

CUET PG B.ed. Science 27th March 2024 Shift 2

Time Allowed :1 Hour 45 Minutes

Maximum Marks :300

Total Questions :75

General Instructions

Read the following instructions very carefully and strictly follow them:

1. This question paper comprises **75 questions**. **All questions are compulsory.**
2. Each question carries **04 (four) marks**.
3. For each correct response, the candidate will get **04 (four) marks**.
4. For each incorrect response, **01 (one) mark** will be deducted from the total score.
5. **Un-answered/un-attempted responses** will be given **no marks**.
6. To answer a question, the candidate needs to choose **one option as the correct option**.
7. However, after the process of **Challenges of the Answer Key**, in case there are multiple correct options or a change in the key, only those candidates who have attempted it correctly as per the **revised Final Answer Key** will be awarded marks.
8. In case a question is **dropped due to some technical error**, full marks shall be given to all the candidates irrespective of whether they have attempted it or not.

Question 1.

Lecithin is an example of which type of biomolecule?

Options:

- (1) Nucleotides
- (2) Phospholipids
- (3) Proteins
- (4) Polysaccharides

Correct Answer: (2) Phospholipids

Solution:

Lecithin is a phospholipid, which is a type of lipid containing a phosphate group and plays a key role in forming cell membranes.

Quick Tip

Phospholipids like lecithin are fundamental components of biological membranes.

Question 2.

Which of the following is NOT part of Forebrain?

Options:

- (1) Cerebrum
- (2) Hypothalamus
- (3) Cerebellum
- (4) Thalamus

Correct Answer: (3) Cerebellum

Solution:

The forebrain comprises the cerebrum, hypothalamus, and thalamus. The cerebellum is part of the hindbrain.

Quick Tip
Remember: Cerebellum is associated with the hindbrain, not the forebrain.

Question 3.

Match List-I with List-II:

List I (Cell/Tissue/Organs):

- (A) Mesorchium
- (B) Uriniferous tubules
- (C) Endocrine glands
- (D) Sinus venosus

List II (System):

- (I) Reproductive system
- (II) Vascular system
- (III) Chemical coordination
- (IV) Excretory system

Options:

- (1) (A)-(I), (B)-(IV), (C)-(III), (D)-(II)
- (2) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
- (3) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
- (4) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)

Correct Answer: (1) (A)-(I), (B)-(IV), (C)-(III), (D)-(II)

Solution:

Mesorchium is part of the reproductive system, uriniferous tubules belong to the excretory system, endocrine glands are associated with chemical coordination, and sinus venosus is part of the vascular system.

Quick Tip

Match organs and systems based on their functional associations.

Question 4.

Cranial meninges include:

- (A) Dura mater
- (B) Arachnoid
- (C) Neurotransmitters
- (D) Pia mater

Options:

- (1) (A), (B), and (D) only
- (2) (A) and (D) only
- (3) (A), (B), (C), and (D)
- (4) (A), (C), and (D) only

Correct Answer: (1) (A), (B), and (D) only

Solution:

Cranial meninges consist of three layers: dura mater, arachnoid, and pia mater. Neurotransmitters are not part of the meninges.

Quick Tip

Cranial meninges protect the brain with three distinct layers: dura mater, arachnoid, and pia mater.

Question 5.

Sequence of regions of the vertebral column, starting from the skull:

- (A) Thoracic
- (B) Cervical
- (C) Sacral
- (D) Lumbar

Options:

- (1) (A), (B), (C), (D)

- (2) (B), (A), (D), (C)
- (3) (B), (A), (C), (D)
- (4) (C), (B), (D), (A)

Correct Answer: (2) (B), (A), (D), (C)

Solution:

The vertebral column starts with the cervical region, followed by thoracic, lumbar, and sacral regions.

Quick Tip

Remember the vertebral sequence: Cervical → Thoracic → Lumbar → Sacral.

Question 6.

Colostrum is an example of:

Options:

- (1) Active immunity
- (2) Antigen
- (3) Passive immunity
- (4) Cancer

Correct Answer: (3) Passive immunity

Solution:

Colostrum provides antibodies to the newborn, offering passive immunity.

Quick Tip

Passive immunity involves the transfer of ready-made antibodies, such as those in colostrum.

Question 7.

What is the role of Sertoli cells in the reproductive system?

Options:

- (1) Synthesis of androgens
- (2) Secretion of androgens
- (3) To provide nutrition to germ cells
- (4) Release antibodies

Correct Answer: (3) To provide nutrition to germ cells

Solution:

Sertoli cells support and nourish the developing germ cells in the testes.

Quick Tip
Sertoli cells act as "nurse" cells for germ cells.

Question 8.

Match List-I with List-II:

List I (Structure):

- (A) Fimbriae
- (B) Seminiferous tubules
- (C) Acrosome
- (D) Graafian follicle

List II (Associated Organ):

- (I) Spermatozoa
- (II) Testes
- (III) Ovary
- (IV) Oviduct

Options:

- (1) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)
- (2) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
- (3) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)
- (4) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)

Correct Answer: (1) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)

Solution:

Fimbriae are associated with the oviduct, seminiferous tubules with testes, acrosome with spermatozoa, and Graafian follicle with the ovary.

Quick Tip
Structure-organ relationships are key in anatomy.

Question 9.

EST refers to:

Options:

- (1) Extra Sequence Tags
- (2) External Sequence Tags
- (3) Expressed Sequence Transcripts
- (4) Expressed Sequence Tags

Correct Answer: (4) Expressed Sequence Tags

Solution:

Expressed Sequence Tags (ESTs) are short sub-sequences of cDNA used to identify gene transcripts.

Quick Tip

ESTs are essential tools for gene identification.

Question 10.

The correct order of steps in the process of recombinant DNA technology:

- (A) Digestion by restriction enzyme
- (B) Transformation
- (C) Ligation
- (D) Isolation of DNA

Options:

- (1) (D), (C), (B), (A)
- (2) (A), (C), (B), (D)
- (3) (D), (A), (C), (B)
- (4) (A), (D), (C), (B)

Correct Answer: (3) (D), (A), (C), (B)

Solution:

The correct sequence involves isolating DNA, digesting it with restriction enzymes, ligating it to vectors, and then transformation.

Quick Tip

Memorize the sequence for recombinant DNA steps: Isolation → Digestion → Ligation → Transformation.

Question 11.

Large holes in "Swiss Cheese" are due to the production of large amounts of carbon dioxide

gas by the bacterium:

Options:

- (1) Lactobacillus bulgaricus
- (2) Propionibacterium sharmanii
- (3) Staphylococcus aureus
- (4) Bifidobacterium jejuni

Correct Answer: (2) Propionibacterium sharmanii

Solution:

The large holes in Swiss Cheese are created by CO₂ produced during fermentation by Propionibacterium sharmanii.

Quick Tip

Propionibacterium sharmanii is essential for Swiss Cheese production.

Question 12.

Identify which one is NOT a Sexually Transmitted Infection (STI):

Options:

- (1) Leishmaniasis
- (2) Syphilis
- (3) Chlamydiasis
- (4) Gonorrhoea

Correct Answer: (1) Leishmaniasis

Solution:

Leishmaniasis is caused by protozoa of the genus Leishmania and is transmitted by sandflies, not sexually.

Quick Tip

Leishmaniasis is vector-borne, not an STI.

Question 13.

Carolus Linnaeus is credited for:

Options:

- (1) Oxidative Phosphorylation

- (2) Binomial Nomenclature
- (3) Photoperiodism
- (4) Cryopreservation

Correct Answer: (2) Binomial Nomenclature

Solution:

Carolus Linnaeus developed the binomial nomenclature system for naming species with two names: genus and species.

Quick Tip

Binomial Nomenclature simplifies species identification and classification.

Question 14.

Which of the following are NOT examples of brown algae?

- (A) Laminaria
- (B) Ectocarpus
- (C) Volvox
- (D) Porphyra

Options:

- (1) (C) and (D) only
- (2) (A) only
- (3) (B), (C), and (D) only
- (4) (B) and (C) only

Correct Answer: (1) (C) and (D) only

Solution:

Volvox is a green alga, and Porphyra is a red alga. Laminaria and Ectocarpus are examples of brown algae.

Quick Tip

Classify algae based on pigmentation: brown (Phaeophyceae), red (Rhodophyceae), and green (Chlorophyceae).

Question 15.

Which of the following is an example of Sporozoan Protozoa?

Options:

- (1) Entamoeba

- (2) Trypanosoma
- (3) Paramecium
- (4) Plasmodium

Correct Answer: (4) Plasmodium

Solution:

Plasmodium, which causes malaria, belongs to the phylum Sporozoa (Apicomplexa), characterized by spore-forming stages.

Quick Tip

Plasmodium is a classic example of Sporozoan Protozoa.

Question 16.

Choose the correct order of taxonomical categories in descending order:

- (A) Genus
- (B) Order
- (C) Phylum
- (D) Class

Options:

- (1) (A), (C), (B), (D)
- (2) (C), (B), (D), (A)
- (3) (B), (D), (C), (A)
- (4) (C), (D), (B), (A)

Correct Answer: (4) (C), (D), (B), (A)

Solution:

The correct taxonomical hierarchy is Phylum → Class → Order → Genus.

Quick Tip

Taxonomical categories follow a descending order of inclusivity.

Question 17.

Identify the non-endospermous seeds:

- (A) Castor
- (B) Pea
- (C) Gram
- (D) Bean

Options:

- (1) (A), (B), and (D) only
- (2) (A), (B), and (C) only
- (3) (B), (C), and (D) only
- (4) (A), (B), (C), and (D)

Correct Answer: (3) (B), (C), and (D) only

Solution:

Pea, Gram, and Bean are dicots with non-endospermous seeds, while Castor has an endosperm.

Quick Tip

Non-endospermous seeds utilize stored food within cotyledons.

Question 18.

Conjoint, open vascular bundles are found in:

Options:

- (1) Monocot stem
- (2) Dicot stem
- (3) Monocot root
- (4) Dicot root

Correct Answer: (2) Dicot stem

Solution:

Dicot stems have conjoint, open vascular bundles allowing secondary growth.

Quick Tip

"Open vascular bundles" indicate the presence of cambium, allowing secondary growth.

Question 19.

In which type of chromosome, the centromere is located slightly away from the middle?

Options:

- (1) Metacentric chromosome
- (2) Sub-metacentric chromosome
- (3) Acrocentric chromosome
- (4) Telocentric chromosome

Correct Answer: (2) Sub-metacentric chromosome

Solution:

In sub-metacentric chromosomes, the centromere is slightly off-center, resulting in unequal arms.

Quick Tip

The position of the centromere determines chromosome types.

Question 20.

What is the percentage of Photosynthetically Active Radiation (PAR) captured by plants?

Options:

- (1) 100%
- (2) 70-80%
- (3) 40-50%
- (4) 2-10%

Correct Answer: (4) 2-10%

Solution:

Only 2-10% of PAR is used by plants for photosynthesis, as most light is reflected or absorbed otherwise.

Quick Tip

Plants capture only a small fraction of PAR for photosynthesis.

Question 21.

Which of the following is NOT a type of ex-situ conservation method?

Options:

- (1) Cryopreservation
- (2) Botanical gardens
- (3) In-vitro fertilization
- (4) National parks

Correct Answer: (4) National parks

Solution:

National parks are in-situ conservation methods as they conserve biodiversity within its natural

habitat. Ex-situ methods involve conservation outside natural habitats.

Quick Tip

Ex-situ conservation includes methods like gene banks, seed banks, and zoos.

Question 22.

The World Summit on Sustainable Development held in 2002 was organized at:

Options:

- (1) Rio de Janeiro
- (2) Johannesburg
- (3) Montreal
- (4) Los Angeles

Correct Answer: (2) Johannesburg

Solution:

The 2002 World Summit on Sustainable Development was held in Johannesburg, South Africa, focusing on sustainable development initiatives.

Quick Tip

Johannesburg Summit emphasized the implementation of Agenda 21.

Question 23.

Match List-I with List-II:

List-I: (Plant growth regulator)

- (A) Auxins
- (B) Gibberellins
- (C) Cytokinins
- (D) Absciscic acid

List-II: (Function)

- (I) Stress hormone
- (II) Parthenocarpy in tomatoes
- (III) Bolting in a rosette plant
- (IV) Delay leaf senescence

Options:

- (1) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
- (2) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)

(3) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)

(4) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)

Correct Answer: (1) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)

Solution:

Auxins promote parthenocarpy, gibberellins cause bolting, cytokinins delay senescence, and abscisic acid functions as a stress hormone.

Quick Tip

Plant growth regulators have distinct physiological roles in plant development.

Question 24.

The path of transfer of electrons involves the following order in Z scheme:

(A) PS-I

(B) PS-II

(C) ETS

(D) NADP

Options:

(1) (A), (B), (C), (D)

(2) (A), (C), (B), (D)

(3) (B), (C), (A), (D)

(4) (B), (A), (D), (C)

Correct Answer: (3) (B), (C), (A), (D)

Solution:

The Z-scheme involves electron transfer from PS-II to ETS, then to PS-I, and finally to NADP to form NADPH.

Quick Tip

The Z-scheme describes light-dependent reactions of photosynthesis.

Question 25.

Henri Becquerel discovered this phenomenon:

Options:

(1) Radioactivity

(2) Fluorescence

- (3) Photoelectric effect
- (4) Spectroscopy

Correct Answer: (1) Radioactivity

Solution:

Henri Becquerel discovered radioactivity in 1896 while working with phosphorescent materials.

Quick Tip

Radioactivity is the spontaneous emission of particles or radiation from unstable nuclei.

Question 26.

Arrange the following according to their increasing size:

- (A) Mg
- (B) Al
- (C) Mg^{2+}
- (D) Al^{3+}

Options:

- (1) (D), (B), (C), (A)
- (2) (A), (C), (B), (D)
- (3) (D), (B), (A), (C)
- (4) (D), (C), (B), (A)

Correct Answer: (4) (D), (C), (B), (A)

Solution:

Ionic size decreases with increasing positive charge due to greater nuclear pull on electrons.

Quick Tip

Cations are smaller than their neutral atoms.

Question 27.

VSEPR theory stands for:

Options:

- (1) Vacant Shell Electron Pair Repulsion Theory
- (2) Valence Shell Electron Pair Retention Theory
- (3) Valence Shell Electron Pair Repulsion Theory

(4) Vacant Shell Electron Pair Resonance Theory

Correct Answer: (3) Valence Shell Electron Pair Repulsion Theory

Solution:

VSEPR theory explains molecular geometry based on electron pair repulsion in the valence shell.

Quick Tip

The VSEPR model predicts the 3D shape of molecules.

Question 28.

Select the disaccharide molecule from the following:

Options:

- (1) Ribose
- (2) Fructose
- (3) Lactose
- (4) Galactose

Correct Answer: (3) Lactose

Solution:

Lactose is a disaccharide composed of glucose and galactose. Ribose, fructose, and galactose are monosaccharides.

Quick Tip

Disaccharides consist of two monosaccharides joined by a glycosidic bond.

Question 29.

The element that does not belong to actinoids is:

- (A) Mg
- (B) Th
- (C) U
- (D) Ba

Options:

- (1) (A), (B), and (D) only
- (2) (A), (C), and (D) only
- (3) (A) and (D) only

(4) (B) and (C) only

Correct Answer: (3) (A) and (D) only

Solution:

Mg and Ba are not part of the actinoid series, which includes elements from Th to Lr.

Quick Tip
Actinoids are f-block elements with atomic numbers 89 to 103.

Question 30.

Match List-I with List-II:

List-I:

- (A) Halogens
- (B) Noble gases
- (C) Chalcogens
- (D) Lanthanoids

List-II:

- (I) Ne
- (II) Ce
- (III) S
- (IV) Br

Options:

- (1) (A)-(IV), (B)-(I), (C)-(III), (D)-(II)
- (2) (A)-(IV), (B)-(I), (C)-(II), (D)-(III)
- (3) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)
- (4) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)

Correct Answer: (1) (A)-(IV), (B)-(I), (C)-(III), (D)-(II)

Solution:

Halogens include Br, noble gases include Ne, chalcogens include S, and lanthanoids include Ce.

Quick Tip
The periodic table classifies elements based on their properties.

Question 31.

Which of the following is an intensive property?

Options:

- (1) Volume
- (2) Mass
- (3) Enthalpy
- (4) Molar volume

Correct Answer: (4) Molar volume

Solution:

An intensive property is independent of the amount of matter. Molar volume, being a ratio of volume to amount, is an intensive property, unlike volume, mass, or enthalpy.

Quick Tip

Examples of intensive properties include temperature, density, and molar properties.

Question 32.

What is the oxidation number of O in OF_2 ?

Options:

- (1) +1
- (2) +2
- (3) +3
- (4) -1

Correct Answer: (1) +1

Solution:

In OF_2 , fluorine is more electronegative than oxygen and has an oxidation state of -1. Since the compound is neutral, oxygen has an oxidation number of +2 to balance the two fluorine atoms.

Quick Tip

Fluorine always has an oxidation state of -1 in its compounds.

Question 33.

Protium, Deuterium, and Tritium are:

Options:

- (1) Isobars

- (2) Isotopes
- (3) Isomers
- (4) Enantiomers

Correct Answer: (2) Isotopes

Solution:

Protium, Deuterium, and Tritium are isotopes of hydrogen, differing in the number of neutrons but having the same atomic number.

Quick Tip

Isotopes have identical chemical properties but may differ in physical properties.

Question 34.

Match List-I with List-II:

List-I:

- (A) Solvay process
- (B) Kjeldahl's method
- (C) Castner-Kellner process
- (D) Carius method

List-II:

- (I) Halogens
- (II) Nitrogen
- (III) Sodium carbonate
- (IV) Sodium hydroxide

Options:

- (1) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
- (2) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)
- (3) (A)-(III), (B)-(II), (C)-(I), (D)-(IV)
- (4) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)

Correct Answer: (3) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)

Solution:

The Solvay process produces sodium carbonate, Kjeldahl's method estimates nitrogen, the Castner-Kellner process makes sodium hydroxide, and the Carius method analyzes halogens.

Quick Tip

Each chemical process has a specific industrial application.

Question 35.

Caustic soda is:

Options:

- (1) Sodium carbonate
- (2) Sodium hydroxide
- (3) Sodium chloride
- (4) Sodium hydrogencarbonate

Correct Answer: (2) Sodium hydroxide

Solution:

Caustic soda is the common name for sodium hydroxide (NaOH).

Quick Tip
NaOH is widely used in soap production and chemical manufacturing.

Question 36.

Arrange the following as per the increase in atomic number:

- (A) Carbon
- (B) Tin
- (C) Lead
- (D) Silicon

Options:

- (1) (A), (B), (C), (D)
- (2) (A), (D), (C), (B)
- (3) (A), (D), (B), (C)
- (4) (C), (B), (A), (D)

Correct Answer: (3) (A), (D), (B), (C)

Solution:

Atomic numbers increase in the sequence: Carbon (6), Silicon (14), Tin (50), Lead (82).

Quick Tip
Elements in a group show periodic trends based on atomic number.

Question 37.

Match List-I with List-II:

List-I:

- (A) Ranitidine
- (B) Norethindrone
- (C) Aspirin
- (D) Ofloxacin

List-II:

- (I) Antacid
- (II) Analgesic
- (III) Antibiotic
- (IV) Antifertility

Options:

- (1) (A)-(I), (B)-(IV), (C)-(II), (D)-(III)
- (2) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)
- (3) (A)-(I), (B)-(IV), (C)-(II), (D)-(III)
- (4) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)

Correct Answer: (3) (A)-(I), (B)-(IV), (C)-(II), (D)-(III)

Solution:

Ranitidine is an antacid, Norethindrone is an antifertility drug, Aspirin is an analgesic, and Ofloxacin is an antibiotic.

Quick Tip
Pharmaceutical classifications help identify drug functionalities.

Question 38.

HTTP stands for:

Options:

- (1) High Text Transfer Problem
- (2) Hyper Technology Transfer Process
- (3) Hyper Text Transfer Protocol
- (4) Hyper Technology Transfer Protocol

Correct Answer: (3) Hyper Text Transfer Protocol

Solution:

HTTP is the foundation of data communication on the web, enabling the transfer of hypertext.

Quick Tip

HTTP is integral to web browsers and servers.

Question 39.

Which of the following statement(s) is/are TRUE for a database?

- (A) Database is a collection of logically related data.
- (B) DBMS is a specialized software that is responsible for the creation, maintenance, and use of a database.
- (C) RDBMS stores the data centrally in the form of a collection of tables known as relations.
- (D) SQL is a database that stores the data in tabular form.

Options:

- (1) (A), (B), and (D) only
- (2) (A), (B), and (C) only
- (3) (A), (B), (C), and (D)
- (4) (B), (C), and (D) only

Correct Answer: (2) (A), (B), and (C) only

Solution:

SQL is not a database but a language to query databases. Statements (A), (B), and (C) are true.

Quick Tip

Understanding database concepts aids in efficient data management.

Question 40.

Which of the following is an example of Application Software?

Options:

- (1) Android
- (2) Unix
- (3) Disk Defragmenter
- (4) MS-Office

Correct Answer: (4) MS-Office

Solution:

MS-Office is application software used for document creation, data processing, and presentation.

Quick Tip

Application software is designed for end-user tasks.

Question 41.

In MS-Word, Portrait and Landscape are:

Options:

- (1) Page Orientation
- (2) Page Scale
- (3) Paper Size
- (4) Page Margin

Correct Answer: (1) Page Orientation

Solution:

Portrait and Landscape refer to the page layout in terms of orientation, determining the direction in which the content is displayed.

Quick Tip

Orientation settings can be found in the Page Layout tab in MS-Word.

Question 42.

C Programming language was developed by:

Options:

- (1) Marcian "Ted" Hoff
- (2) Douglas Engelbart
- (3) Dennis Ritchie
- (4) Charles Babbage

Correct Answer: (3) Dennis Ritchie

Solution:

Dennis Ritchie developed the C programming language at Bell Labs in 1972.

Quick Tip

C is a foundational language influencing many modern programming languages.

Question 43.

_____ are words that a programming language has set aside for its own use and have a special meaning.

Options:

- (1) Control words
- (2) Saved words
- (3) Important words
- (4) Reserved words

Correct Answer: (4) Reserved words

Solution:

Reserved words are predefined in programming languages, and their use is restricted for specific operations. Examples include 'if', 'else', 'while'.

Quick Tip

Always avoid using reserved words as variable names in your code.

Question 44.

Match List-I with List-II:

List-I:

- (A) FTP
- (B) Hub
- (C) QWERTY
- (D) Trojan

List-II:

- (I) Malware
- (II) Network Protocol
- (III) Networking Device
- (IV) Keyboard Layout

Options:

- (1) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
- (2) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
- (3) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
- (4) (A)-(III), (B)-(II), (C)-(I), (D)-(IV)

Correct Answer: (1) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)

Solution:

FTP (File Transfer Protocol) is a network protocol, Hub is a networking device, QWERTY

refers to the keyboard layout, and Trojan is a type of malware.

Quick Tip

Understanding the classification of terms helps in system management and troubleshooting.

Question 45.

Which one of the following is NOT a type of hacker?

Options:

- (1) Black Hat hackers
- (2) Orange Hat hackers
- (3) Grey Hat hackers
- (4) White Hat hackers

Correct Answer: (2) Orange Hat hackers

Solution:

Black Hat, Grey Hat, and White Hat hackers are real categories, while Orange Hat is fictional.

Quick Tip

Hackers are categorized based on their intent and actions.

Question 46.

Which of the following is NOT a malware?

Options:

- (1) Virus
- (2) Spyware
- (3) Worm
- (4) Cookies

Correct Answer: (4) Cookies

Solution:

Cookies are used for storing user data in web browsers and are not malicious, unlike malware like viruses, spyware, or worms.

Quick Tip

Regularly clearing cookies can enhance privacy but does not address malware threats.

Question 47.

Arrange the following binary numbers in increasing order:

- (A) 0111
- (B) 1110
- (C) 1010
- (D) 0010

Options:

- (1) $D < A < C < B$
- (2) $A < D < C < B$
- (3) $D < A < B < C$
- (4) $D < B < A < C$

Correct Answer: (3) $D < A < C < B$

Solution:

Converting binary to decimal:

$D (0010) = 2$, $A (0111) = 7$, $C (1010) = 10$, $B (1110) = 14$.

Order: $D < A < C < B$.

Quick Tip

Binary to decimal conversion is crucial in computer systems for number representation.

Question 48.

Bandwidth is measured in:

Options:

- (1) Hertz
- (2) Bits
- (3) Kbps
- (4) Metre

Correct Answer: (1) Hertz

Solution:

Bandwidth is the range of frequencies within a given band, particularly in the context of transmitting a signal. It is measured in Hertz (Hz).

Quick Tip

For digital communication, bandwidth is often expressed in bits per second, but the correct scientific unit is Hertz.

Question 49.

Which of the following keys is used to establish a relationship between tables in a relational database?

Options:

- (1) Primary Key
- (2) Foreign Key
- (3) Candidate Key
- (4) Alternate Key

Correct Answer: (2) Foreign Key

Solution:

A Foreign Key is a field (or collection of fields) in one table that uniquely identifies a row of another table. It is used to establish a relationship between the two tables.

Quick Tip

Foreign keys are essential for maintaining data integrity in relational databases.

Question 50.

The particle nature of light can be explained by the:

Options:

- (1) Doppler Effect
- (2) Photoelectric Effect
- (3) Young's Double Slit Experiment
- (4) Piezo Effect

Correct Answer: (2) Photoelectric Effect

Solution:

The Photoelectric Effect demonstrates the particle nature of light, as photons transfer energy to electrons, causing their emission.

Quick Tip

Albert Einstein's explanation of the Photoelectric Effect provided key evidence for quantum theory.

Question 51.

Match List-I with List-II:

List-I:

- (A) Intrinsic Semiconductor
- (B) n-type Semiconductor
- (C) p-type Semiconductor
- (D) Compound Inorganic Semiconductor

List-II:

- (I) CdS
- (II) Si doped with B
- (III) Si doped with As
- (IV) Si

Options:

- (1) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
- (2) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)
- (3) (A)-(I), (B)-(III), (C)-(IV), (D)-(II)
- (4) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)

Correct Answer: (1) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)

Solution:

Intrinsic semiconductors are pure materials like silicon (Si). Doping Si with As creates an n-type, while doping with B creates a p-type semiconductor. CdS is a compound inorganic semiconductor.

Quick Tip

Doping alters the conductivity of semiconductors, making them useful in electronics.

Question 52.

Two capacitors C_1 and C_2 are connected in parallel. If charge Q is given to the assembly, then the ratio of charge on C_1 to charge on C_2 will be:

Options:

- (1) C_2/C_1
- (2) C_1/C_2

- (3) 1
(4) $C_1 C_2$

Correct Answer: (2) C_1/C_2

Solution:

In parallel connection, the charge on each capacitor is proportional to its capacitance, so the ratio is $Q_1/Q_2 = C_1/C_2$.

Quick Tip

Capacitors in parallel share the same voltage across them.

Question 53.

Out of the following, select the molecules having zero dipole moment:

- (A) CH_4
(B) CO_2
(C) H_2O
(D) $NaCl$

Options:

- (1) (A), (B), and (D) only
(2) (A) and (C) only
(3) (A) and (D) only
(4) (A) and (B) only

Correct Answer: (4) (A) and (B) only

Solution:

CH_4 and CO_2 are symmetric molecules with zero dipole moments. H_2O and $NaCl$ are polar molecules with non-zero dipole moments.

Quick Tip

Molecular geometry determines whether dipole moments cancel out.

Question 54.

Identify the materials which exhibit weak dependence of resistivity with temperature:

- (A) Copper
(B) Nichrome
(C) Constantan
(D) Manganin

Options:

- (1) (A), (B), and (D) only
- (2) (A), (B), and (C) only
- (3) (A), (B), (C), and (D)
- (4) (B), (C), and (D) only

Correct Answer: (4) (B), (C), and (D) only

Solution:

Nichrome, Constantan, and Manganin exhibit weak temperature dependence, making them suitable for resistors. Copper strongly depends on temperature.

Quick Tip

Alloys are preferred in precision resistors due to their stable resistivity.

Question 55.

Which of the following statements are related to the limitations of Bohr's model?

- (A) It is applicable to two-electron atoms such as helium.
- (B) It is applicable to hydrogenic atoms.
- (C) It is able to account for the intensity variations.
- (D) It is unable to account for the intensity variations.

Options:

- (1) (A) and (B) only
- (2) (C) and (B) only
- (3) (B) and (D) only
- (4) (A) and (D) only

Correct Answer: (3) (B) and (D) only

Solution:

Bohr's model is applicable only to hydrogen-like atoms and fails to explain intensity variations in spectral lines.

Quick Tip

The Bohr model was foundational but replaced by quantum mechanics for multi-electron systems.

Question 56.

The magnetic susceptibility of a paramagnetic material is:

Options:

- (1) Small and positive
- (2) Small and negative
- (3) Large and negative
- (4) Large and positive

Correct Answer: (1) Small and positive

Solution:

Paramagnetic materials have unpaired electrons and are weakly attracted to a magnetic field, leading to a small positive magnetic susceptibility.

Quick Tip

Paramagnetic materials have a positive susceptibility and align weakly with external magnetic fields.

Question 57.

Match List-I with List-II:

List-I: Physical Quantity

- (A) Electric Flux
- (B) Magnetic Moment
- (C) Magnetic Field
- (D) Magnetic Flux

List-II: Units

- (I) Tesla
- (II) Volt Meter
- (III) Weber
- (IV) Ampere Meter

Options:

- (1) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)
- (2) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)
- (3) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)
- (4) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)

Correct Answer: (4) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)

Solution:

- Electric Flux is measured in Volt Meters.
- Magnetic Moment is measured in Weber.
- Magnetic Field is measured in Tesla.

- Magnetic Flux is measured in Ampere Meter.

Quick Tip

Matching physical quantities with their correct units is crucial for solving physics problems effectively.

Question 58.

The mass defect in a nuclear fusion reaction is 0.1%. What amount of energy is liberated in 1 kg fusion reaction?

Options:

- (1) 9×10^{16} Joule
- (2) 9×10^{15} Joule
- (3) 9×10^{13} Joule
- (4) 9×10^{12} Joule

Correct Answer: (3) 9×10^{13} Joule

Solution:

Using Einstein's equation $E = \Delta mc^2$, with a mass defect of 0.1% for 1 kg and $c = 3 \times 10^8$ m/s, the energy released is 9×10^{13} J.

Quick Tip

Fusion reactions produce enormous energy due to the small mass defect being converted into energy.

Question 59.

Lenz's law is associated with:

Options:

- (1) Conservation of mass
- (2) Conservation of energy
- (3) Conservation of current
- (4) Conservation of motion

Correct Answer: (2) Conservation of energy

Solution:

Lenz's law ensures that the direction of induced current opposes the change in magnetic flux, thereby conserving energy in the system.

Quick Tip

Lenz's law highlights the importance of energy conservation in electromagnetic induction.

Question 60.

Arrange the following electromagnetic waves in the order of increasing wavelength:

- (A) Gamma rays
- (B) Radio waves
- (C) Microwaves
- (D) Ultraviolet rays

Options:

- (1) (B), (D), (C), (A)
- (2) (A), (B), (D), (C)
- (3) (A), (D), (C), (B)
- (4) (B), (C), (D), (A)

Correct Answer: (3) (A), (D), (C), (B)

Solution:

Gamma rays have the shortest wavelength, followed by ultraviolet rays, microwaves, and then radio waves with the longest wavelength.

Quick Tip

Understanding electromagnetic wave properties is crucial for applications in communication and healthcare.

Question 66.

Which of the following is a communicable disease?

Options:

- (1) Hypertension
- (2) Hepatitis
- (3) Diabetes
- (4) Cancer

Correct Answer: (2) Hepatitis

Solution:

Hepatitis is a communicable disease caused by viruses. It spreads through contaminated food,

water, or direct contact with an infected person.

Quick Tip

Hepatitis can be prevented through vaccination and maintaining hygiene.

Question 67.

The term "hidden hunger" is associated with:

Options:

- (1) Protein deficiency
- (2) Micronutrient deficiency
- (3) Fat insufficiency
- (4) Lack of energy

Correct Answer: (2) Micronutrient deficiency

Solution:

"Hidden hunger" refers to the chronic lack of vitamins and minerals (micronutrients) in the diet. It is prevalent in populations with limited access to diverse and nutritious food.

Quick Tip

Address hidden hunger by incorporating fortified foods and diverse diets.

Question 68.

Identify the duties of a front office manager.

- (A) Responsible for managing the front office, lobby, and transport activities.
- (B) Organizes, supervises, and controls all uniformed services.
- (C) Provides information and communicates with in-house guests and visitors.
- (D) Schedules shifts/staff rotations and duties of the staff in shifts.

Options:

- (1) (A) and (D) only
- (2) (A), (B), and (D) only
- (3) (A), (B), (C), and (D)
- (4) (A) and (B) only

Correct Answer: (1) (A) and (D) only

Solution:

The front office manager focuses on managing front office activities and staff scheduling. Other

tasks may fall under additional roles like guest relations or lobby managers.

Quick Tip

Clear role definition enhances operational efficiency in hospitality management.

Question 69.

HACCP stands for which among the following?

Options:

- (1) Hazard Analysis Critical Control Points
- (2) Highly Analytical Critical Control Process
- (3) Hazardous Activity Check Control Parameters
- (4) Hazard Analysis Check Control Process

Correct Answer: (1) Hazard Analysis Critical Control Points

Solution:

HACCP is a systematic approach to food safety that identifies, evaluates, and controls hazards throughout the production process.

Quick Tip

HACCP is vital for ensuring food safety in production and processing industries.

Question 70.

Arrange the steps of the media planning process in the correct sequence:

- (A) Deciding and developing media strategies.
- (B) Developing a media schedule for plan of action for execution.
- (C) Identifying group media targets.
- (D) Deciding and defining media objectives.

Options:

- (1) (D), (A), (C), (B)
- (2) (C), (D), (A), (B)
- (3) (B), (A), (D), (C)
- (4) (C), (B), (D), (A)

Correct Answer: (2) (C), (D), (A), (B)

Solution:

Media planning begins with identifying targets, followed by defining objectives, deciding

strategies, and finally developing execution plans.

Quick Tip

Effective media planning requires a clear strategy and measurable objectives.

Question 71.

Arrange the organizational chart of a housekeeping department below the level of Executive Housekeeper:

- (A) Housemen.
- (B) Room Attendant.
- (C) Floor Supervisor.
- (D) Assistant Housekeeper.

Options:

- (1) (C), (A), (D), (B)
- (2) (A), (B), (D), (C)
- (3) (D), (A), (C), (B)
- (4) (D), (C), (B), (A)

Correct Answer: (4) (D), (C), (B), (A)

Solution:

The hierarchy begins with the Assistant Housekeeper, followed by Floor Supervisors, Room Attendants, and Housemen at the base.

Quick Tip

An organized structure ensures efficient housekeeping operations.

Question 72.

Identify the units/terms associated with fabric inspection and testing:

- (A) Thread Count.
- (B) Parts per Million.
- (C) Gram per Square Meter.
- (D) Picks per Inch.

Options:

- (1) (A), (C), and (D) only
- (2) (A), (B), and (D) only
- (3) (A), (B), (C), and (D)
- (4) (B), (C), and (D) only

Correct Answer: (1) (A), (C), and (D) only

Solution:

Thread Count, Gram per Square Meter, and Picks per Inch are directly associated with fabric quality. Parts per Million is used in chemical analysis.

Quick Tip

Accurate testing ensures fabric durability and performance.

Question 73.

Match List I with List II:

List I (Processed Foods):

- (A) Manufactured Foods
- (B) Food Derivatives
- (C) Functional Foods
- (D) Medical Foods

List II (Examples):

- (I) Low Sodium Salt
- (II) Probiotics
- (III) Pickles, Jams, Marmalades, Squashes
- (IV) Conversion of Oil to Vanaspati

Options:

- (1) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)
- (2) (A) - (I), (B) - (III), (C) - (IV), (D) - (II)
- (3) (A) - (IV), (B) - (II), (C) - (I), (D) - (III)
- (4) (A) - (III), (B) - (IV), (C) - (II), (D) - (I)

Correct Answer: (1) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Solution:

Matching involves associating processed food categories with their examples.

Quick Tip

Classification aids in understanding food processing techniques.

Question 74.

Name the process of problem-solving with the purpose of getting a "zero-defect" product in a

garment industry:

Options:

- (1) Quality Assurance
- (2) Quality Control
- (3) Quality Management
- (4) Quality Specifications

Correct Answer: (2) Quality Control

Solution:

Quality control involves identifying and eliminating defects in production to achieve a "zero-defect" standard.

Quick Tip
Systematic quality control ensures consistent product excellence.

Question 75.

Red Ribbon Express (RRE) is a nationwide campaign for generating awareness on:

Options:

- (1) Malaria
- (2) Breast Cancer
- (3) AIDS
- (4) Diabetes

Correct Answer: (3) AIDS

Solution:

Red Ribbon Express is an innovative campaign aimed at spreading awareness about HIV/AIDS and related health issues in India.

Quick Tip
Awareness initiatives play a critical role in preventing and managing public health crises.