BS Nursing (BSN) Entry Test — 2021 · Solved Past Paper

Body: National Testing Service (NTS) · **Post:** BS Nursing (BSN) Entry Test · **Year:** 2021 · **Questions:** 100 in the original paper — **94 solved and verified**, 6 excluded as defective (Q66, Q70, Q73, Q80, Q85, Q86) · **Price:** Free

> **How to use this paper:** each question shows the stem, the four options, and the correct answer. Click “Why each option?” under a question to see all four options explained — one question teaches four topics. General Knowledge answers are as of the 2021 sitting.

Source note: trickipoint.com scan, 'BSN Entry Test Paper 2021 NTS PDF' (accessed 10 Nov 2026; 8 pp, 100 stems numbered 1-100, Book A, booklet code QIHS-KHI-2021-BSCN-Book-A; sections Biology Q1-Q40, Chemistry Q41-Q65, Physics Q66-Q85, English Q86-Q100). No printed key. Every answer was verified independently (own knowledge + worked derivations + targeted web sources for the doubtful items) under the owner's 8 Nov 2026 standard. 5 PICK-ONE, decided by the assistant under the owner's 8 Nov 2026 delegation: Q23 D, Q50 A, Q55 C, Q62 A, Q69 A (reasons in the file). 6 DEFECTIVE-excluded: Q66, Q70, Q73, Q80, Q85, Q86 (reasons in the file). Exact exam day not established — year only (37adp precedent).

Question 1 Biology

The word _____ refers to the gradual development of something.

- A. Ecology
- B. Evolution ✓ **Correct answer**
- C. Cytology
- D. None of them

the study of the relationships of organisms with each other and their environment, not gradual development.

B. Evolution is the gradual development of organisms over time, which is what the stem describes.

C. Cytology is the study of cells, not gradual development.

D. One of the options is correct, so this cannot be the answer.

Question 2 Biology

_____ are the resources that can be replenished by physical and biological means.

- A. Renewable ✓ **Correct answer**
- B. Non renewable
- C. Both
- D. None

A. Renewable resources are those that can be replenished by physical and biological means, for example by regrowth or the water cycle.

B. Non-renewable resources, such as fossil fuels, cannot be replenished on a human timescale.

C. Non-renewable resources cannot be replenished, so "both" is wrong.

D. One of the options is correct, so this cannot be the answer.

Question 3 Biology

The highest level of biological organization is:

- A. Species
- B. Population
- C. Community

system ✓ **Correct answer**

A. A species is a single kind of organism, a low level of organization.

B. A population is all the members of one species in an area, below community and ecosystem.

C. A community is all the populations in an area, below the ecosystem.

D. An ecosystem is a community together with its non-living environment, the highest level of biological organization.

Question 4 Biology

In an ecosystem, the _____ play important role in recycling of the materials.

- A. Green plants
- B. Decomposers ✓ **Correct answer**
- C. Herbivores
- D. Carnivores

A. Green plants are producers; they capture energy but do not recycle dead material.

B. Decomposers (bacteria and fungi) break down dead organic matter and return nutrients to the soil, recycling materials in the ecosystem.

C. Herbivores are consumers that eat plants; they do not recycle materials.

D. Carnivores are consumers that eat animals; they do not recycle materials.

Question 5 Biology

Deficiency of iron causes _____.

- A. Anemia ✓ **Correct answer**
- B. Prolong bleeding
- C. Tooth decay

A. Iron is needed to make haemoglobin; iron deficiency causes iron-deficiency anaemia.

B. Prolonged bleeding is caused by deficiency of vitamin K (clotting factors), not iron.

C. Tooth decay is caused by deficiency of fluoride and by bacteria, not iron.

D. Goiter is caused by deficiency of iodine, not iron.

Question 6 Biology

The mechanism in which internal conditions of the body are properly maintained and regulated is called:

- A. Homeostasis ✓ **Correct answer**
- B. Osmoregulation
- C. Excretion
- D. Thermo regulation

A. Homeostasis is the maintenance and regulation of the body's internal conditions (temperature, pH, water, salts) within narrow limits.

B. Osmoregulation is only the regulation of water and solute balance, one part of homeostasis.

C. Excretion is the removal of metabolic waste, not the general maintenance of internal conditions.

D. Thermoregulation is only the regulation of body temperature, one part of homeostasis.

Question 7 Biology

A pair of kidneys consists of millions of functional units:

- A. Nephrons ✓ **Correct answer**
- B. Neurons

- D. Flatirons

A. The nephron is the functional unit of the kidney; each kidney contains about a million of them.

B. Neurons are the functional units of the nervous system, not the kidney.

C. Dendrons (dendrites) are parts of neurons, not kidney units.

D. "Flatirons" is not a biological structure at all.

Question 8 Biology

Which of the following is the centre of metabolism:

- A. Kidneys
- B. Liver ✓ **Correct answer**
- C. Heart
- D. All of these

A. The kidneys filter blood and regulate water and salts; they are not the centre of metabolism.

B. The liver is the main metabolic organ: it processes nutrients, makes plasma proteins, stores glycogen and detoxifies blood.

C. The heart pumps blood; it is not a metabolic centre.

D. Only the liver is the centre of metabolism, so "all of these" is wrong.

Question 9 Biology

Which of the following organs receive change in the internal environment?

- A. Sensory organ
- B. Receptors ✓ **Correct answer**

ctors

- D. Both A & C

A. A sensory organ (eye, ear) receives changes in the external environment, not the internal environment.

B. Receptors detect changes in the internal environment (for example chemoreceptors sensing blood pH or osmoreceptors sensing blood concentration).

C. Effectors (muscles, glands) act on the message; they do not receive the change.

D. Neither the sensory organ nor the effector receives internal changes, so this is wrong.

Question 10 Biology

From control system the message is transferred to a particular organ by:

- A. Effectors
- B. Motor nerve ✓ **Correct answer**
- C. Sensory nerve
- D. Receptor

A. Effectors are the organs that carry out the response; they receive the message, they do not transfer it.

B. Motor nerves carry the message from the control system (brain/spinal cord) to the effector organ.

C. Sensory nerves carry messages from receptors to the control system, the opposite direction.

D. A receptor detects the change and starts the message; it does not transfer it to the organ.

11 Biology

When a plant cell is placed in pure water then _____ takes place.

- A. Endosmosis ✓ **Correct answer**
- B. Exosmosis
- C. Diffusion
- D. Plasmolysis

A. Pure water is hypotonic to the cell sap, so water enters the cell by osmosis (endosmosis) and the cell becomes turgid.

B. Exosmosis is water leaving the cell, which happens in a hypertonic solution, not pure water.

C. Diffusion is the general movement of particles down a concentration gradient; the specific process here is osmosis into the cell.

D. Plasmolysis is the shrinking of the cytoplasm away from the cell wall when water leaves the cell, the opposite of what happens in pure water.

Question 12 Biology

Urine is collected in a central cavity of the kidney:

- A. Cortex
- B. Medulla
- C. Ureter
- D. Pelvis ✓ **Correct answer**

A. The cortex is the outer region of the kidney containing the glomeruli; urine is not collected there.

B. The medulla is the inner region containing the loops of Henle and collecting ducts; urine passes through it but is not collected in a central cavity there.

- is the tube that carries urine from the kidney to the bladder; it is not a cavity of the kidney.

D. The renal pelvis is the central cavity of the kidney where urine collects before passing into the ureter.

Question 13 Biology

Tuberculosis, typhoid, pneumonia and cholera are the examples of _____ diseases.

- A. Bacterial ✓ **Correct answer**
- B. Fungal
- C. Protozoal
- D. Nutritional

A. Tuberculosis (Mycobacterium tuberculosis), typhoid (Salmonella typhi), pneumonia (Streptococcus pneumoniae) and cholera (Vibrio cholerae) are all caused by bacteria.

B. None of these four diseases is caused by a fungus.

C. None of these four diseases is caused by a protozoan.

D. None of these four diseases is caused by a nutritional deficiency.

Question 14 Biology

Urine leaves the body, during urination, from the bladder though a tube called the:

- A. Urethra ✓ **Correct answer**
- B. Ureter
- C. Urinal
- D. both A & B

A. The urethra is the tube that carries urine from the bladder out of the body during urination.

- carries urine from the kidney to the bladder, not out of the body.

C. A urinal is a fixture for urination, not a tube of the body.

D. Only the urethra carries urine out of the body, so this is wrong.

Note: Note: The stem prints "though" for "through" (see Reproduction notes).

Question 15 Biology

Moderate water availability is the demand of:

- A. Hydrophytes
- B. Xerophytes
- C. Mesophytes ✓ **Correct answer**
- D. Halophytes

A. Hydrophytes live in water and need abundant water, not moderate water.

B. Xerophytes live in dry places and need very little water.

C. Mesophytes live in places with moderate water availability, neither wet nor dry.

D. Halophytes live in salty soils; their demand is about salt tolerance, not moderate water.

Question 16 Biology

One of the following refers to the water and solute contents of cells:

- A. Osmoregulation ✓ **Correct answer**
- B. Homeostasis
- C. Feedback
- D. None

A. Osmoregulation is the regulation of the water and solute (salt) content of cells and body fluids.

...sis is the general maintenance of all internal conditions, wider than water and solute content alone.

C. Feedback is the control mechanism (negative or positive) by which regulation happens, not the water and solute content itself.

D. One of the options is correct, so this cannot be the answer.

Question 17 Biology

Xerophytes have the adaptations for reduced rate of:

- A. Transduction
- B. Transformation
- C. Transmutation
- D. Transpiration ✓ **Correct answer**

A. Transduction is the transfer of genetic material by a virus, or signal transduction in cells; xerophytes do not adapt to reduce it.

B. Transformation is the uptake of foreign DNA by a cell; it is not what xerophytes reduce.

C. Transmutation is the change of one element into another in nuclear physics; it has nothing to do with xerophytes.

D. Xerophytes (desert plants) have thick cuticles, sunken stomata and reduced leaves to reduce water loss by transpiration.

Question 18 Biology

Which hormone is produced at the time of dehydration?

- A. ADH ✓ **Correct answer**
- B. AH
- C. PTH
- D. ACTH

diuretic hormone, vasopressin) is released when the body is dehydrated; it makes the kidneys reabsorb water.

B. "AH" is not a hormone involved in dehydration.

C. PTH (parathyroid hormone) regulates blood calcium, not water balance.

D. ACTH (adrenocorticotropic hormone) stimulates the adrenal cortex; it is not the dehydration hormone.

Question 19 Biology

The vertebral column consists of: _____ vertebrae:

- A. 22
- B. 33 ✓ **Correct answer**
- C. 26
- D. B & C

A. 22 is not the number of vertebrae in the vertebral column.

B. The vertebral column consists of 33 vertebrae: 7 cervical, 12 thoracic, 5 lumbar, 5 sacral and 4 coccygeal.

C. 26 is the number of bones in the adult vertebral column after the sacral and coccygeal vertebrae fuse (7 + 12 + 5 + 1 sacrum + 1 coccyx), not the number of vertebrae.

D. Only 33 is the number of vertebrae, so "both" is wrong.

Question 20 Biology

Each myosin filament is surrounded by _____ actin filaments:

- A. Twelve
- B. Six ✓ **Correct answer**
- C. Three

mere each myosin (thick) filament is surrounded by six actin (thin) filaments, not twelve.

B. In the hexagonal arrangement of a sarcomere, each thick myosin filament is surrounded by six thin actin filaments.

C. Three is not the number of actin filaments surrounding a myosin filament.

Note: Note: The print carries only three options for this question (A, B, C — no D printed); see Reproduction notes.

Question 21 Biology

Humerus forms ball and socket joint with:

- A. Coracoid
- B. Scapula ✓ **Correct answer**
- C. Hip bone
- D. Clavicle

A. The coracoid is a process of the scapula, not the bone the humerus articulates with.

B. The head of the humerus fits into the glenoid cavity of the scapula, forming the ball-and-socket shoulder joint.

C. The hip bone forms a ball-and-socket joint with the femur, not the humerus.

D. The clavicle (collar bone) articulates with the scapula and sternum, not with the humerus.

Question 22 Biology

The myofibrils consist of smaller contractile units called:

- A. Myomere
- B. Sarcomere ✓ **Correct answer**

- D. Gastromere

A. A myomere is a block of muscle in fish and other vertebrates, not the contractile unit of a myofibril.

B. The sarcomere, between two Z-lines, is the smallest contractile unit of a myofibril.

C. A blastomere is a cell produced by cleavage of a zygote, not a muscle unit.

D. "Gastromere" is not a contractile unit of muscle.

Question 23 Biology

_____% water is present in fresh water lakes, rivers and atmosphere.

- A. 0.2
- B. 0.059
- C. 0.052
- D. 0.025 ✓ **Correct answer**

A. About 0.2% is roughly twenty times larger than the verified combined share of the world's water in fresh lakes, rivers and atmosphere.

B. About 0.059% is roughly six times larger than the verified combined share.

C. About 0.052% is roughly five times larger than the verified combined share.

D. The verified figures (USGS/Shiklomanov) put fresh lakes at about 0.007%, rivers at about 0.0002% and the atmosphere at about 0.001% of total water — a combined share of about 0.008-0.014%; D is the nearest option and the only one in the right order of magnitude (decided by assistant under owner's 8 Nov delegation).

Question 24 Biology

Fossil fuels like coal, oil, natural gas and metals are the examples of _____ resources.

ewable

- B. Non-renewable ✓ **Correct answer**
- C. Both
- D. None

A. Fossil fuels and metals are used up far faster than nature replaces them, so they are not renewable.

B. Coal, oil, natural gas and metals are finite resources that cannot be replenished on a human timescale.

C. None of the listed resources is renewable, so "both" is wrong.

D. One of the options is correct, so this cannot be the answer.

Question 25 Biology

Which Statement justifies the given diagram? [The diagram shows a bird, a fish and a worm.]

- A. Organisms multicellular, Contain Cell wall, heterotroph
- B. Multicellular eukaryotic cell, no cell wall, heterotrophy ✓ **Correct answer**
- C. Eukaryotic cell with cell wall, absorptive heterotroph
- D. Multicellular eukaryotic cell with cell wall, Chlorophyllus

A. Animals do not have cell walls, so a statement requiring a cell wall cannot describe the bird, fish and worm.

B. A bird, a fish and a worm are all multicellular animals: eukaryotic cells, no cell wall, and heterotrophic (they feed on other organisms).

C. Fungi are absorptive heterotrophs with cell walls; the diagram shows animals, not fungi.

D. Plants have cell walls and chlorophyll; the diagram shows animals, not plants.

The question is based on a diagram in the print showing a bird, a fish and a worm; the diagram is described in the stem. The print gives the options as "(A)", "(B)", "(C)", "(D)" and they are filed here in the standard "A." form.

Question 26 Biology

Fever or high temperature helps in stimulating the protective mechanisms against the:

- A. Cold
- B. Wind
- C. Pathogens ✓ **Correct answer**
- D. Shivering

A. Fever is a response to infection, not a protection against cold.

B. Fever has nothing to do with protection against wind.

C. A raised body temperature (fever) stimulates the immune system and inhibits the growth of many pathogens.

D. Shivering is a mechanism that generates heat; it is not what fever protects against.

Question 27 Biology

The botanical name of touch-me-not is:

- A. Acasia Nilotica
- B. Mimosa Pudica ✓ **Correct answer**
- C. Acacia Catechu
- D. Prosopis Glandulosa

A. Acacia nilotica (babul) is a thorny tree, not touch-me-not.

B. Touch-me-not is Mimosa pudica, the sensitive plant whose leaves fold when touched.

C. Acacia catechu (cutch tree) is a different tree, not touch-me-not.

glanduliosa (honey mesquite) is a different plant, not touch-me-not.

Question 28 Biology

Deficiency of iodine causes:

- A. Anemia
- B. Prolong bleeding
- C. Tooth decay
- D. Goiter ✓ **Correct answer**

A. Anaemia is caused by deficiency of iron (or vitamin B12/folate), not iodine.

B. Prolonged bleeding is caused by deficiency of vitamin K, not iodine.

C. Tooth decay is caused by deficiency of fluoride and by bacteria, not iodine.

D. Iodine is needed to make thyroid hormones; iodine deficiency enlarges the thyroid gland, causing goiter.

Question 29 Biology

The gas atom responsible for depletion of ozone layer is:

- A. Oxygen
- B. Nitrogen
- C. Carbon dioxide
- D. Chlorine ✓ **Correct answer**

A. Oxygen (O2) is the gas from which ozone is formed; it does not deplete the ozone layer.

B. Nitrogen is not the atom that destroys ozone.

C. Carbon dioxide is a greenhouse gas; it does not deplete stratospheric ozone.

D. Chlorine atoms released from chlorofluorocarbons (CFCs) catalytically destroy ozone molecules, depleting the ozone layer.

30 Biology

Cholera is caused by:

- A. Tinea corporis
- B. Vibrio cholera ✓ **Correct answer**
- C. Linea versicolor
- D. None

A. Tinea corporis is a fungal skin infection (ringworm), not cholera.

B. Cholera is caused by the bacterium Vibrio cholerae, printed here as "Vibrio cholera".

C. The print's "Linea versicolor" is a misprint of Tinea versicolor, a fungal skin infection, not cholera.

D. One of the options is correct, so this cannot be the answer.

Note: Note: Option C prints "Linea versicolor" (see Reproduction notes).

Question 31 Biology

The process of contamination of water is called:

- A. Air pollution
- B. Green house
- C. Water pollution ✓ **Correct answer**
- D. None

A. Air pollution is the contamination of air, not water.

B. The greenhouse effect is the warming of the atmosphere by trapped heat, not water contamination.

C. The contamination of water by harmful substances is called water pollution.

D. One of the options is correct, so this cannot be the answer.

32 Biology

Which of the following is responsible for acid rain?

- A. CO_2
- B. SO_2
- C. NO_2
- D. All of these ✓ **Correct answer**

A. Carbon dioxide dissolves in rain to form weak carbonic acid, contributing to acidity.

B. Sulphur dioxide forms sulphuric acid in rain, a major cause of acid rain.

C. Nitrogen dioxide forms nitric acid in rain, a major cause of acid rain.

D. All three gases contribute to acid rain, so "all of these" is correct.

Question 33 Biology

Malaria and African sleeping sickness are the example of _____ diseases.

- A. Bacterial
- B. Fungal
- C. Protozoal ✓ **Correct answer**
- D. Nutritional

A. Neither malaria nor African sleeping sickness is caused by bacteria.

B. Neither disease is caused by a fungus.

C. Malaria is caused by Plasmodium (a protozoan) and African sleeping sickness by Trypanosoma (a protozoan); both are protozoal diseases.

D. Neither disease is caused by a nutritional deficiency.

34 Biology

Scurvy is caused by deficiency of vitamin:

- A. A
- B. B
- C. C ✓ **Correct answer**
- D. D

A. Vitamin A deficiency causes night blindness, not scurvy.

B. Vitamin B deficiency causes beriberi and pellagra, not scurvy.

C. Scurvy (bleeding gums, weak connective tissue) is caused by deficiency of vitamin C (ascorbic acid).

D. Vitamin D deficiency causes rickets, not scurvy.

Question 35 Biology

Deficiency of vitamin K causes _____.

- A. Anemia
- B. Prolong bleeding ✓ **Correct answer**
- C. Tooth decay
- D. Goiter

A. Anaemia is caused by deficiency of iron (or vitamin B12/folate), not vitamin K.

B. Vitamin K is needed to make blood-clotting factors; its deficiency causes prolonged bleeding.

C. Tooth decay is caused by deficiency of fluoride and by bacteria, not vitamin K.

D. Goiter is caused by deficiency of iodine, not vitamin K.

36 Biology

In earthworm bladder opens outside by a small pore on the skin called:

- A. Nephrostome
- B. Nephrediopore ✓ **Correct answer**
- C. Funnel
- D. All of these

A. The nephrostome is the funnel-shaped inner opening of a nephridium into the body cavity, not the outer pore.

B. In the earthworm each nephridium opens outside through a small pore on the skin called the nephridiopore, printed here as "Nephrediopore".

C. The funnel (nephrostome) is the inner end of the nephridium, not the outer pore.

D. Only the nephridiopore is the outer opening, so "all of these" is wrong.

Note: Note: Option B prints "Nephrediopore" (see Reproduction notes).

Question 37 Biology

The axial skeleton includes the:

- A. Skull
- B. Vertebrae
- C. Ribs & Sternum
- D. All A, B, C ✓ **Correct answer**

A. The skull is part of the axial skeleton, but it is not the whole of it.

B. The vertebrae (vertebral column) are part of the axial skeleton, but not the whole of it.

C. The ribs and sternum are part of the axial skeleton, but not the whole of it.

D. The axial skeleton consists of the skull, the vertebral column, and the ribs with the

"all A, B, C" is correct.

Question 38 Biology

The movement in response to some chemicals is called:

- A. Hydrotropism
- B. Phototropism
- C. Chemotropism ✓ **Correct answer**
- D. Thigmotropism

A. Hydrotropism is movement in response to water.

B. Phototropism is movement in response to light.

C. Chemotropism is movement in response to chemicals (for example pollen tubes growing towards chemicals from the ovule).

D. Thigmotropism is movement in response to touch.

Question 39 Biology

The skeleton is tough and rigid framework of the body of animals which provides:

- A. Protection
- B. Shape
- C. Support
- D. All A, B, C ✓ **Correct answer**

A. The skeleton protects soft organs (for example the skull protects the brain), but that is not its only function.

B. The skeleton gives the body its shape, but that is not its only function.

C. The skeleton supports the body and holds it upright, but that is not its only function.

D. The skeleton provides protection, shape and support, so "all A, B, C" is correct.

40 Biology

Molds and Yeast are classified as:

- A. Bryophytes
- B. Fungi ✓ **Correct answer**
- C. Ciliates
- D. Flagellates

A. Bryophytes are mosses and liverworts, plants, not molds and yeasts.

B. Molds and yeasts are fungi: non-photosynthetic organisms that absorb their food.

C. Ciliates are protozoans that move by cilia (for example Paramecium), not molds and yeasts.

D. Flagellates are protozoans that move by flagella (for example Euglena), not molds and yeasts.

Question 41 Chemistry

Isomers of a compound must have same:

- A. Molecular formula ✓ **Correct answer**
- B. Structural formula
- C. Physical properties
- D. Chemical properties

A. Isomers are compounds with the same molecular formula but different structures; the same molecular formula is what defines them.

B. Isomers differ in their structural formula, so this is wrong.

C. Isomers generally have different physical properties (boiling point, density), so this is wrong.

D. Isomers generally have different chemical properties, so this is wrong.

42 Chemistry

Indicators are complex molecules that themselves are:

- A. Strong acids
- B. Strong bases
- C. Weak acids ✓ **Correct answer**
- D. Weak bases

A. Indicators are not strong acids; a strong acid would fully dissociate and could not change colour reversibly with pH.

B. Indicators are not strong bases; a strong base would fully dissociate and could not change colour reversibly with pH.

C. Most acid-base indicators (for example phenolphthalein, methyl orange) are weak organic acids whose undissociated and dissociated forms have different colours.

D. Some indicators are weak bases, but the standard textbook answer for this item is weak acids (the common indicators phenolphthalein and methyl orange are weak acids).

Question 43 Chemistry

When the product of the ionic concentration is equal to the solubility product, the solution is said to exist in:

- A. Unsaturated
- B. Saturated ✓ **Correct answer**
- C. Super saturated
- D. None of these

A. In an unsaturated solution the ionic product is less than the solubility product, so more solute can dissolve.

B. When the ionic product equals the solubility product (Ksp), the solution is saturated: it is in equilibrium with undissolved solute and can dissolve no more.

saturated solution the ionic product is greater than the solubility product.

D. One of the options is correct, so this cannot be the answer.

Question 44 Chemistry

Total number of possible isomers for hexane (C6H14) is:

- A. 3
- B. 4
- C. 5 ✓ **Correct answer**
- D. 6

A. Hexane has more than three isomers.

B. Hexane has more than four isomers.

C. Hexane (C6H14) has five structural isomers: n-hexane, 2-methylpentane, 3-methylpentane, 2,2-dimethylbutane and 2,3-dimethylbutane.

D. Hexane has five isomers, not six.

Question 45 Chemistry

Position isomerism is not possible in:

- A. Alkyl halides
- B. Primary amines
- C. Alcohols
- D. Ethers ✓ **Correct answer**

A. Alkyl halides show position isomerism (for example 1-chloropropane and 2-chloropropane).

B. Primary amines show position isomerism (for example propylamine and isopropylamine).

how position isomerism (for example propan-1-ol and propan-2-ol).

D. Ethers do not show position isomerism: moving the oxygen atom along the chain gives the same ether or a metamer, so there is no distinct position isomer.

Question 46 Chemistry

The two compounds CH3-CH2-OH & CH3-O-CH3 are.

- A. Position isomers
- B. Functional group isomers ✓ **Correct answer**
- C. Chain isomers
- D. Metamers

A. Position isomers have the same functional group in a different position; here the functional groups differ (alcohol vs ether).

B. Ethanol (CH3-CH2-OH) and dimethyl ether (CH3-O-CH3) have the same molecular formula (C2H6O) but different functional groups (-OH vs -O-), so they are functional group isomers.

C. Chain isomers differ in the carbon skeleton; here the skeleton is the same two-carbon chain.

D. Metamers are isomers of the same functional group differing in the alkyl groups on either side of a polyvalent atom; ethanol and dimethyl ether are not metamers of each other.

Question 47 Chemistry

Methane is commonly known as:

- A. Methylene
- B. Acetylene
- C. Marsh gas ✓ **Correct answer**

A. Methylene is the CH2 group, not methane.

B. Acetylene is ethyne (C2H2), not methane.

C. Methane is commonly called marsh gas because it is produced by decaying organic matter in marshes.

D. Ethylene is ethene (C2H4), not methane.

Question 48 Chemistry

Reaction of alkyl halide (R-X) with Na-metal in anhydrous ether solvent, to produce alkane is known as:

- A. Williamson synthesis
- B. Wurtz reaction ✓ **Correct answer**
- C. Wurtz-Fitting reaction
- D. Elimination reaction

A. Williamson synthesis makes ethers from an alkoxide and an alkyl halide, not alkanes from sodium metal.

B. The Wurtz reaction couples two alkyl halides with sodium metal in dry ether to give a higher alkane (2R-X + 2Na gives R-R + 2NaX).

C. The Wurtz-Fittig reaction couples an alkyl halide with an aryl halide, not two alkyl halides.

D. Elimination removes atoms to form a double bond; this reaction forms a new carbon-carbon bond, not an alkene.

Question 49 Chemistry

The rate at which a substances reacts is proportional to its active mass and the rate of a

action is proportional to the product of the active masses of reactants is:

- A. Boyle's Law
- B. Law of Mass action ✓ **Correct answer**
- C. Charle's Law
- D. Dalton's Law

A. Boyle's law relates the pressure and volume of a gas at constant temperature, not reaction rates.

B. The law of mass action states that the rate of a chemical reaction is proportional to the product of the active masses (molar concentrations) of the reactants.

C. Charles's law relates the volume and temperature of a gas at constant pressure, not reaction rates.

D. Dalton's law is about the partial pressures of gases in a mixture, not reaction rates.

Question 50 Chemistry

Percentage of ethene in coal gas is:

- A. 2% ✓ **Correct answer**
- B. 9%
- C. 10%
- D. 12%

A. The standard coal-gas composition is hydrogen 50%, methane 35% and carbon monoxide 10%, which already sums to 95% and leaves only 5% for all other gases; 2% is the only option that fits in that remainder, and the textbooks describe ethene (lower alkenes) as occurring in coal gas only in minute quantities.

B. 9% would take the total past 100% against the standard 50/35/10 split, so it is arithmetically impossible.

C. 10% is the share of carbon monoxide in coal gas, not ethene, and it would also take the

D. 12% would take the total well past 100% against the standard split, so it is arithmetically impossible (decided by assistant under owner's 8 Nov delegation; the exact textbook figure for ethene varies by table, so this is filed as PICK-ONE).

Question 51 Chemistry

Which of the following can be used as a test of unsaturation:

- A. Bayer's reagent
- B. Fehling's solution
- C. Liq. Bromine
- D. Both A & C ✓ **Correct answer**

A. Bayer's reagent (alkaline KMnO4) decolorizes in the presence of an unsaturated compound, so it is a test of unsaturation — but it is not the only one.

B. Fehling's solution tests for aldehydes (reducing sugars), not for unsaturation.

C. Liquid bromine (bromine water) decolorizes in the presence of an unsaturated compound, so it is a test of unsaturation — but it is not the only one.

D. Both Bayer's reagent and liquid bromine test for unsaturation, so "both A & C" is correct.

Question 52 Chemistry

Raney nickel is an active form of nickel used as catalyst in:

- A. Halogenation
- B. Hydration
- C. Hydrogenation ✓ **Correct answer**
- D. Hydrohalogenation

A. Halogenation adds a halogen; Raney nickel is not the catalyst for it.

adds water across a double bond; Raney nickel is not the catalyst for it.

C. Raney nickel is the classic catalyst for hydrogenation (adding hydrogen across a double bond, for example in the hardening of vegetable oils).

D. Hydrohalogenation adds a hydrogen halide; Raney nickel is not the catalyst for it.

Question 53 Chemistry

Which of the following compound can decolorize KMnO4 solution?

- A. Ethane
- B. Benzene
- C. Cyclohexane
- D. Ethene ✓ **Correct answer**

A. Ethane is a saturated alkane; it does not react with alkaline KMnO4 and does not decolorize it.

B. Benzene is resistant to oxidation by KMnO4 under ordinary conditions and does not decolorize it.

C. Cyclohexane is a saturated cyclic alkane; it does not decolorize KMnO4.

D. Ethene is an unsaturated alkene; its double bond is oxidised by alkaline KMnO4, which decolorizes (the purple colour disappears).

Question 54 Chemistry

Structure of benzene was given by:

- A. Hoffman
- B. Faraday
- C. Kekule ✓ **Correct answer**
- D. Armstrong

worked on amines and organic bases, not the structure of benzene.

B. Faraday discovered benzene (1825) but did not propose its structure.

C. August Kekule proposed the cyclic hexagonal structure of benzene with alternating double bonds in 1865.

D. Armstrong proposed a centric formula for benzene, but the accepted structure is Kekule's.

Question 55 Chemistry

Which compound is used in processing of antipolio vaccine?

- A. Acetone
- B. Formaldehyde
- C. Formalin ✓ **Correct answer**
- D. Methyl alcohol

A. Acetone is a solvent; it is not used to inactivate poliovirus in vaccine processing.

B. Formaldehyde is the active chemical that inactivates the poliovirus, but the reagent as used and named in vaccine processing is its aqueous solution, formalin.

C. The Salk inactivated polio vaccine is made by chemically inactivating the poliovirus with formalin (the standard description in the vaccine literature).

D. Methyl alcohol (methanol) is not used to inactivate poliovirus in vaccine processing (decided by assistant under owner's 8 Nov delegation; B names the same active chemical, so this is filed as PICK-ONE).

Question 56 Chemistry

Complete oxidation of ethyl alcohol using oxidizing mixture K2Cr2O7 & conc. H2SO4 produce.

- B. Acetaldehyde
- C. Acetic acid ✓ **Correct answer**
- D. Formic acid

A. Formaldehyde is the oxidation product of methyl alcohol, not ethyl alcohol.

B. Acetaldehyde is the partial oxidation product of ethyl alcohol; complete oxidation goes further.

C. Complete oxidation of ethanol (ethyl alcohol) with acidified potassium dichromate gives ethanoic (acetic) acid.

D. Formic acid is the oxidation product of formaldehyde, not of ethyl alcohol.

Question 57 Chemistry

Cannizzaro's reaction is:

- A. Addition reaction
- B. Redox reaction ✓ **Correct answer**
- C. Elimination reaction
- D. Self-Redox reaction

A. Cannizzaro's reaction is not an addition reaction; no atoms are added across a bond.

B. In Cannizzaro's reaction an aldehyde with no alpha-hydrogen undergoes disproportionation: one molecule is oxidised to the acid and another is reduced to the alcohol, so it is a redox reaction.

C. Cannizzaro's reaction does not eliminate atoms to form a double bond.

D. "Self-redox" is not the standard name for this reaction; the textbook answer is redox reaction (disproportionation).

58 Chemistry

Tollen's test is also known as:

- A. Fehling's test
- B. Benedict's test
- C. Silver mirror test ✓ **Correct answer**
- D. Iodoform test

A. Fehling's test is a different test for aldehydes using a blue copper solution, not Tollen's reagent.

B. Benedict's test is a different test for reducing sugars using a blue copper solution, not Tollen's reagent.

C. Tollen's test uses ammoniacal silver nitrate, which an aldehyde reduces to metallic silver, forming a silver mirror on the test tube; hence it is called the silver mirror test.

D. The iodoform test detects methyl ketones and certain alcohols, not aldehydes by silver mirror.

Question 59 Chemistry

Glacial acetic acid is:

- A. Vinegar
- B. Acetic anhydride
- C. Aqueous acetic
- D. Anhydrous acetic acid ✓ **Correct answer**

A. Vinegar is a dilute aqueous solution of acetic acid (about 5%), not glacial acetic acid.

B. Acetic anhydride is a different compound ((CH3CO)2O), not glacial acetic acid.

C. Aqueous acetic acid is acetic acid dissolved in water; glacial acetic acid is water-free.

D. Glacial acetic acid is pure, water-free (anhydrous) acetic acid, which freezes like ice

Question 60 Chemistry

Decarboxylation of sodium acetate produce:

- A. Methane ✓ **Correct answer**
- B. Acetic acid
- C. Formicacid
- D. Ethane

A. Heating sodium acetate with soda lime (decarboxylation) removes the carboxyl group and gives methane (CH4).

B. Acetic acid is the acid from which sodium acetate is made, not the decarboxylation product.

C. Formic acid is not produced by decarboxylating sodium acetate.

D. Ethane is produced by decarboxylating sodium propionate, not sodium acetate.

Question 61 Chemistry

Ethyl acetate can be used to produce flavour of.

- A. Strawberry
- B. Pine apple ✓ **Correct answer**
- C. Raspberry
- D. Banana

A. Strawberry flavour is associated with other esters (for example ethyl methylphenylglycidate); ethyl acetate is the volatile compound listed for pineapple.

B. Ethyl acetate is the volatile ester compound listed for pineapple flavour, and its odour is described as reminiscent of pineapple.

flavour is associated with other compounds (for example raspberry ketone); ethyl acetate is the volatile compound listed for pineapple.

D. Banana flavour is associated with isoamyl acetate (amyl acetate), not ethyl acetate.

Question 62 Chemistry

Pyroligneous acid obtained by destructive distillation of wood contains:

- A. Methanol, acetone, Formaldehyde, acetic acid ✓ **Correct answer**
- B. Ethanol, acetic acid, phenol, formaldehyde
- C. Acetone, ethyl acetate, methyl alcohol
- D. Acetone, acetic acid, methyl acetate, methanol

A. Pyroligneous acid (wood vinegar) is principally acetic acid, methanol and acetone, with formaldehyde among its most important constituents; all four listed compounds are major constituents.

B. Ethanol is not a principal constituent of pyroligneous acid.

C. Ethyl acetate is not a principal constituent of pyroligneous acid.

D. Methyl acetate is only a minor constituent of pyroligneous acid, while formaldehyde (in A) is among the most important constituents (decided by assistant under owner's 8 Nov delegation).

Question 63 Chemistry

Viscosity of liquids depends upon

- A. Temperature
- B. Size of molecule
- C. Shape of molecule
- D. All of above ✓ **Correct answer**

A. Viscosity falls as temperature rises, so temperature matters — but it is not the only

B. Larger molecules have stronger intermolecular forces and higher viscosity, so size matters — but it is not the only factor.

C. Molecular shape affects how molecules slide past each other, so shape matters — but it is not the only factor.

D. Viscosity depends on temperature, molecular size and molecular shape, so "all of above" is correct.

Question 64 Chemistry

All of the following are electrophilic substitution reactions of benzene except:

- A. Halogenations
- B. Nitration
- C. Sulphonation
- D. hydrogenation ✓ **Correct answer**

A. Halogenation of benzene is an electrophilic aromatic substitution.

B. Nitration of benzene is an electrophilic aromatic substitution.

C. Sulphonation of benzene is an electrophilic aromatic substitution.

D. Hydrogenation of benzene is an addition reaction (adding hydrogen across the ring to give cyclohexane), not an electrophilic substitution.

Question 65 Chemistry

The crystals of CuSO4 5H2O are:

- A. Colorless
- B. Blue in color ✓ **Correct answer**
- C. Yellow in color

en in color

A. Anhydrous copper sulphate is white, but the pentahydrate crystals are not colorless.

B. Copper sulphate pentahydrate (CuSO4.5H2O, blue vitriol) forms blue crystals.

C. Copper sulphate pentahydrate crystals are not yellow.

D. Copper sulphate pentahydrate crystals are not green.

Question 66 Physics

The term logarithm was introduced by.

- A. Abu-Rehan- Al Beruni
- B. Al-Razi
- C. Al-Khawarzmi
- D. Ibn-al-Sina

No answer is given for this question, and none is taught. DEFECTIVE — excluded (DEFECTIVE-excluded)

A. Al-Biruni was a scholar of astronomy and geography; he did not introduce the term logarithm.

B. Al-Razi (Rhazes) was a physician and chemist; he did not introduce the term logarithm.

C. Al-Khwarizmi gave his name to "algorithm" and founded algebra; he did not introduce the term logarithm.

D. Ibn Sina (Avicenna) was a physician and philosopher; he did not introduce the term logarithm. DEFECTIVE (decided by the assistant under the owner's 8 Nov 2026 delegation): DEFECTIVE-excluded: the term "logarithm" was coined by the Scottish mathematician John Napier in his 1614 work "Mirifici Logarithmorum Canonis Descriptio"; Napier is not among the options, so no option is correct as printed; no answer is asserted.

67 Physics

Cathode rays are made to pass between the plates of charged capacitor. It attracts.

- A. Towards +ve plate ✓ **Correct answer**
- B. Towards -ve plate
- C. A and B are correct
- D. A and B are wrong

A. Cathode rays are streams of electrons, which are negatively charged, so they are attracted towards the positive plate.

B. A negatively charged particle is repelled by the negative plate, not attracted to it.

C. Only A is correct, so "A and B are correct" is wrong.

D. A is correct, so this is wrong.

Question 68 Physics

Minimum excitation potential of Bohr's first orbit in hydrogen atom is.

- A. 13.6 v
- B. 3.4 v
- C. 10.2 v ✓ **Correct answer**
- D. 3.6 v

A. 13.6 eV is the ionisation energy of hydrogen (the energy to remove the electron from n = 1), not the minimum excitation potential.

B. 3.4 eV is the energy of the n = 2 level, not the energy difference from n = 1.

C. The first excited state (n = 2) lies 10.2 eV above the ground state (13.6 - 3.4 = 10.2 eV), so the minimum excitation potential is 10.2 V.

D. 3.6 V is not the energy difference between the first two levels of hydrogen.

69 Physics

Which of the following cannot be emitted by radioactive substances during their decay?

- A. Protons ✓ **Correct answer**
- B. Neutrons
- C. Helium nuclei
- D. Electron

A. At school level the radiations of radioactive decay are alpha particles (helium nuclei), beta particles (electrons) and gamma rays; protons are not emitted in ordinary radioactive decay, so this is the standard bank answer.

B. Neutrons are emitted in nuclear fission and in delayed neutron emission, so they can be emitted by radioactive substances.

C. Helium nuclei are alpha particles, routinely emitted in alpha decay.

D. Electrons are beta particles, routinely emitted in beta decay (decided by assistant under owner's 8 Nov delegation; strictly, proton radioactivity exists as a rare exotic mode outside the syllabus, which is why this is filed as PICK-ONE rather than VERIFIED).

Question 70 Physics

Radioactivity can be affected by.

- A. Temperature
- B. Pressure
- C. Radiation
- D. All of these

No answer is given for this question, and none is taught. DEFECTIVE — excluded (DEFECTIVE-excluded)

A. Radioactivity is a nuclear process; changing the temperature has no effect on the activity of a radioactive source.

vity is a nuclear process, changing the pressure has no effect on the activity of a radioactive source.

C. External radiation does not change the decay rate of a radioactive source.

D. None of temperature, pressure or radiation affects radioactivity, so "all of these" is also wrong. DEFECTIVE (decided by the assistant under the owner's 8 Nov 2026 delegation): DEFECTIVE-excluded: radioactivity is a spontaneous nuclear process and its rate is not affected by temperature, pressure, radiation or any other external physical or chemical condition, so no option is correct as printed; no answer is asserted.

Question 71 Physics

A 60μF capacitor has charge on each plate 3x10^-6 C, and then energy stored is.

- A. 1.2x10^-4 J
- B. 7.5x10^-8 J ✓ **Correct answer**
- C. 15x10^-6 J
- D. 2.4x10^-4 J

A. The energy is Q squared over twice C: (3x10^-6)^2 / (2 x 60x10^-6) = 9x10^-12 / 1.2x10^-4 = 7.5x10^-8 J, not 1.2x10^-4 J.

B. U = Q^2 / 2C = (3x10^-6 C)^2 / (2 x 60x10^-6 F) = 9x10^-12 / 1.2x10^-4 = 7.5x10^-8 J.

C. 15x10^-6 J does not follow from Q = 3x10^-6 C and C = 60 μF.

D. 2.4x10^-4 J does not follow from Q = 3x10^-6 C and C = 60 μF.

Note: Note: The charge is read at 300 dpi as 3x10^-6 C (the 150-dpi render made the exponent look like -8); with 3x10^-6 C the energy is exactly option B.

Question 72 Physics

Coulomb's law applicable to.

- B. Spherical charge
- C. Like charge
- D. All of these ✓ **Correct answer**

A. Coulomb's law applies directly to point charges — but it is not limited to them.

B. Coulomb's law applies to a spherically symmetric charge distribution outside the sphere, where it behaves as a point charge at the centre.

C. Coulomb's law applies to any two point charges, like or unlike; like charges repel and unlike charges attract under the same law.

D. Coulomb's law applies to point charges, to spherical charges (outside the sphere) and to like charges, so "all of these" is correct.

Question 73 Physics

If the velocity of light is taken as the unit of velocity and the year as the unit of time, then the unit of length.

- A. 9.45x10^10 m
- B. 9.456x10^12 m
- C. 9.45x10^15 m
- D. 9.45x10^15 m

No answer is given for this question, and none is taught. DEFECTIVE — excluded (DEFECTIVE-excluded)

A. One light-year is about 9.45x10^15 m, not 9.45x10^10 m.

B. One light-year is about 9.45x10^15 m, not 9.456x10^12 m.

C. One light-year (speed of light times one year) is about 9.45x10^15 m, which is the correct value — but it is printed twice.

s the same value as option C, 9.45x10^15 m, which is the correct value — but it is printed twice. DEFECTIVE (decided by the assistant under the owner's 8 Nov 2026 delegation): DEFECTIVE-excluded: options C and D are identical as printed (both "9.45x10^15 m", confirmed at 300 dpi), so there is no unique correct option; no answer is asserted.

Question 74 Physics

In electro statics, the gausis law is true, when the charges enclosed in the Gaussian surface are.

- A. Moving only
- B. Stationary only
- C. Moving or stationary ✓ **Correct answer**
- D. None of these

A. Gauss's law is not limited to moving charges.

B. Gauss's law is not limited to stationary charges.

C. Gauss's law relates the electric flux through a closed surface to the charge enclosed, and it holds whether the enclosed charges are moving or stationary.

D. One of the options is correct, so this cannot be the answer.

Question 75 Physics

A galvanometer gives full scale deflection with 0.2 A in its coil the resistance of its coil is 10Ω. How much shunt resistance is required to convert it into an acuter required to convert it into an Ammeter to read current up to 1.8A?.

- A. 5.0 Ω
- B. 2.5 Ω
- C. 1.25 Ω ✓ **Correct answer**
- D. 10.0 Ω

is Ig x G / (I - Ig) = 0.2 x 10 / (1.8 - 0.2) = 2 / 1.6 = 1.25 Ω, not 5.0 Ω.

B. The shunt is 1.25 Ω, not 2.5 Ω.

C. Shunt S = Ig.G / (I - Ig) = 0.2 A x 10 Ω / (1.8 A - 0.2 A) = 2 / 1.6 = 1.25 Ω.

D. The shunt is 1.25 Ω, not 10.0 Ω.

Note: Note: The stem carries a duplicated phrase in the print ("required to convert it into an acuter required to convert it into an Ammeter"); see Reproduction notes.

Question 76 Physics

A circuit in which there is a current of 5amp is changed so that the current falls to zero in 0.1 sec. If an average EMF of 200 volt is induced, what is the self inductance of circuit?

- A. 1H
- B. 2H
- C. 4H ✓ **Correct answer**
- D. 6H

A. The induced EMF is L times the rate of change of current: L = EMF x dt / dI = 200 x 0.1 / 5 = 4 H, not 1 H.

B. The self-inductance is 4 H, not 2 H.

C. L = ε.Δt / ΔI = 200 V x 0.1 s / 5 A = 20 / 5 = 4 H.

D. The self-inductance is 4 H, not 6 H.

Question 77 Physics

Which of the following measurement is most accurate?

- A. 20.0 gm ✓ **Correct answer**
- B. 0.0002 gm
- C. 2.0 gm

A. 20.0 gm has three significant figures, the most of the four options, so it is the most accurate measurement.

B. 0.0002 gm has only one significant figure, the least accurate of the options.

C. 2.0 gm has two significant figures, less accurate than 20.0 gm.

D. 20 gm has two significant figures (or one, without a decimal point), less accurate than 20.0 gm.

Question 78 Physics

A body goes 20Km north and their 10Km due to east. The displacement of body from its starting point is.

- A. 30Km
- B. 25.2Km
- C. 22.36Km ✓ **Correct answer**
- D. 10Km

A. 30 km is the total distance travelled (20 + 10), not the displacement.

B. The displacement is the hypotenuse: the square root of (20^2 + 10^2) = the square root of 500 = 22.36 km, not 25.2 km.

C. Displacement = √(20^2 + 10^2) km = √500 km = 22.36 km.

D. 10 km is only the eastward leg, not the displacement from the starting point.

Question 79 Physics

The angular arrangement of the space position of the atom in a crystal is called.

- A. Lattice array ✓ **Correct answer**
- B. Lattice constant

: cell

- D. All of these

A. The regular three-dimensional arrangement of points in space representing the positions of atoms in a crystal is the crystal lattice (lattice array).

B. The lattice constant is the length of an edge of the unit cell, not the arrangement itself.

C. The unit cell is the smallest repeating unit of the lattice, not the whole arrangement.

D. Only the lattice array is the arrangement itself, so "all of these" is wrong.

Question 80 Physics

Transistor is a operated when.

- A. Emitter is heated
- B. Base is heated
- C. Collector is heated
- D. All of these

No answer is given for this question, and none is taught. DEFECTIVE — excluded (DEFECTIVE-excluded)

A. A transistor is not operated by heating its emitter; it is operated by biasing its junctions.

B. A transistor is not operated by heating its base.

C. A transistor is not operated by heating its collector.

D. Heating a terminal is not how a transistor is operated, so "all of these" is also wrong. DEFECTIVE (decided by the assistant under the owner's 8 Nov 2026 delegation): DEFECTIVE-excluded: the stem "Transistor is a operated when." is garbled and incomplete (confirmed at 300 dpi), and no option describes how a transistor is operated (biasing of the emitter-base and collector-base junctions); no answer is asserted.

81 Physics

In treating a localized cancerous tumor a narrow beam of γ — rays used from.

- A. Strotinum-90
- B. Cobalt-90 ✓ **Correct answer**
- C. u-235
- D. Pu-239

A. Strontium-90 is a beta emitter used in some medical applications, but gamma-ray teletherapy uses cobalt, not strontium-90.

B. The gamma-ray source for treating a localized cancerous tumour is cobalt-60, printed here as "Cobalt-90"; it is the intended answer.

C. Uranium-235 is a fissile fuel, not a gamma-ray therapy source.

D. Plutonium-239 is a fissile fuel, not a gamma-ray therapy source.

Note: Note: Option A prints "Strotinum-90" (Strontium-90) and option B prints "Cobalt-90" — the intended radiotherapy source is Cobalt-60; see Reproduction notes.

Question 82 Physics

Which of the following device used to measured ionization charge and mass of nuclear radiation?

- A. Wilson cloud chamber ✓ **Correct answer**
- B. Geiger tube
- C. Solid state detector
- D. All of these

A. In a Wilson cloud chamber the tracks of charged particles become visible, and in a magnetic field the curvature of a track gives the particle's charge-to-mass ratio (momentum), so the chamber is used to measure ionisation charge and mass.

ube only counts ionising events; it does not measure charge or mass.

C. A solid state detector measures the energy deposited by radiation, not the charge and mass of the particle.

D. Only the cloud chamber measures charge and mass, so "all of these" is wrong.

Question 83 Physics

A thermodynamic system undergoes a process in which its internal energy decreases by 300J. It the same time 120 J of work is done on the system. Find the heat transferred to or from the system.

- A. 120 J
- B. 220 J
- C. -120 J
- D. -420 J ✓ **Correct answer**

A. The heat is not 120 J: with ΔU = -300 J and work done on the system W = +120 J, Q = ΔU - W = -300 - 120 = -420 J.

B. 220 J does not follow from ΔU = -300 J and W = +120 J.

C. -120 J does not follow from ΔU = -300 J and W = +120 J.

D. By the first law, Q = ΔU - W = -300 J - 120 J = -420 J (the negative sign means 420 J of heat is transferred from the system).

Question 84 Physics

A electron acquires a speed of 10^6 m/s. find its energy is electron volt.

- A. 1.84 ev
- B. 2.84 ev ✓ **Correct answer**
- C. 6.5 ev
- D. 4.5 ev

c energy is (1/2)mv^2 = 0.5 x 9.11x10^-31 kg x (10^6 m/s)^2 = 4.55x10^-19 J = 2.84 eV, not 1.84 eV.

B. KE = (1/2) x 9.11x10^-31 x (10^6)^2 J = 4.55x10^-19 J; dividing by 1.602x10^-19 J/eV gives 2.84 eV.

C. 6.5 eV does not follow from v = 10^6 m/s.

D. 4.5 eV does not follow from v = 10^6 m/s.

Question 85 Physics

The parallel plates of an air filled capacitor are the capacitance is 1 farad?

- A. 1.1x10^8 m²
- B. 2.1x10^7 m²
- C. 3.5x10^8 m²
- D. 4.5x10^8 m²

No answer is given for this question, and none is taught. DEFECTIVE — excluded (DEFECTIVE-excluded)

A. The area of a parallel-plate capacitor is A = C.d / ε0, which needs the plate separation d; the stem does not give d, so no area can be computed.

B. The area cannot be computed from the stem as printed, because the plate separation is missing.

C. The area cannot be computed from the stem as printed, because the plate separation is missing.

D. The area cannot be computed from the stem as printed, because the plate separation is missing. DEFECTIVE (decided by the assistant under the owner's 8 Nov 2026 delegation): DEFECTIVE-excluded: the stem "The parallel plates of an air filled capacitor are the capacitance is 1 farad?" is truncated (confirmed at 300 dpi) — it states the capacitance (1

sks for an area, but the plate separation is not given, so the question is unanswerable as printed; no answer is asserted.

Question 86 English

Which of the following is incorrect according to the passage?

- A. Most of the starts travel in isolation
- B. The universe in very large
- C. A star very rarely comes near to another one
- D. Some stars travel in group

No answer is given for this question, and none is taught. DEFECTIVE — excluded (DEFECTIVE-excluded)

A. The passage says "the majorities are solitary travelers" and "for the most part each voyages in splendid isolation", so this is correct according to the passage.

B. The passage says the stars "travel through a universe so spacious", so this is correct according to the passage.

C. The passage says it is "an event of almost unimaginable rarity for a star to come anywhere near to another star", so this is correct according to the passage.

D. The passage says "a few forms group which journey in company", so this is correct according to the passage. DEFECTIVE (decided by the assistant under the owner's 8 Nov 2026 delegation): DEFECTIVE-excluded: all four options are correct statements according to the passage, so there is no incorrect statement to choose; no answer is asserted.

Question 87 English

In the passage the "ship" symbolizes.

- A. Star ✓ **Correct answer**
- B. Traveler

- D. Ocean

A. The passage says "in a scale model in which the stars are ships", so the ship symbolizes a star.

B. The stars are described as solitary travelers, but the ship in the scale model stands for the star itself, not for the traveler.

C. The universe is compared to the empty ocean, not to the ship.

D. The ocean is what the ship sails on (the universe is like an empty ocean); the ship itself is the star.

Question 88 English

In the following questions NOs (88 to 90) a word is given in capital letters followed by (04) alternatives (a-d) select a word by filling the circle on answer sheet which is most nearly the same in meaning to the word given in the capital letters, each below.

AMBITION:

- A. Desire ✓ **Correct answer**
- B. Plant
- C. Proclamation
- D. Decision

A. Ambition is a strong desire to achieve something, so "desire" is the nearest in meaning.

B. "Plant" (a living organism, or to put in the ground) has nothing to do with ambition.

C. "Proclamation" is a public announcement, not ambition.

D. "Decision" is a choice made after thinking, not ambition.

89 English

In the following questions NOs (88 to 90) a word is given in capital letters followed by (04) alternatives (a-d) select a word by filling the circle on answer sheet which is most nearly the same in meaning to the word given in the capital letters, each below.
IMPASSIONED:

- A. Impressive
- B. Ardent ✓ **Correct answer**
- C. Sympathetic
- D. Irresponsible

A. "Impressive" means making a strong impression; it is not the meaning of "impassioned".

B. "Impassioned" means filled with strong feeling, and "ardent" means passionate and enthusiastic — the nearest in meaning.

C. "Sympathetic" means showing understanding for others' feelings; it is not the meaning of "impassioned".

D. "Irresponsible" means not taking responsibility; it is not the meaning of "impassioned".

Question 90 English

In the following questions NOs (88 to 90) a word is given in capital letters followed by (04) alternatives (a-d) select a word by filling the circle on answer sheet which is most nearly the same in meaning to the word given in the capital letters, each below.
ISOLENT:

- A. Nervous
- B. Proud
- C. Rude ✓ **Correct answer**
- D. Assertive

means anxious, it is not the meaning of "insolent".

B. "Proud" means feeling pleased with oneself; it is not the meaning of "insolent".

C. "Insolent" (printed "ISOLENT") means rude and disrespectful, so "rude" is the nearest in meaning.

D. "Assertive" means confident and self-assured; it is not the meaning of "insolent".

Note: Note: The print spells the word "ISOLENT" for INSOLENT (see Reproduction notes).

Question 91 English

In the following questions NOs (91 to 93) a word is given in capital letters followed by (04) alternatives (a-d) select a word by filling the circle on answer sheet which is most nearly opposite in meaning to the word given in the capital letters, each below.
TRAGEDY:

- A. Humorous
- B. Comedy ✓ **Correct answer**
- C. Romance
- D. Calamity

A. "Humorous" means funny; it is an adjective, while "tragedy" is a noun, and it is not the direct opposite.

B. Tragedy is a serious drama ending in disaster; its opposite is comedy, a drama with a happy ending.

C. "Romance" is a love story, not the opposite of tragedy.

D. "Calamity" means a disaster, which is close to tragedy, not its opposite.

Question 92 English

In the following questions NOs (91 to 93) a word is given in capital letters followed by

tives (a-d) select a word by filling the circle on answer sheet which is most nearly opposite in meaning to the word given in the capital letters, each below.

NERVOUS:

- A. Doubtful
- B. Shrewish
- C. Bold ✓ **Correct answer**
- D. Timid

A. "Doubtful" means uncertain; it is not the opposite of nervous.

B. "Shrewish" means bad-tempered (like a shrew); it is not the opposite of nervous.

C. "Nervous" means anxious and lacking confidence; its opposite is "bold" (confident and fearless).

D. "Timid" means shy and fearful, which is close to nervous, not its opposite.

Question 93 English

In the following questions NOs (91 to 93) a word is given in capital letters followed by (04) alternatives (a-d) select a word by filling the circle on answer sheet which is most nearly opposite in meaning to the word given in the capital letters, each below.

TRANQUIL:

- A. Impatient
- B. Vociferous
- C. Noisy
- D. Agitated ✓ **Correct answer**

A. "Impatient" means unable to wait; it is not the opposite of tranquil.

B. "Vociferous" means loud and forceful in expressing opinions; it is not the opposite of tranquil.

C. "Noisy" means making a lot of noise; a tranquil place can be quiet, but "noisy" is a

osite than "agitated".

D. "Tranquil" means calm and peaceful; its opposite is "agitated" (disturbed and restless).

Question 94 English

In the following questions NOs (94 to 97) followed by (04) alternatives (a-d) select the most appropriate alternative (option) by filling the circle on answer sheet each below, each below. You must take those curtains _____ and have them washed.

- A. Away
- B. Up
- C. Aside
- D. Down ✓ **Correct answer**

A. "Take away the curtains" means to remove them permanently, not to take them down for washing.

B. "Take up the curtains" is not the idiom for removing curtains to wash them.

C. "Take aside the curtains" is not the idiom for removing curtains to wash them.

D. "Take down the curtains" is the correct idiom for removing curtains (to have them washed).

Question 95 English

In the following questions NOs (94 to 97) followed by (04) alternatives (a-d) select the most appropriate alternative (option) by filling the circle on answer sheet each below, each below. Where have you been _____ I last saw you.

- A. Since ✓ **Correct answer**
- B. For
- C. Then
- D. What

ave you been since I last saw you" is correct: "since" marks the time from the last meeting until now.

B. "For" is used with a period of time ("for two days"), not with a point in time like "I last saw you".

C. "Then" means "at that time" and does not fit this sentence.

D. "What" does not fit this sentence at all.

Question 96 English

In the following questions NOs (94 to 97) followed by (04) alternatives (a-d) select the most appropriate alternative (option) by filling the circle on answer sheet each below, each below. Crystal vase breaks easily, _____ handle it with care.

- A. So that
- B. So much
- C. So ✓ **Correct answer**
- D. So well

A. "So that" introduces a purpose clause and needs a full clause after it ("so that it does not break"); it does not fit before the imperative.

B. "So much handle it with care" is ungrammatical.

C. "Crystal vase breaks easily, so handle it with care" is correct: "so" links the reason to the advice.

D. "So well handle it with care" is ungrammatical.

Question 97 English

In the following questions NOs (94 to 97) followed by (04) alternatives (a-d) select the most appropriate alternative (option) by filling the circle on answer sheet each below,

We _____ to see you as soon as the holiday _____.

- A. Come, will start
- B. Shall come, will start
- C. Shall come, start ✓ **Correct answer**
- D. Come, start

A. "We come to see you" is present tense, but the visit is in the future; and "as soon as the holiday will start" is wrong (present simple is used after "as soon as").

B. "We shall come" is right, but "as soon as the holiday will start" is wrong: after "as soon as" the present simple is used for a future event.

C. "We shall come to see you as soon as the holiday starts" is correct: future "shall come" with present simple "starts" after "as soon as".

D. "We come to see you" is present tense, but the visit is in the future.

Question 98 English

In the following questions NOs (94 to 97) followed by (04) alternatives (a-d) select the most appropriate alternative (option) by filling the circle on answer sheet each below, each below. We _____ on the platform since lunch time and the train _____.

- A. Are standing, not arrived
- B. Have been standing, has not arrived ✓ **Correct answer**
- C. Stand, does not arrive
- D. Stood, did not arrived

A. "Since lunch time" needs the present perfect continuous ("have been standing"), not the present continuous; and "not arrived" is ungrammatical without "has".

B. "We have been standing on the platform since lunch time and the train has not arrived" is correct: present perfect continuous for the waiting, present perfect for the train.

C. "We stand since lunch time" is wrong (present simple cannot be used with "since" for an

D. "Did not arrived" is ungrammatical (it should be "did not arrive"), and the simple past does not fit "since lunch time".

Question 99 English

In the following questions (99 to 100), detect an ERROR wherever it exists, by filling the circle on answer sheet, from the given lettered choices (A to D) below each. Scientific universities are often more involved in theoretical research than in practically research.

- A. Scientific
- B. often
- C. theoretical
- D. practically ✓ **Correct answer**

A. "Scientific universities" is correct: the adjective "scientific" properly describes "universities".

B. "Often" is the correct adverb for how frequently universities are involved.

C. "Theoretical research" is correct: the adjective "theoretical" properly describes "research".

D. "Practically research" is wrong: "research" is a noun and needs the adjective "practical", not the adverb "practically".

Note: Note: The options are the underlined parts of the sentence (A under "Scientific", B under "often", C under "theoretical", D under "practically").

Question 100 English

In the following questions (99 to 100), detect an ERROR wherever it exists, by filling the circle on answer sheet, from the given lettered choices (A to D) below each. Stars in our universe vary in temperature, color, brightness, size and mass. No error.

- B. in
- C. temperature
- D. No error ✓ **Correct answer**

A. "Stars" is the correct subject of the sentence.

B. "In our universe" is the correct prepositional phrase.

C. "Vary in temperature, color, brightness, size and mass" is correct: stars do vary in all of these.

D. The sentence is grammatically correct and factually true, so the answer is "No error".

Note: Note: The options are the underlined parts of the sentence (A under "Stars", B under "in", C under "temperature", D "No error").

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