the equation $P = \frac{a - t^2}{bx}$, where P is pressure, x is distance and t is time, are:

1) $[M^2 L T^{-3}]$ 2) $[MT^{-2}]$
3) $[LT^{-3}]$ 4) $[ML^3 T^{-1}]$

16. If the units of length , velocity and force are halved, then the units of power will be :

1) Doubled 2) Halved

3) $\frac{1}{4}$th 4) Unaffected

17. Suppose mass, velocity & time were fundamental physical quantities then find the dimensional formula of pressure.

1) $[M^1V^{-1}T^{-2}]$ 2) $[M^1V^{-1}T^{-3}]$

3) $[M^1V^{-2}T^{-3}]$ 4) $[M^2V^{-2}T^{-3}]$

18. Force F and density d are related as $F = \frac{\alpha}{\beta + \sqrt{d}}$ then find the dimensions of α:

1) $[M^{1/2}L^{-1/2}T^{-2}]$ 2) $[M^{3/2}L^{1/2}T^2]$

3) $[M^{3/2}L^{-1/2}T^{-2}]$ 4) $[M^2L^{-1/2}T^2]$

19. Frequency is the function of density (ρ), length (a) and surface tension (T). Frequency is equal to:

1) $\frac{k\rho^{1/2}a^{3/2}}{\sqrt{T}}$ 2) $\frac{k\rho^{3/2}a^{3/2}}{\sqrt{T}}$

3) $\frac{k\rho^{1/2}a^{3/2}}{T^{3/4}}$ 4) None of these

20. According to Newton, the viscous force acting between liquid layers of area A and velocity gradient $\frac{\Delta V}{\Delta Z}$ is given by $F = -\eta A\frac{\Delta V}{\Delta Z}$, where η is a constant called as coefficient of viscosity. The dimensional formula of η is:

1) $[ML^{-2}T^{-2}]$ 2) $[M^0L^0T^0]$

3) $[ML^2T^2]$ 4) $[ML^{-1}T^{-1}]$

21. A liquid of coefficient of viscosity η is flowing steadily through a capillary tube of radius r and length *l*. If V is volume of liquid flowing per second, the pressure difference P between the ends of tube is given by:

1) $P = \frac{8\pi lV}{\eta r^4}$ 2) $P = \frac{8\eta r^4 l}{\pi V}$

3) $P = \frac{8\eta lV}{\pi r^4}$ 4) $P = \frac{8\eta r^4 V}{\pi l}$

22. Given that $\int \frac{dx}{\sqrt{2ax - x^2}} = a^n \sin^{-1}\left(\frac{x - a}{a}\right)$

where a = constant. Using dimensional analysis, the value of n is-

1) 1 2) –1

3) 0 4) None of the above

23. Given: $\text{Force} = \frac{\alpha}{\text{density} + \beta^3}$. What are the dimensions of α and β?

1) $ML^{-2}T^{-2}$, $ML^{-1/3}$

2) $M^2L^4T^{-2}$, $M^{-1/3}L^{-1}$

3) $M^2L^{-2}T^{-2}$, $M^{1/3}L^{-1}$

4) $M^2L^{-2}T^{-2}$, ML^{-3}

Statement Based MCQs

Directions: These questions consist of two statements each, printed as Statement-I and Statement-II. While answering these questions, you are required to choose any one of the following four responses.

1) Both Statement-I and Statement-II are correct.

2) Both Statement-I and Statement-II are incorrect.

3) Statement-I is correct & Statement-II is incorrect.

4) Statement-I is incorrect & Statement-II is correct.

1. Statement-I: The units of some physical quantities can be expressed as combination of the base units.

Statement-II: We need only a limited number of units for expressing the derived physical quantities.

2. Statement-I: The number 1.202 has four significant figures and the number 0.0024 has two significant figures.

Statement-II: All the non zero digits are significant.

3. Statement-I: All physical quantities can be added or subtracted.

Statement-II: The physical quantities should not have same dimensions for addition and subtraction.

4. Statement-I: Let us consider an equation $1/2\ mv^2 = mgh$ where, m is the mass of the body, v is velocity, g is the acceleration due to gravity and h is the height. This equation is dimensionally correct.

Statement-II: All dimensionally correct equations are correct.

5. Statement-I: The given equation $x = x_0 + u_0t + \frac{1}{2}at^2$ is dimensionally correct, where x is the distance travelled by a particle in time t, x_0 is initial position, u_0 is initial velocity and a is uniform acceleration along the line of motion.

Statement-II: Dimensional analysis can be used for checking the dimensional consistency or homogeneity of the equation.

Assertion & Reason MCQs

Directions: These questions consist of two statements each, printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses.

1) **Both Assertion and Reason are True and the Reason is a correct explanation of the Assertion.**
2) **Both Assertion and Reason are True but Reason is not a correct explanation of the Assertion.**
3) **Assertion is True but the Reason is False.**
4) **Assertion is False but Reason is True.**

1. **Assertion:** Parallax method can be used for measuring distances of heavenly bodies more than 100 light years away.
   Reason: For a distance more than 100 light years, parallax angle is reduced to such an extent that it cannot be measured accurately.

2. **Assertion:** Light year is the distance that light travels with velocity of 3×10^8 m s^{-1} in one year.
   Reason: Light year is the unit for measuring time.

3. **Assertion:** Dimensions of Planck's constant is equal to the dimensions of angular momentum.
   Reason: Dimensions of work are ML^2T^{-2}.

4. **Assertion:** A dimensionally wrong or inconsistent equation must be wrong.
   Reason: A dimensionally consistent equation is a correct equation.

5. **Assertion:** When the units of measurement of a quantity are changed, its numerical value changes.
   Reason: Smaller the unit of measurement, smaller is its numerical value.

Match the Columns MCQs

1. If R is resistance, L is inductance, C is capacitance, H is latent heat and s is specific heat, then match the quantity given in column-I with the dimensions given in column-II

Column-I		Column-II	
(a)	LC	(i)	$[L^2T^{-2}]$
(b)	LR	(ii)	$[L^2T^{-2}K^{-1}]$
(c)	H	(iii)	$[T^{-2}]$
(d)	s	(iv)	$[M^2L^4T^{-5}A^{-4}]$

1) (a)-(iii) (b)-(i) (c)-(iv) (d)-(ii)
2) (a)-(iii) (b)-(iv) (c)-(i) (d)-(ii)
3) (a)-(i) (b)-(iii) (c)-(ii) (d)-(iv)
4) (a)-(iv) (b)-(ii) (c)-(iii) (d)-(i)

2. There are four vernier scales; whose specifications are given in column I and the least count is given in column II. Match the column-I and II with correct specification and corresponding least count (s = value of main scale division, n = number of marks on vernier)

Column-I		Column-II	
(a)	s = 1 mm, n = 10	(i)	0.05 mm
(b)	s = 0.5 mm, n = 10	(ii)	0.01 mm
(c)	s = 0.5 mm, n = 20	(iii)	0.1 mm
(d)	s = 1 mm, n = 100	(iv)	0.025 mm

1) (a)-(i) (b)-(iii) (c)-(ii) (d)-(iv)
2) (a)-(iv) (b)-(i) (c)-(iii) (d)-(ii)
3) (a)-(ii) (b)-(iv) (c)-(iii) (d)-(i)
4) (a)-(iii) (b)-(i) (c)-(iv) (d)-(ii)

NCERT Exemplar MCQs

1. The number of significant figures in 0.06900 is:
   1) 5 2) 4
   3) 2 4) 3

2. The sum of the numbers 436.32, 227.2 and 0.301 in appropriate significant figures is:
   1) 663.821
   2) 664
   3) 663.8
   4) 663.82

3. The mass and volume of a body are 4.237 g and 2.5 cm^3, respectively. The density of the material of the body in correct significant figures is:
   1) 1.6048 g cm^{-3} 2) 1.69 g cm^{-3}
   3) 1.7 g cm^{-3} 4) 1.695 g cm^{-3}

4. The numbers 2.745 and 2.735 on rounding off to 3 significant figures will give:
   1) 2.75 and 2.74 2) 2.74 and 2.73
   3) 2.75 and 2.73 4) 2.74 and 2.74

5. The length and breadth of a rectangular sheet are 16.2 cm and 10.1 cm, respectively. The area of the sheet in appropriate significant figures and error is:

1) $164 \pm 3\ cm^2$
2) $163.62 \pm 2.6\ cm^2$
3) $163.6 \pm 2.6\ cm^2$
4) $163.62 \pm 3\ cm^2$

6. Which of the following pairs of physical quantities does not have same dimensional formula?

1) Work and torque
2) Angular momentum and Planck's constant
3) Tension and surface tension
4) Impulse and linear momentum

7. Measure of two quantities along with the precision of respective measuring instruments is:

$A = 2.5\ ms^{-1} \pm 0.5\ ms^{-1}$, $B = 0.10\ s \pm 0.01\ s$. The value of AB will be:

1) (0.25 ± 0.08) m
2) (0.25 ± 0.5) m
3) (0.25 ± 0.05) m
4) (0.25 ± 0.135) m

8. You measure two quantities as $A = 1.0\ m \pm 0.2\ m$, $B = 2.0\ m \pm 0.2\ m$. We should report correct value for $\sqrt{AB}$ as:

1) $1.4\ m \pm 0.4\ m$
2) $1.41\ m \pm 0.15\ m$
3) $1.4\ m \pm 0.3\ m$
4) $1.4\ m \pm 0.2\ m$

9. Which of the following measurements is most precise?

1) 5.00 mm
2) 5.00 cm
3) 5.00 m
4) 5.00 km

10. The mean length of an object is 5 cm. Which of the following measurements is most accurate?

1) 4.9 cm
2) 4.805 cm
3) 5.25 cm
4) 5.4 cm

11. Young's modulus of steel is $1.9 \times 10^{11}\ N\ m^2$. When expressed in CGS units of dyne/cm^2, it will be equal to: ($1\ N = 10^5$ dyne, $1\ m^2 = 10^4\ cm^2$)

1) 1.9×10^{10}
2) 1.9×10^{11}
3) 1.9×10^{12}
4) 1.9×10^{13}

12. If momentum (p), area (A) and time (T) are taken to be fundamental quantities, then energy has the dimensional formula:

1) $[pA^{-1}T^1]$
2) $[p^2AT]$
3) $[pA^{-1/2}T]$
4) $[pA^{1/2}T^1]$

13. Photon is quantum of radiation with energy $E = h\nu$, where ν is frequency and h is Planck's constant. The dimensions of h are the same as that of:

1) Linear impulse
2) Angular impulse
3) Linear momentum
4) Angular momentum

14. If Planck's constant (h) and speed of light in vacuum (c) are taken as two fundamental quantities, which one of the following can, in addition, be taken to express length, mass and time in terms of the three chosen fundamental quantities?

1) Mass of electron (m_e)
2) Universal gravitational constant (G)
3) Charge of electron (e)
4) Mass of proton (m_p)

15. Which of the following ratios express pressure?

1) Force/Area
2) Energy/Volume
3) Energy/Area
4) Force/Volume

16. Which of the following is not a unit of time?

1) Second
2) Parsec
3) Year
4) Light year

Past 5 Years MCQs

1. Plane angle and solid angle have : **(2022)**

1) Both units and dimension
2) Units but no dimensions
3) Dimensions but no units
4) No units and no dimensions

2. The dimension $[MLT^{-2}A^{-2}]$ belong to the : **(2022)**

1) Electric permittivity
2) Magnetic flux
3) Self inductance
4) Magnetic permeability

3. The area of a rectangular field (in m^2) of length 55.3 m and breadth 25 m after rounding off the value for correct significant digits is : **(2022)**

1) 14×10^2
2) 138×10^1
3) 1382
4) 1382.5

4. If E and G respectively denote energy and gravitational constant, then E/G has the dimensions of: **(2021)**

1) $[M][L^{-1}][T^{-1}]$
2) $[M][L^0][T^0]$
3) $[M^2][L^{-2}][T^{-1}]$
4) $[M^2][L^{-1}][T^0]$

Answer Key

NCERT Topic-wise MCQs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
2	1	1	3	2	2	3	1	2	3	1	1	1	1	3	2	1
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
1	4	2	2	1	2	1	1	4	3	3	1	4	1	3	1	1
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
2	2	4	3	4	3	4	4	1	4	4	4	2	3	3	2	1
52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
1	3	1	4	2	4	3	3	3	3	4	2	4	2	4	2	4
69	70															
1	3															

Rank Booster MCQs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1	1	1	1	1	2	4	3	1	3	4	1	2	2	3	2
18	19	20	21	22	23											
3	4	4	3	3	3											

Statement Based MCQs

1	2	3	4	5
1	1	2	3	1

Assertion & Reason MCQs

1	2	3	4	5
4	3	2	3	3

Match the Column MCQs

1	2
2	4

NCERT Exemplar MCQs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2	3	3	4	1	3	1	4	1	1	3	4	2,4	1,2,4	1,2	2,4

Past 5 Years MCQs

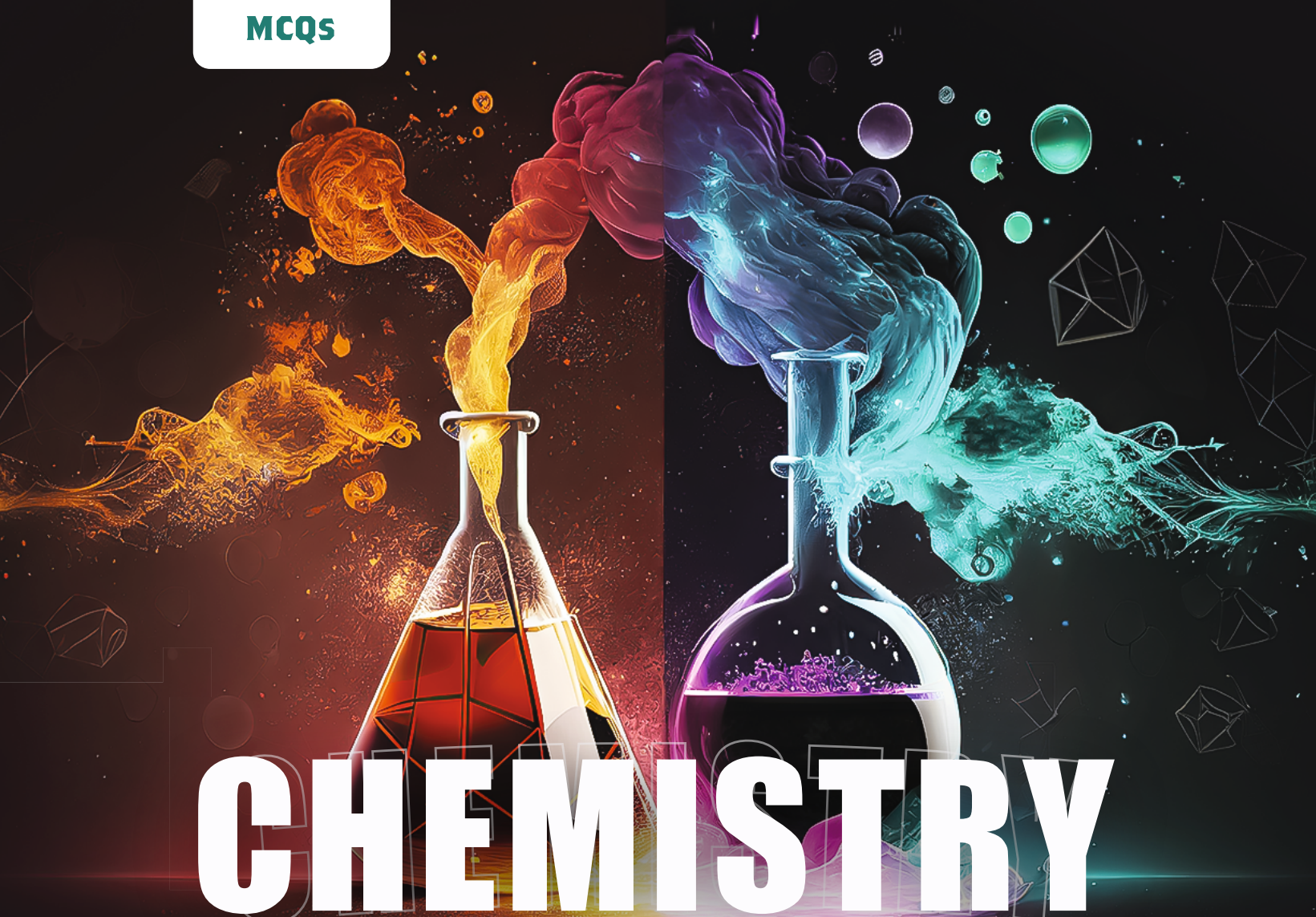
1	2	3	4	5	6	7	8	9	10	11	12	13
2	4	1	4	3	1	2	1	3	3	4	2	4

OBJECTIVE NCERT PUNCH

BOOK FOR COMPETITIVE EXAMS (NEET | JEE | CUET)

4500+ NTA LIKE MCQs

MCQs Extracted from NCERT Line by Line



CHEMISTRY

Highlighted Rationalised Content as per Latest NCERT

Pankaj Sijairya

About the Editor

Sir **Pankaj Sijairya,** from **jhansi**, is a renowned Chemistry Professor at PW with **14 yrs** of experience who received his **B.Tech** in Electronic Engineering from **HBTI Kanpur** where also he got excited about teaching chemistry to students, his way of teaching chemistry and grasp on the subject made the subject more accessible to masses. Till now he has taught more than **1.5 million** students studied and still Counting. Mentor of AIR 3, 6, 29 in JEE Advanced and 24, 28, 39, 42, 59, 67 in NEET and many more

He is recognized nationally for his teaching style and has great influence as a professor of chemistry. Pankaj Sijairya has also been invited for TEDxTALK for the difference he is making in the Education Field.

Pankaj Sir & Team together have curated the book which will help students to understand the concepts of chemistry easily and effectively. The book is designed for both **JEE and NEET** aspirants covering every topic. The book is consist of many tips and tricks as well for aspirants that they can use and save time in the examination.

Contributors

We extend our heartfelt gratitude to our team members: **Jyoti, Akanksha Awasthi, Jyoti Rakheja, Deepak Kumar, Sonu Pali** and **Bittoo**. Their invaluable contributions have enriched the very essence of our books.

Topper's Testimonials

Reading and understanding NCERT text books is a must do for NEET aspirants. Many students fail to realise the importance of NCERT. Once they realise, they find it challenging.To retain the information given in NCERT, one needs to practice a lot of questions. NCERT punch offers a variety of questions which helps in buliding grip on core concepts for NEET ,boards and JEE main

Samuel Harshith
NEET AIR-24

Contents

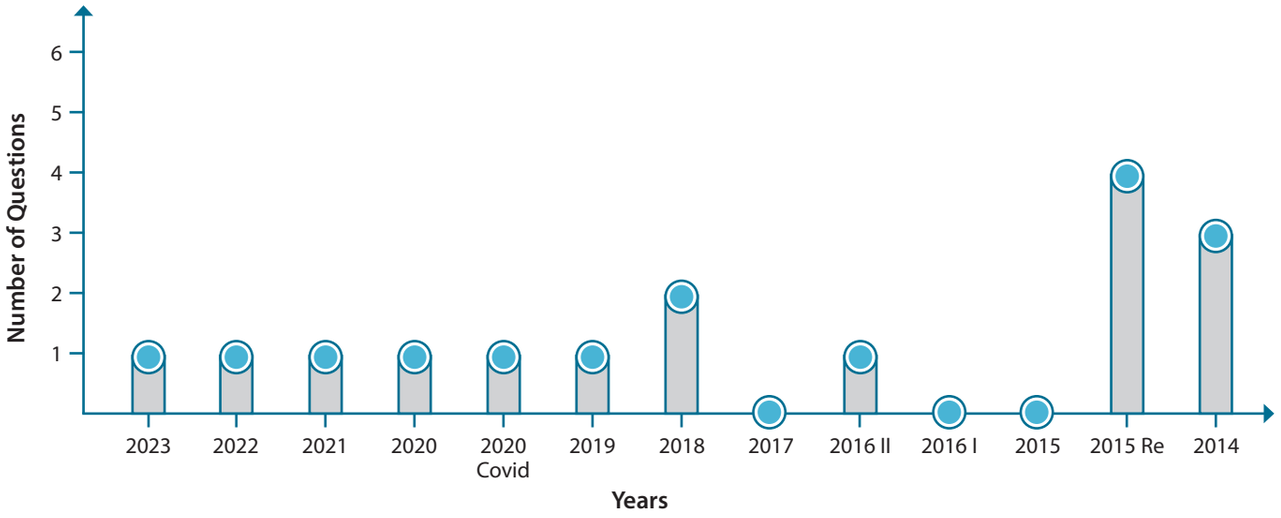
CLASS-XI

CLASS-XII

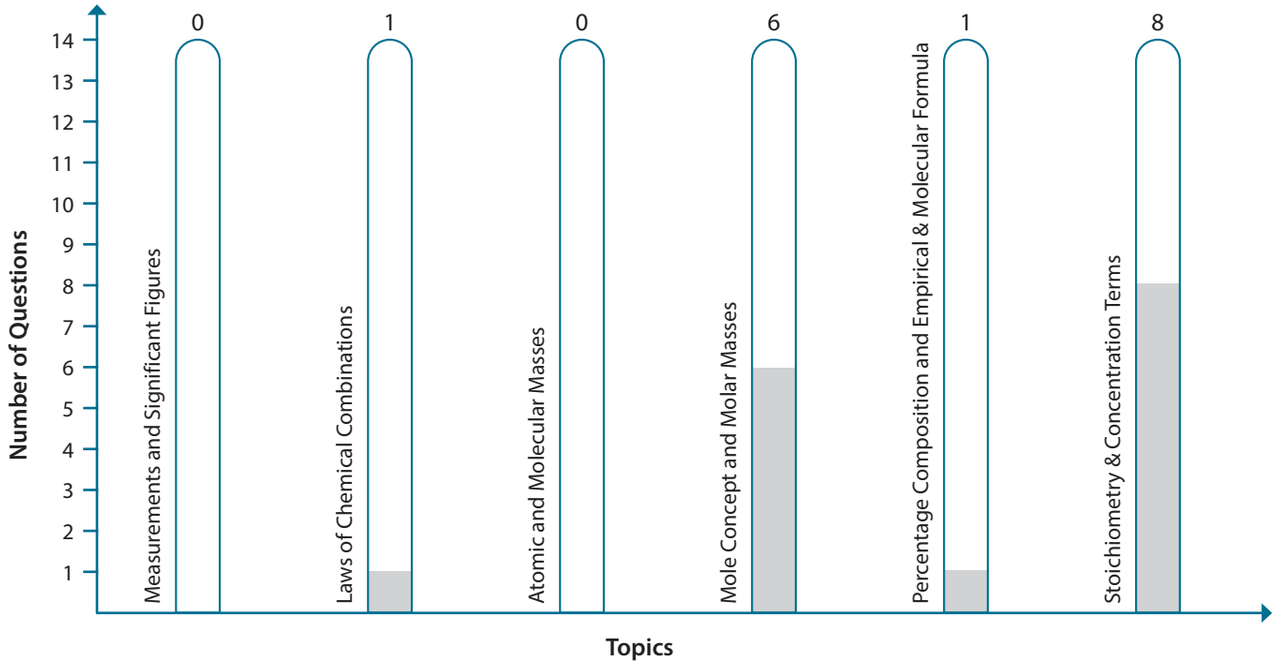
CHAPTER

1 Some Basic Concepts of Chemistry

Year Wise Number of Questions Analysis (2023-2014)



Topicwise Number of Questions Analysis (2023-2014)



General Introduction

Chemistry plays a central role in science and is often intertwined with other branches of science. Principles of chemistry are applicable in diverse areas, such as weather patterns, functioning of brain and operation of a computer, production in chemical industries etc. Chemistry provides methods for the isolation of lifesaving drugs from natural sources and makes possible synthesis of such drugs. Some of these drugs are cisplatin and taxol, which are effective in cancer therapy. The drug AZT (Azidothymidine) is used for helping AIDS patients. To be a good chemist and to accept new challanges, one needs to understand the basic concepts of chemistry, which begin with the concept of matter.

Matter & Its Classification

Anything which has mass and occupies space is called matter. Everything around us, for example: book, pen, pencil, water, air, all living beings, etc., is composed of matter.

States of Matter: Matter exist in three physical states viz. solid, liquid and gas. Because of different arrangement of particles, states of matter exhibit the following characteristics:

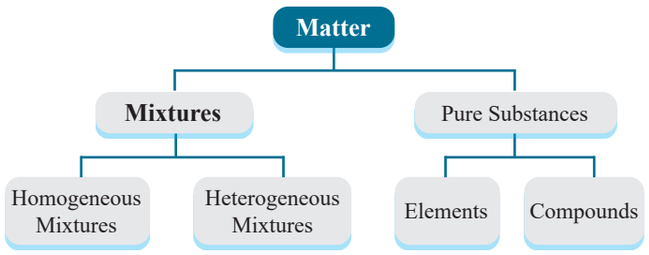
1. Solids have definite volume and definite shape.
2. Liquids have definite volume but do not have definite shape. They take the shape of the container in which they are placed.
3. Gases have neither definite volume nor definite shape. They completely occupy the space in the container in which they are placed.

These three states of matter are interconvertible by changing the conditions of temperature and pressure.

$$\text{Solid} \underset{\text{cool}}{\overset{\text{heat}}{\rightleftharpoons}} \text{liquid} \underset{\text{cool}}{\overset{\text{heat}}{\rightleftharpoons}} \text{Gas}$$

Usually a solid changes to a liquid, and the liquid on further heating changes to gas (or vapour). But when solid directly changes to the vapour state, the process is called **Sublimation**.

Classification of Matter: At the macroscopic level matter is classified as, mixture and pure substances. These are further classified as,



Classification of matter

In **a homogeneous mixture**, the components completely mix with each other. Sugar solution and air are the examples of homogeneous mixtures.

In contrast to this, **in a heterogeneous mixture**, the composition is not uniform throughout and sometimes different components are visible. For example, mixtures of salt and sugar, grains and pulses along with some dirt.

In **pure substances** constituent particles have fixed composition. Copper, silver, gold, water and glucose are some examples of pure substances. Pure substances can further be classified into **elements** and **compounds**. Particles of an **element** consist of **only one type of particles**. These particles may exist as **atoms or molecules**.

Sodium (Na), copper (Cu), silver (Ag), hydrogen (H), oxygen (O), etc. are some examples of elements. Whereas, Hydrogen (H_2), nitrogen (N_2) and oxygen (O_2) gases consist of molecules, in which two atoms combine to give their respective molecules.

When two or more atoms of different elements combine together in a definite ratio, the molecule of a **compound** is obtained. Examples of some compounds are water (H_2O), ammonia (NH_3), carbon dioxide (CO_2), sugar etc.

Measurement of Properties of Matter

The SI system has **seven** base units and they are listed in the given Table.

Base Physical Quantity	Symbol for Quantity	Name of SI Unit	Symbol for SI Unit
Length	l	metre	m
Mass	m	kilogram	kg
Time	t	second	s
Electric current	I	ampere	A
Thermodynamic temperature	T	kelvin	K
Amount of substance	n	mole	mol
Luminous intensity	I_v	candela	cd

The SI system allows the use of prefixes to indicate the multiples or submultiples of a unit. These prefixes are listed in following Table.

Multiple	Prefix	Symbol
10^{-15}	femto	f
10^{-12}	pico	p
10^{-9}	nano	n
10^{-6}	micro	m

MCQs

NCERT Topic-wise MCQs

Uncertainty in Measurement

1. The number of significant figures in value 5.041 is

1) 5 2) 2
3) 3 4) 4

2. Express the result of (0.582 + 324.65) to the appropriate number of significant figures:

1) 325.24 2) 325.23
3) 325.2 4) 325.232

3. Two students X and Y report the mass of the same substance as 7.0 g and 7.00 g respectively, which of the following statement is correct?

1) Both are equally accurate
2) X is more accurate than Y
3) Y is more accurate than X
4) Both are inaccurate scientifically

4. The number of significant figures in value of π are:

1) 1 2) 2
3) 3 4) ∞

5. The correctly reported answer of the addition of 29.4406, 3.2 and 2.25 will have significant figures:

1) 3 2) 4
3) 2 4) 5

6. The correctly reported answer of the area of rectangle which is 12.34 cm long and 1.23 cm wide is :

1) 15.2 m^2 2) 15.2 cm^2
3) 15.1 cm^2 4) 15.17 cm^2

7. If an object has a mass of 0.2876 g, then find the mass of nine such objects:

1) 2.5884 g 2) 2.5886 g
3) 2.588 g 4) 2.5 g

Laws of Chemical Combinations

8. *x* L of N_2 at S.T.P. contains 3×10^{22} molecules. The number of molecules in x/2 L of ozone at S.T.P. will be:

1) 3×10^{22} 2) 1.5×10^{22}
3) 1.5×10^{21} 4) 1.5×10^{11}

9. Which of the following data illustrates the law of conservation of mass?

1) 56 g of C reacts with 32 g of Oxygen to produce 44 g of CO_2
2) 1.70 g of $AgNO_3$ reacts with 100 mL of 0.1M HCl to produce 1.435 g of AgCl and 0.63 g of HNO_3
3) 12 g of C is heated in vacuum and on cooling, there is no change in mass
4) 36 g of S reacts with 16 g of O_2 to produce 48 g of SO_2

10. Two elements X and Y combine in gaseous state to form XY in the ratio 1:35.5 by mass. The mass of Y that will be required to react with 2 g of X is:

1) 7.1 g 2) 3.55 g
3) 71 g 4) 35.5 g

11. 4.4 g of an oxide of nitrogen gives 2.24 L of nitrogen and 60 g of another oxide of nitrogen gives 22.4 L of nitrogen at S.T.P. The data illustrates:

1) Law of conservation of mass
2) Law of constant proportions
3) Law of multiple proportions
4) Law of reciprocal proportions

12. If law of conservation of mass was to hold true, then 20.8 g of $BaCl_2$ on reaction with 9.8 g of H_2SO_4 will produce 7.3 g of HCl and $BaSO_4$ equal to:

1) 11.65 g 2) 23.3 g
3) 25.5 g 4) 30.6 g

13. The law of conservation of mass holds good for all of the following except.

1) All chemical reactions
2) Nuclear reaction
3) Endothermic reactions
4) Exothermic reactions

14. Hydrogen and oxygen combine to form H_2O_2 and H_2O containing 5.93% and 11.2% hydrogen respectively, the data illustrates:

1) Law of conservation of mass
2) Law of Constant proportions
3) Law of reciprocal proportions
4) Law of multiple proportions

Rank Booster MCQs

1. Light travels with a speed of 3×10^8 m/sec. The distance travelled by light in 1 Femto sec is:

1) 0.03 mm 2) 0.003 mm
3) 3 mm 4) 0.0003 mm

2. The molecular formula of a commercial resin used for exchanging ions in water softening is $C_8H_7SO_3^-Na^+$ (mol. wt 206). What would be the maximum uptake of Ca^{2+} ions by the resin when expressed in mole per gram resin?

1) $\frac{1}{103}$ 2) $\frac{1}{206}$
3) $\frac{2}{309}$ 4) $\frac{1}{412}$

3. If 10^{21} molecules are removed from 200 mg CO_2, then the number of moles of CO_2 left are:

1) 2.88×10^{-3} 2) 1.66×10^{-3}
3) 1.66×10^{-2} 4) 4.54×10^{-3}

4. If 1 ml of water contains 20 drops, then the number of molecules in a drop of water is:

1) 6×10^{23} 2) 1.376×10^{26}
3) 1.673×10^{21} 4) 4.34×10^{20}

5. If *x* g of A (atomic mass 50) contains n atoms, how many atoms are there in 20*x* g of elements B: (at wt. 100)

1) n 2) 10n
3) 20n 4) n/10

6. Diborane (B_2H_6) can be prepared by the following reaction-

$$3NaBH_4 + 4BF_3 \longrightarrow 3NaBF_4 + 2B_2H_6$$

If the reaction has a 70% yield, how many moles of $NaBH_4$ should be used with excess BF_3 in order to obtain 0.200 mol of B_2H_6?

1) 0.21 moles 2) 0.429 moles
3) 0.300 mol 4) 0.175 moles

7. An ore contains 1.24% of mineral argentate, Ag_2S by mass. How many grams of this ore would have to be processed in order to obtain 1g of pure solid silver?

1) 92.6 g 2) 88.1 g
3) 101.11 g 4) 107.25 g

8. An aqueous solution of ethanol has density 1.025 g/mL and molarity 8 M. Calculate molality of this solution:

1) 20.27 m 2) 17.12 m
3) 12.18 m 4) 1.117 m

9. The molar ratio of Cr^{2+} to Cr^{3+} in a mixture of $CrSO_4$ and $Cr_2(SO_4)_3$ having equal number of sulphate ions in both sulphates is

1) 1 : 3 2) 3 : 2
3) 2 : 3 4) 3 : 4

10. $A + 2B + 3C \rightleftharpoons AB_2C_3$

Reaction of 6 g of A, 6×10^{23} atoms of B & 0.036 mole of C yields 4.8 g of compound AB_2C_3. If the atomic masses of A & C are 60 & 80 amu respectively, the atomic mass of B is:

1) 60 amu 2) 50 amu
3) 90 amu 4) 120 amu

11. A 100 g of a sample of haemoglobin on analysis was found to contain 0.34% Fe by mass. If each haemoglobin molecule has four Fe^{2+} ions, the molecular mass of haemoglobin is- (Fe = 56 amu)

1) 77099.9 g 2) 12735 g
3) 65882 g 4) 96359.9 g

12. What volume of 5 M Na_2SO_4 must be added to 250 mL of 1 M $BaCl_2$ to produce 10 g of $BaSO_4$?

1) 8.58 mL 2) 6.4 mL
3) 18 mL 4) 22 mL

13. A compound is composed of O and Mn in equal weight ratio. Find the empirical formula of the compound.

1) Mn_3O_4 2) MnO_2
3) Mn_2O_3 4) Mn_2O_7

14. If isotopic distribution of C-12 and C-14 is 98% and 2% respectively, then the number of C-14 atoms in 12 g of carbon is:

1) 1.032×10^{22} 2) 3.01×10^{22}
3) 5.88×10^{23} 4) 6.02×10^{23}

15. Sulphuric acid reacts with sodium hydroxide as follows:

$H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$

When 1 L of 0.1 M sulphuric acid solution is allowed to react with 1 L of 0.1 M sodium hydroxide solution, the amount of sodium sulphate formed is:

1) 0.15 g 2) 7.10 g
3) 0.025 g 4) 3.55 g

16. X gm of Ag was dissolved in HNO_3 and the solution was treated with excess of NaCl. When 2.87 g of AgCl was precipitated, the value of x is

$Ag + 2HNO_3 \rightarrow AgNO_3 + NO_2 + H_2O$

$AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$

1) 1.08 g 2) 2.16 g
3) 2.70 g 4) 1.62 g

17. The % loss in weight after heating a pure sample of potassium chlorate (M. wt. 122.5) will be-

$$2KClO_3 \xrightarrow{\Delta} 2KCl + 3O_2$$

1) 12.25 2) 24.50
3) 39.18 4) 49.00

50. How many molecules of HCl gas will be produced by reacting 112 L of H_2 (0 °C, 1 atm) with 213 g of Cl_2?

1) 3.61×10^{24} 2) 6.13×10^{23}
3) 6.13×10^{24} 4) 1.63×10^{24}

51. 20 mL of 0.4 M $AgNO_3$ (molar mass = 170 g) is reacted with 15 mL of 0.6 M $BaCl_2$ (molar mass = 208.4 g). The mass of AgCl (molar mass = 143.5 g) produced is

1) 11.48 g 2) 18.14 g
3) 14.18 g 4) 1.148 g

52. 85 g $CaCO_3$ (limestone sample), on heating produces exactly the same amount of CO_2 which converts 30 g of MgO to $MgCO_3$. The percentage purity of limestone sample is

1) 80% 2) 82.4%
3) 88.24% 4) 84.8%

53. Mole fraction of acetic acid in an aqueous sample is 0.1. The molality of the solution is

1) 7.16 mol kg^{-1}
2) 1.67 mol kg^{-1}
3) 6.17 mol kg^{-1}
4) 5.25 mol kg^{-1}

54. Molarity of H_2SO_4 (density 1.8 g/mL) is 18 M. The molality of this H_2SO_4 is:

1) 36 2) 200
3) 500 4) 18

55. 1.5 moles of each of XY_2 and XY_3 if weigh 96 g and 120 g respectively. The atomic masses of X and Y respectively are

1) 4, 8 2) 8, 16
3) 32, 16 4) 32, 64

Match the Columns MCQs

1. Match the following:

Column-I		Column-II	
(a)	88 g of CO_2	(i)	0.25 mol
(b)	6.022×10^{23} molecules of H_2O	(ii)	2 mol
(c)	5.6 litres of O_2 at STP	(iii)	1 mol
(d)	96 g of O_2	(iv)	6.022×10^{23} molecules
(e)	1 mol of any gas	(v)	3 mol

1) (a)-(i) (b)-(iv) (c)-(iii) (d)-(ii) (e)-(v)
2) (a)-(ii) (b)-(iii) (c)-(i) (d)-(v) (e)-(iv)
3) (a)-(v) (b)-(ii) (c)-(iii) (d)-(iv) (e)-(i)
4) (a)-(iii) (b)-(v) (c)-(ii) (d)-(i) (e)-(iv)

2. Match the following physical quantities with units

Physical quantity		Unit	
(a)	Molarity	(i)	mol kg^{-1}
(b)	Molality	(ii)	mol L^{-1}
(c)	Mol fraction	(iii)	Unit less
(d)	Mole	(iv)	Mol

1) (a)-(i) (b)-(ii) (c)-(iii) (d)-(iv)
2) (a)-(ii) (b)-(i) (c)-(iv) (d)-(iii)
3) (a)-(i) (b)-(ii) (c)-(iv) (d)-(iii)
4) (a)-(ii) (b)-(i) (c)-(iii) (d)-(iv)

3. Match the following:

Column-I		Column-II	
(a)	Element	(i)	20 carat gold
(b)	Compound	(ii)	Iodized common salt
(c)	Homogeneous mixture	(iii)	Silica
(d)	Heterogeneous mixture	(iv)	Radium

1) (a)-(i) (b)-(ii) (c)-(iii) (d)-(iv)
2) (a)-(iv) (b)-(ii) (c)-(iii) (d)-(i)
3) (a)-(iv) (b)-(iii) (c)-(i) (d)-(ii)
4) (a)-(ii) (b)-(i) (c)-(iii) (d)-(iv)

4. Match the following

Column-I		Column-II	
(a)	mega	(i)	10^9
(b)	peta	(ii)	10^{-12}
(c)	pico	(iii)	10^{15}
(d)	giga	(iv)	10^6

1) (a)-(i) (b)-(iii) (c)-(ii) (d)-(iv)
2) (a)-(iv) (b)-(ii) (c)-(iii) (d)-(i)
3) (a)-(iv) (b)-(iii) (c)-(ii) (d)-(i)
4) (a)-(iii) (b)-(i) (c)-(ii) (d)-(iv)

5. Match the following

Column-I (Symbol)		Column-II (Unit)	
(a)	Newton	(i)	Kg m^2 sec^{-2}
(b)	Joule	(ii)	Kg m sec^{-2}
(c)	Acceleration	(iii)	m sec^{-2}
(d)	Mass	(iv)	kg

1) (a)-(i) (b)-(ii) (c)-(iii) (d)-(iv)
2) (a)-(iii) (b)-(i) (c)-(ii) (d)-(iv)
3) (a)-(ii) (b)-(i) (c)-(iii) (d)-(iv)
4) (a)-(ii) (b)-(iii) (c)-(i) (d)-(iv)

Correct & Incorrect MCQs

1. Identify the incorrect statement from the following

1) Glucose is not a pure substance.
2) Water, ammonia, sugar, CO_2 are compounds.
3) H_2 and O_2 are gases whereas the compound formed by their combination i.e., water is a liquid, used as fire extinguisher.
4) Sodium, copper, silver, hydrogen are elements.

2. Identify the incorrect statement from the following.

1) The multiple of prefix femto is 10^{-15}
2) The multiple of prefix pico is 10^{-12}
3) The multiple of prefix nano is 10^{-18}
4) The multiple of prefix micro is 10^{-6}

3. Which statement regarding mass and weight is not correct ?

1) Mass of a substance is the amount of matter present in it.
2) Weight is the force exerted by gravity on an object.
3) The SI unit of mass is kilogram.
4) Mass of a substance may vary from one place to another while weight of a substance is constant.

4. The incorrect statement regarding significant figures is:

1) There are three significant figures in 285 cm.
2) There are two significant figures in 0.25 mL.
3) There are three significant figures in 0.03
4) There are four significant figures in 2.005.

5. Select the incorrect statement regarding laws of chemical combination :

1) According to law of conservation of mass, matter can neither be created nor be destroyed
2) According to law of definite proportions, a given compound always contains exactly the same proportion of elements by weight.
3) According to law of multiple proportions, if two elements can combine to form more than one compound, the masses of one element that combine with a fixed mass of the other element, are in the ratio of small whole numbers.
4) According to Gay Lussac's law, equal volumes of all gases at the same temperature and pressure should contain equal number of molecules

6. Choose the correct statement:

1) Molecular mass of methane is 16.043 u.
2) Molecular mass of water is 24.0 u.
3) Molecular mass of glucose is 324.68 u.
4) Molecular mass of ammonia is 36.0 u.

7. Which statement regarding moles is not correct ?

1) The mole is the SI unit of amount of substance.
2) One mole of a substance contains exactly 12.044×10^{23} elementary entities.
3) 1 mol of hydrogen atoms contain 6.022×10^{23} atoms.
4) The mass of one mole of a substance in grams is called its molar mass.

8. Which amongst the following statements is not correct about the given reaction ?

$CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(g)$

1) One mole of $CH_4(g)$ reacts with two moles of $O_2(g)$ to give one mole of $CO_2(g)$ and two moles of $H_2O(g)$.
2) One molecule of $CH_4(g)$ reacts with 2 molecules of $O_2(g)$ to give one molecule of $CO_2(g)$ and 2 molecules of $H_2O(g)$.
3) 22.7 L of CH_4 (g) reacts with 45.4 L of O_2 (g) to give 22.7 L of CO_2 (g) and 45.4 L of $H_2O(g)$
4) 16 g of CH_4 (g) reacts with 32 g of O_2 (g) to give 44 g of CO_2 (g) and 18 g of H_2O (g).

9. Choose the incorrect statement about molarity :

1) Molarity is defined as the number of moles of the solute present in 1 litre of the solution.
2) Molarity is denoted by symbol M.
3) 1 M NaOH means 1 mol of NaOH present in 1 litre of the solution.
4) Molarity is independent on temperature.

10. Choose the correct statement/s :

A. 0.22 g of CO_2 contains 0.005 moles

B. 320 mg of SO_2 contains 0.005 moles

C. 560 mg of SO_2 contains 0.005 moles

D. 0.085 g of NH_3 contains 0.005 moles

1) A, B and C
2) Only C
3) A, B and D
4) B, C and D

Statement Based MCQs

Directions: These questions consist of two statements each, printed as Statement-I and Statement-II. While answering these questions, you are required to choose any one of the following four responses.

1) **Both Statement-I and Statement-II are correct.**
2) **Both Statement-I and Statement-II are incorrect.**
3) **Statement-I is correct & Statement-II is incorrect.**
4) **Statement-I is incorrect & Statement-II is correct.**

1. **Statement-I:** The mathematical approach to obtain the amount of the products or reactants is called stoichiometry.

   Statement-II: The stoichiometric calculations are derived from chemical equations.

2. **Statement-I:** A certain element X, forms three binary compounds with Chlorine containing 59.68%, 68.95% and 74.75% Chlorine respectively. These data illustrate the law of multiple proportions.

   Statement-II: According to law of multiple proportions, the relative amounts of an element combining with some fixed amount of a second element in a series of compounds are the ratios of small whole numbers.

3. **Statement-I:** 32 g of O_2 and 48 g of O_3 have same number of atoms.

   Statement-II: Number of moles in 32 g of O_2 and 48 g of O_3 are different.

4. **Statement-I:** Equal moles of different substances contain same number of constituent particles.

   Statement-II: Equal weights of different substances contain the same number of constituent particles.

5. **Statement-I:** Molality, mole fraction and mass fraction change with temperature.

   Statement-II: Molarity and Normality do not change with temperature.

6. **Statement-I:** Air is a homogeneous mixture.

   Statement II: The components of air completely mix with each other and its composition is uniform throughout.

7. **Statement-I:** Mass of a substance is constant where as its weight may vary from one place to another.

   Statement-II: Weight changes due to change in earth's gravity.

8. **Statement-I:** Matter can neither be created nor be destroyed.

   Statement-II: In all physical and chemical changes, the total mass of the reactants is never equal to the total mass of the products.

9. **Statement-I:** Molality of a solution depends upon temperature.

   Statement-II: Molarity of a solution depends upon temperature.

10. **Statement-I:** One mole is the amount of a substance that contains as many particles or entities as there are atoms in exactly 12 g of the 12C isotope.

    Statement-II: One mole of different substances contain different number of entities.

Assertion & Reason MCQs

Directions: These questions consist of two statements each, printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses.

1) **Both Assertion and Reason are True and the Reason is a correct explanation of the Assertion.**
2) **Both Assertion and Reason are True but Reason is not a correct explanation of the Assertion.**
3) **Assertion is True but the Reason is False.**
4) **Assertion is False but Reason is True.**

1. **Assertion:** 1 mole of any gas occupies 22.4 lit at NTP.

   Reason: Volume of gas depends on temperature, pressure and nature of gas.

2. **Assertion:** The no. of Oxygen atoms present in 16 g of oxygen and 16 g of O_3 is same.

   Reason: Both these species represents 1 g atom of oxygen.

3. **Assertion:** The number of significant figures in 1502 cm is two.

   Reason: All non-zero digits are significant and zeroes lie between any two non-zeroes will be significant.

4. **Assertion:** The ratio by volume of NH_3 : HCl : NH_4Cl is 1 : 1 : 1 in the reaction

   $NH_3(g) + HCl(g) \rightarrow NH_4Cl(s)$

   Reason: Gay Lussac's law deals with gaseous reactants and products only.

5. **Assertion:** 64 g of SO_2 and 80g of SO_3 will occupy same volume at NTP.

   Reason: 1 mole of any gas occupies 22.4 lit at NTP.

6. **Assertion:** The empirical mass of ethene is half of its molecular mass.

   Reason: The empirical formula represents the simplest whole number ratio of various atoms present in a compound.

7. **Assertion:** One atomic mass unit is defined as one twelfth of the mass of one carbon-12 atom.

   Reason: Carbon-12 isotope is the most abundant isotope of carbon and has been chosen as standard.

8. **Assertion:** Significant figures for 0.200 is 3 whereas for 200 it is 1.

   Reason: Zero at the end or right of a number are significant provided they are not on the right side of the decimal point.

9. **Assertion:** Combustion of 16 g of methane gives 18 g of water.

   Reason: In the combustion of methane, water is one of the products.

10. **Assertion:** 1 amu represents a mass equal to $1{\cdot}66 \times 10^{-27}$ kg.

    Reason: 1 amu represents the actual mass of one atom of carbon–12.

NCERT Exemplar MCQs

1. Two students performed the same experiment separately and each one of them recorded two readings of mass which are given below. Correct reading of mass is 3.0 g. On the basis of given data, mark the correct option out of the following statements:

Students	Readings	
	(i)	(ii)
A	3.01	2.99
B	3.05	2.95

   1) Results of both the students are neither accurate nor precise
   2) Results of student A are both precise and accurate
   3) Results of student B are neither precise nor accurate
   4) Results of student B are both precise and accurate

2. What will be the molarity of a solution, which contains 5.85 g of NaCl (s) per 500 mL?
   1) 4 mol L^{-1} 2) 20 mol L^{-1}
   3) 0.2 mol L^{-1} 4) 2 mol L^{-1}

3. If 500 mL of a 5 M solution is diluted to 1500 mL, what will be the molarity of the solution obtained?
   1) 1.5 M 2) 1.66 M
   3) 0.017 M 4) 1.59 M

4. The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following element contains the greatest number of atoms?
   1) 4 g He 2) 46 g Na
   3) 0.40 g Ca 4) 12 g He

5. If the concentration of glucose ($C_6H_{12}O_6$) in blood is 0.9 g L^{-1}, what will be the molarity of glucose in blood?
   1) 5 M 2) 50 M
   3) 0.005 M 4) 0.5 M

6. What will be the molality of the solution containing 18.25 g of HCl gas in 500 g of water?
   1) 0.1 m 2) 0.05 m
   3) 0.5 m 4) 1 m

7. One mole of any substance contains 6.022×10^{23} atoms/molecules. Number of molecules of H_2SO_4 present in 100 mL of 0.02 M H_2SO_4 solution is:
   1) 12.044×10^{20} molecules
   2) 6.022×10^{23} molecules
   3) 1×10^{23} molecules
   4) 12.044×10^{23} molecules

8. What is the mass per cent of carbon in carbon dioxide?
   1) 0.034% 2) 27.27%
   3) 3.4% 4) 28.7%

9. The empirical formula and molecular mass of a compound are CH_2O and 180 g respectively. What will be the molecular formula of the compound?
   1) $C_9H_{18}O_9$ 2) CH_2O
   3) $C_6H_{12}O_6$ 4) $C_2H_4O_2$

10. If the density of a solution is 3.12 g mL^{-1}, the mass of 1.5 mL solution in significant figures is:
    1) 4.7 g 2) 4680×10^{-3} g
    3) 4 .680 g 4) 46.80 g

11. Which of the following statements about a compound is incorrect?
    1) A molecule of a compound has atoms of different elements
    2) A compound cannot be separated into its constituent elements by physical methods of separation
    3) A compound retains the physical properties of its constituent elements
    4) The ratio of atoms of different elements in a compound is fixed

12. Which of the following statements is correct about the reaction given below?

$$4Fe(s) + 3O_2(g) \rightarrow 2Fe_2O_3(g)$$

    1) Total mass of iron and oxygen in reactants = total mass of iron and oxygen in product therefore it follows law of conservation of mass
    2) Total mass of reactants = total mass of product, therefore, law of multiple proportions is followed
    3) Amount of Fe_2O_3 can be increased by taking any one of the reactants (iron or oxygen) in excess
    4) Amount of Fe_2O_3 produced will decrease if the amount of any one of the reactants (iron or oxygen) is taken in excess

13. Which of the following statements indicates that law of multiple proportion is being followed?

1) Sample of carbon dioxide taken from any source will always have carbon and oxygen in the ratio 1 : 2
2) Carbon forms two oxides namely CO_2 and CO, where masses of oxygen which combine with fixed mass of carbon are in the simple ratio 2 :1
3) When magnesium burns in oxygen, the amount of magnesium taken for the reaction is equal to the amount of magnesium in magnesium oxide formed
4) At constant temperature and pressure, 200 mL of hydrogen will combine with 100 mL oxygen to produce 200 mL of water vapour

Past 5 Years MCQs

1. What mass of 95% pure $CaCO_3$ will be required to neutralise 50 mL of 0.5 M HCl solution according to the following reaction? **(2022)**

$CaCO_{3(s)} + 2HCl_{(aq)} \rightarrow CaCl_{2(aq)} + CO_{2(g)} + 2H_2O_{(l)}$

[Calculate upto second place of decimal point]

1) 9.50 g
2) 1.25 g
3) 1.32 g
4) 3.66 g

2. An organic compound contains 78% (by wt.) carbon and remaining percentage of hydrogen. The right option for the empirical formula of this compound is: [Atomic wt. of C is 12, H is 1] **(2021)**

1) CH_2 2) CH_3
3) CH_4 4) CH

3. Which one of the followings has maximum number of atoms? **(2020)**

1) 1 g of Mg(s) [Atomic mass of Mg = 24]
2) 1 g of O_2(g) [Atomic mass of O = 16]
3) 1 g of Li(s) [Atomic mass of Li = 7]
4) 1 g of Ag(s) [Atomic mass of Ag = 108]

4. One mole of carbon atom weighs 12g, the number of atoms in it is equal to. **(2020 Covid)**

(Mass of carbon- 12 is 1.9926×10^{-23} g)

1) 6.022×10^{22} 2) 12×10^{22}
3) 6.022×10^{23} 4) 12×10^{23}

5. The number of moles of hydrogen molecules required to produce 20 moles of ammonia through Haber's process is **(2019)**

1) 10 2) 20
3) 30 4) 40

6. A mixture of 2.3 g formic acid and 4.5 g oxalic acid is treated with concentration H_2SO_4. The evolved gaseous mixture is passed through KOH pellets. Weight (in g) of the remaining product at STP will be **(2018)**

1) 1.4 2) 3.0
3) 4.4 4) 2.8

7. In which case is number of molecules of water maximum? **(2018)**

1) 18 mL of water
2) 0.18 g of water
3) 10^{-3} mol of water
4) 0.00224 L of water vapours at 1 atm and 273 K

Answer Key

NCERT Topic-wise MCQs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
4	2	3	4	1	2	3	2	2	3	3	2	2	4	3	4	3
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
2	3	2	2	2	1	2	3	4	3	2	1	2	4	4	4	2
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
4	3	3	1	3	3	4	1	1	4	2	2	3	4	4	4	1
52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
2	1	1	2	4	3	4	4	1	1	4	3	1	4	1	3	1
69	70	71	72	73	74	75										
3	2	1	1	1	2	3										

Rank Booster MCQs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
4	4	1	3	2	2	1	3	2	2	3	1	4	1	2	2	3
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
2	1	2	4	2	2	1	1	3	1	1	4	2	3	2	3	2
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
2	1	3	2	3	2	3	4	1	2	4	1	4	4	4	1	4
52	53	54	55													
3	3	3	3													

Match the Columns MCQs

1	2	3	4	5
2	4	3	3	3

Correct & Incorrect MCQs

1	2	3	4	5	6	7	8	9	10
1	3	4	3	4	1	2	4	4	3

Statement Based MCQs

1	2	3	4	5	6	7	8	9	10
1	1	2	3	2	1	1	3	4	3

Assertion & Reason MCQs

1	2	3	4	5	6	7	8	9	10
3	1	4	4	1	1	2	2	4	3

NCERT Exemplar MCQs

1	2	3	4	5	6	7	8	9	10	11	12	13
2	3	2	4	3	4	1	2	3	1	3	1	2

Past 5 Years MCQs

1	2	3	4	5	6	7
3	2	3	3	3	4	1

Key Features of This Book

- 20% Short Notes for Quick Revision
- 100% NCERT Based Topic-wise MCQs
- 600+ A&R and Statement Type Questions
- 300+ Correct Incorrect Statement MCQs
- 150+ Match the Column MCQs
- NEET Past 5 Years Questions
- Highlighted Rationalised Content (RC) from Latest NCERT

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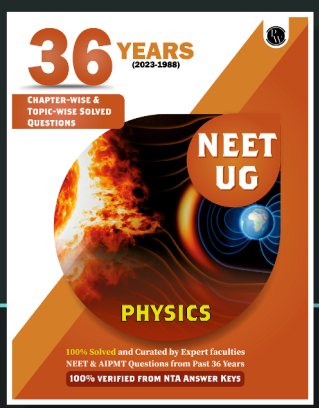

₹ 849/-

ISBN 978-81-19211-58-6

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