MDCAT (FMDC entry test, PINK) — 2015 · Solved Past Paper

Body: Federal Medical & Dental College (FMDC) · **Post:** MDCAT (FMDC entry test, PINK) · **Year:** 2015 · **Questions:** 100 in the original paper — **98 solved and verified**, 2 excluded as defective (Q36, Q96) · **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 2015 sitting.

Source note: wisegot compilation FMDC PAST-PAPERS.pdf (Google Drive id 1Yp95YFCgM062YJAk4Pq6ez3wopIen37E; 62 pp., text-served), FMDC section lines 1-1130, with the printed answer key Q1-100 in the same file. Cross-checks: archive.org 'FMDC Past Paper.pdf' (the same 100-question bank in a later sitting's reuse); Scribd doc 477319539 'FMDC 2013' by PrepareHOW (the same paper, footer F-15-1290-FM&DC-PINK-111015). Q70 and Q84 option sets are recovered from the archive.org reproduction and confirmed by Scribd doc 673012222 and the learnospot FMDC 2016 quiz (Q70) and by doubtnut / SaraNextGen / getmarks (Q84). Year label: filed as 2015 on the printed footer code 111015 (11 Oct 2015) and the NTS test of 11 October 2015; the compilation headers it 'FMDC 2013 PAST PAPER' and archive.org labels its reproduction 'FMDC 2016' — relabel at deploy time if the coordinator finds the footer code is a serial rather than a date (37m precedent). Subject split: Biology Q1-30, Physics Q31-60, Chemistry Q61-90, English Q91-100. Mixed 4/5 options (59x4 + 41x5). 14 printed-key corrections; 3 PICK-ONE (Q4, Q15, Q17); 2 DEFECTIVE-excluded (Q36, Q96). Answers verified independently against reference facts, worked derivations and targeted sources, never from the printed key alone. Decisions by the assistant under the owner's 8 Nov 2026 delegation.

1 A student is trying to determine the type

A student is trying to determine the type of membrane transport occurring in a cell. She finds that the molecules to be transported is very large and when transported across the membrane, no ATP is used. Which of the following is the most likely mechanism of transport?

- A. Active transport
- B. Simple diffusion
- C. Facilitated diffusion
- D. Exocytosis ✓ **Correct answer**

A. wrong: active transport uses ATP, but no ATP is used here.

B. wrong: only small molecules cross the membrane by simple diffusion; the molecules here are very large.

C. wrong: carrier- and channel-mediated transport handles small molecules and ions, not very large molecules.

D. correct: very large molecules cross the membrane by bulk transport — exocytosis — in vesicles that fuse with the membrane, the only listed mechanism for very large molecules without direct ATP-driven pumping.

Question 2 In the course of glycolysis

In the course of glycolysis

- A. NADH is reduced to NAD+
- B. NAD+ is oxidized to NADH
- C. Glucose is degraded into two molecules ✓ **Correct answer**
- D. Both A & B

A. wrong: in glycolysis NAD+ is reduced (gains electrons) to NADH; NADH is oxidised back to NAD+ only later in respiration.

AD+ is reduced to NADH, not oxidised.

C. correct: one glucose molecule is split into two molecules of pyruvate.

D. wrong: both A and B misstate the redox direction.

Question 3 The epiglottis is to trachea as the lower

The epiglottis is to trachea as the lower esophageal (cardiac) sphinchter is to the:

- A. Stomach ✓ **Correct answer**
- B. Heart
- C. Small intestine
- D. Liver

A. correct: the lower esophageal (cardiac) sphincter guards the entrance to the stomach, just as the epiglottis guards the trachea.

B. wrong: the cardiac sphincter is named for its position near the heart, not for guarding it.

C. wrong: the small intestine is guarded by the pyloric sphincter.

D. wrong: no sphincter guards the liver.

Question 4 Starch is hydrolyzed into maltose by:

Starch is hydrolyzed into maltose by:

- A. Salivary amylase
- B. Maltase
- C. Pancreatic amylase ✓ **Correct answer**
- D. Both A & B

A. also correct: ptyalin in saliva hydrolyses starch to maltose (see the PICK-ONE note).

B. wrong: maltase hydrolyses maltose to glucose, not starch to maltose.

pancreatic amylase hydrolyses starch to maltose in the small intestine; the key records C, which is filed (A is also correct, see the PICK-ONE note).

D. wrong: B (maltase) does not hydrolyse starch, so the pair is not correct.

Question 5 Which of the following best describes the residual

Which of the following best describes the residual volume of the lungs?

- A. The amount of air normally inhaled and exhaled with each breath.
- B. The maximum amount of air that can be forcibly inhaled and exhaled from the lungs.
- C. The volume of air that can still be forcibly exhaled following a normal exhalation.
- D. The volume of air that always remains in the lungs. ✓ **Correct answer**

A. wrong: that is the tidal volume.

B. wrong: that is the vital capacity.

C. wrong: that is the expiratory reserve volume.

D. correct: the residual volume is the air that always remains in the lungs even after maximal exhalation.

Question 6 The diagram shows the sequence of events occurring

The diagram shows the sequence of events occurring as an action potential arrives at a synapse. The numbered arrows represent movement of substances across the membranes. What are the substances moving across the membranes? (Columns are arrows 1, 2, 3, 4, 5.)

- A. 1: K+, 2: Na+, 3: Acetylcholine, 4: Ca2+, 5: K+
- B. 1: K+, 2: Na+, 3: K+, 4: Ca2+, 5: Acetylcholine
- C. 1: Na+, 2: K+, 3: Ca2+, 4: Acetylcholine, 5: Na+
- D. 1: Na+, 2: K+, 3: Na+, 4: Acetylcholine, 5: Ca2+ ✓ **Correct answer**

arrow 1 is Na+ entering, not K+, and arrow 3 is Na+, not acetylcholine.

B. wrong: arrow 1 is Na+, not K+, and arrow 5 is Ca2+, not acetylcholine.

C. wrong: arrow 3 is Na+, not Ca2+, and arrow 5 is Ca2+, not Na+.

D. correct: Na+ enters as the action potential arrives, K+ leaves, Na+ enters the postsynaptic membrane, acetylcholine is released into the cleft, and Ca2+ enters the presynaptic terminal to trigger release.

Question 7 Arthropods can be characterized by all of the

Arthropods can be characterized by all of the following EXCEPT:

- A. A hard exoskeleton
- B. A water vascular system ✓ **Correct answer**
- C. Joined appendages
- D. Molting
- E. Segmented body

A. wrong: arthropods do have a hard exoskeleton, so this is a character of arthropods, not the exception.

B. correct: the water vascular system belongs to echinoderms, not arthropods, so it is the exception.

C. wrong: arthropods do have jointed (joined) appendages.

D. wrong: arthropods moult (ecdysis) as they grow.

E. wrong: arthropods do have segmented bodies.

Question 8 The role of decomposers in the nitrogen cycle

The role of decomposers in the nitrogen cycle is to:

- A. Fix atmospheric nitrogen into ammonia

- orporate nitrogen into amino acids acids and organic compounds
- C. Convert ammonia to nitrate, which can then be absorbed by plants
- D. Denitrify ammonia, thus returning nitrogen to the atmosphere
- E. Release ammonia from organic compounds, thus returning into the soil ✓ **Correct answer**

A. wrong: that is done by nitrogen-fixing bacteria, not decomposers.

B. wrong: that is assimilation by plants and other producers.

C. wrong: that is nitrification, done by nitrifying bacteria.

D. wrong: denitrification returns nitrogen gas to the atmosphere; decomposers do the opposite step.

E. correct: decomposers break down dead organic matter and release ammonia (ammonification) into the soil.

Question 9 When a haemophilic carrier woman marries a normal

When a haemophilic carrier woman marries a normal man, who among her offspring may be affected:

- A. All her children
- B. All her daughters
- C. Half of her daughters
- D. Half of her sons ✓ **Correct answer**
- E. All her sons

A. wrong: only half of her sons are affected; her daughters are not affected.

B. wrong: daughters receive a normal X from their father, so none is affected (they are carriers or normal).

C. wrong: no daughter is affected, since each gets a normal X chromosome from the

D. correct: a son receives his X from his mother, so half the sons get the haemophilia allele and are affected.

E. wrong: only the half who inherit the affected X chromosome are haemophilic.

Question 10 Perhaps the most fragile of all the biomes,

Perhaps the most fragile of all the biomes, because of its short growing season is:

- A. Tundra ✓ **Correct answer**
- B. Desert
- C. Grass land
- D. Temperature deciduous grass land
- E. Sometimes grass land but mostly tundra

A. correct: the tundra has a very short growing season and is the most fragile biome.

B. wrong: deserts are fragile but are not defined by a short growing season.

C. wrong: grasslands have a longer growing season and recover more readily.

D. wrong: temperate grasslands are not the most fragile biome.

E. wrong: the answer is simply the tundra.

Question 11 In floral formula K stands for:

In floral formula "K" stands for:

- A. Corolla
- B. Calyx ✓ **Correct answer**
- C. Perianth
- D. Androecium
- E. Gynoecium

rolla is C in the floral formula.

B. correct: K stands for calyx (from the German Kelch).

C. wrong: perianth is P.

D. wrong: androecium is A.

E. wrong: gynoecium is G.

Question 12 Hordeum vulgare is the botanical name of:

"Hordeum vulgare" is the botanical name of:

- A. Wheat
- B. Oats
- C. Rice
- D. Barley ✓ **Correct answer**
- E. Bajra

A. wrong: wheat is Triticum aestivum.

B. wrong: oats is Avena sativa.

C. wrong: rice is Oryza sativa.

D. correct: Hordeum vulgare is barley.

E. wrong: bajra (pearl millet) is Pennisetum glaucum.

Question 13 The usual duration of luteal phase in the

The usual duration of luteal phase in the menstrual cycle of human female is:

- A. 4-6 days
- B. 8-10 days
- C. 12-14 days ✓ **Correct answer**

12 days

A. wrong: 4–6 days is the length of the menstrual flow, not the luteal phase.

B. wrong: the luteal phase is longer than this.

C. correct: the luteal phase (from ovulation to menstruation) lasts about 12–14 days.

D. wrong: the luteal phase is about 12–14 days.

Question 14 Response to plants to touch is called:

Response to plants to touch is called:

- A. Geotropism
- B. Thigmotropism ✓ **Correct answer**
- C. Nasticism
- D. Mechanoreception

A. wrong: geotropism is the response to gravity.

B. correct: thigmotropism is the growth response of plants to touch.

C. wrong: nastic movements are non-directional responses to a stimulus.

D. wrong: mechanoreception is the sensing of mechanical stimuli, not the growth response itself.

Question 15 Select the false statement:

Select the false statement:

- A. All fungi are saprophytic ✓ **Correct answer**
- B. Mycology is the study of fungi
- C. Fungi are non coenocytic
- D. Puccinia is a obligate parasite

the keyed answer). Many fungi are parasitic or symbiotic, not saprophytic (see the PICK-ONE note — C is also false).

B. true: mycology is the branch of biology dealing with fungi.

C. also false: zygomycetes such as Rhizopus are coenocytic (aseptate), so the blanket statement is false (see the PICK-ONE note).

D. true: Puccinia (wheat rust) is an obligate parasite.

Question 16 Photosynthetic product from leaves to all parts of

Photosynthetic product from leaves to all parts of plant are disturbed through:

- A. Vascular bundles
- B. Phloem ✓ **Correct answer**
- C. Xylem
- D. Stomata
- E. None of the above

A. wrong: a vascular bundle contains both xylem and phloem; the tissue that carries photosynthetic products is the phloem specifically.

B. correct: photosynthetic products (food) are translocated from leaves to all parts of the plant through the phloem.

C. wrong: xylem carries water and mineral salts upward from the roots.

D. wrong: stomata are pores for gas exchange, not transport tissue.

E. wrong: the phloem is the correct answer.

Question 17 In the F2 generation of a dihybrid cross

In the F2 generation of a dihybrid cross between yellow, round seeded and green, wrinkled seeded pea plants, 17 out of 254 seeds were green and wrinkled; other seeds

w and round, Green and round, Yellow and wrinkled. What do these results indicate?

- A. Crossing-over has occurred ✓ **Correct answer**
- B. Green and wrinkled are both recessive characters
- C. The alleles for green and wrinkled are linked
- D. The allele foe green is recessive but not the allele for wrinkled
- E. The allele for wrinkled is recessive but not the allele for green

A. correct (the keyed answer): the recombinant phenotypes in the F2 show that crossing-over occurred during meiosis in the F1 (see the PICK-ONE note — B is also correct).

B. also correct: the F1 was all yellow and round, so green and wrinkled are the recessive characters (see the PICK-ONE note).

C. wrong: 17 out of 254 is about 1/16, the frequency expected for independent assortment, not linkage.

D. wrong: both green and wrinkled are recessive.

E. wrong: both green and wrinkled are recessive.

Question 18 Duck bill playtypus and spiny and eater have

Duck bill playtypus and spiny and eater have internal fertilization and are:

- A. Ovoviviparous
- B. Viviparous
- C. Oviparous ✓ **Correct answer**
- D. None of the above

A. wrong: ovoviviparous animals retain eggs inside the body until they hatch; the platypus and spiny anteater lay eggs.

B. wrong: viviparous animals give birth to live young; monotremes do not.

e duck-billed platypus and the spiny anteater (echidna) are monotremes that lay eggs, with internal fertilisation.

D. wrong: oviparous is the correct description.

Question 19 Nematocysts are characteristics of:

Nematocysts are characteristics of:

- A. Porifera
- B. Protozoa
- C. Cnidarians ✓ **Correct answer**
- D. Annelida
- E. Echinodermata

A. wrong: sponges do not have nematocysts.

B. wrong: protozoans do not have nematocysts.

C. correct: nematocysts (stinging cells) are the characteristic of cnidarians.

D. wrong: annelids do not have nematocysts.

E. wrong: echinoderms do not have nematocysts.

Question 20 Which of the following is an acceptable nitrogen

Which of the following is an acceptable nitrogen base composition for double stranded DNA?

- A. 31% A; 19% T; 31% C; 19% G
- B. 36% A; 36% U; 24% C; 24% G
- C. 48% A; 48% T; 52% C; 52% G
- D. 31% A; 31% T; 19% C; 19% G ✓ **Correct answer**
- E. 24% A; 24% U; 36% C; 19% G

double-stranded DNA A must equal T, but here A is 31% and T is 19%.

B. wrong: DNA contains thymine, not uracil (U is in RNA).

C. wrong: the percentages add to 200%, not 100%.

D. correct: A equals T (31% each) and C equals G (19% each), totalling 100%, as Chargaff's rules require.

E. wrong: DNA contains no uracil, and C does not equal G here.

Question 21 The correct order of the structures through which

The correct order of the structures through which air passes is I. Nasal cavity II. Bronchi III. Larynx IV. Air sacs V. Trachea

- A. I, V, III, II, IV
- B. I, V, III, IV, II
- C. I, III, IV, V, II
- D. I, III, V, IV, II
- E. I, III, V, II, IV ✓ **Correct answer**

A. wrong: the trachea (V) comes after the larynx (III), not before it.

B. wrong: the trachea comes after the larynx, and the air sacs (IV) come after the bronchi (II).

C. wrong: the air sacs come last, after the bronchi.

D. wrong: the bronchi (II) come before the air sacs (IV).

E. correct: nasal cavity, larynx, trachea, bronchi, air sacs (alveoli).

Question 22 Which of the following pathways outlines the order

Which of the following pathways outlines the order of events during aerobic cellular

Trace from first to last.

- A. Glucose triose phosphate Pyruvate Kreb cycle CO2 + H2O +ATP ✓ **Correct answer**
- B. Glucose triose phosphate Pyruvate Kerbs cycle CO2 + H2O +ADP + Pi
- C. Glucose hexose phosphate Pyruvate Kerbs cycle CO2 + H2O +ADP + Pi
- D. Glucose hexose phosphate Pyruvate Kerbs cycle Ethanol CO2 + ATP

A. correct: glucose is split to triose phosphate, then pyruvate, which enters the Krebs cycle, yielding carbon dioxide, water and ATP.

B. wrong: ADP and Pi are the raw materials for ATP synthesis, not the products of respiration.

C. wrong: it ends with ADP + Pi instead of ATP.

D. wrong: aerobic respiration does not produce ethanol; ethanol is a product of anaerobic fermentation.

Question 23 The diameter of a tree is reduced slightly

The diameter of a tree is reduced slightly during the day and increased at night. Which of the following changes in environment condition cause the greatest reduction in diameter?

- A. Increase in wind velocity, temperature, humidity and light intensity
- B. Increases in temperature, humidity and light intensity
- C. Increases in wind velocity, humidity and light intensity
- D. Increases in wind velocity, temperature and light intensity ✓ **Correct answer**
- E. Increases is wind velocity temperature and humidity

A. wrong: an increase in humidity reduces transpiration, so this combination does not give the greatest reduction in diameter.

B. wrong: the humidity increase reduces transpiration, and there is no wind increase.

e humidity increase reduces transpiration.

D. correct: wind, temperature and light all increase transpiration while humidity does not rise, giving the greatest daytime water loss and the greatest reduction in diameter.

E. wrong: the humidity increase reduces transpiration.

Question 24 Why is there no glucose present in filtrate

Why is there no glucose present in filtrate the distal of a nephron?

- A. Glucose molecules are too large to pass cross the basement membrane
- B. Glucose removed by osmosis from the tubule
- C. Glucose is passively absorbed by the cells lining the descending loop of Henle.
- D. Glucose is actively absorbed by the proximal tubule cells. ✓ **Correct answer**

A. wrong: glucose molecules are small and are freely filtered into the nephron.

B. wrong: glucose is not removed by osmosis.

C. wrong: glucose is not absorbed in the descending loop of Henle.

D. correct: all the filtered glucose is actively reabsorbed (co-transported with sodium) by the proximal tubule cells, so none reaches the distal tubule.

Question 25 Which of the following is the stage of

Which of the following is the stage of meiosis during which pairs of homologous chromosomes align at the center of the cell?

- A. Anaphase II
- B. Metaphase I ✓ **Correct answer**
- C. Prophase II
- D. Anaphase I
- E. Prophase I

anaphase II the sister chromatids separate.

B. correct: in metaphase I the pairs of homologous chromosomes align at the centre (equator) of the cell.

C. wrong: in prophase II the chromosomes condense again; no alignment of homologous pairs occurs.

D. wrong: in anaphase I the homologous chromosomes separate to opposite poles.

E. wrong: in prophase I the homologous chromosomes pair and cross over; they do not yet align at the centre.

Question 26 The tricuspid valve prevent backflow of blood from

The tricuspid valve prevent backflow of blood from the:

- A. Left ventricle into the left atrium
- B. Aorta into the left ventricle
- C. Pulmonary artery into the right ventricle
- D. Right ventricle into the right atrium ✓ **Correct answer**

A. wrong: that backflow is prevented by the mitral (bicuspid) valve.

B. wrong: that backflow is prevented by the aortic (semilunar) valve.

C. wrong: that backflow is prevented by the pulmonary (semilunar) valve.

D. correct: the tricuspid valve, between the right atrium and right ventricle, prevents blood flowing back from the ventricle into the atrium.

Question 27 The liver:

The liver:

- A. Decreases blood glucose levels
- B. Increase blood glucose levels

- D. All of the above are function of the liver ✓ **Correct answer**

A. true: the liver lowers blood glucose by glycogenesis (storing glucose as glycogen), but it is not the only liver function listed.

B. true: the liver raises blood glucose by glycogenolysis and gluconeogenesis, but it is not the only liver function listed.

C. true: the liver synthesises glucose by gluconeogenesis, but it is not the only liver function listed.

D. correct: the liver does all three, so D is the complete answer.

Question 28 At which two points of the menstrual cycle

At which two points of the menstrual cycle are the level estrogen heights?

- A. Immediately before and after ovulation ✓ **Correct answer**
- B. At ovulation and during the menstrual flow
- C. During the menstrual flow and pregnancy
- D. Pregnancy and after menopause

A. correct: estrogen levels are highest just before ovulation (with a second, lower peak in the mid-luteal phase after ovulation).

B. wrong: estrogen is low during the menstrual flow.

C. wrong: estrogen is low during the menstrual flow, even though it is high in pregnancy.

D. wrong: estrogen is very low after menopause.

Question 29 Herpes is a virus that enters the human

Herpes is a virus that enters the human body and remains dormant in the nervous system until is produces an outbreak, without any particular reason. Which of the

atements correctly describes herpes?

- A. While it remains dormant in the nervous system, the virus in its lysogenic cycle
- B. During an outbreak the virus is in the lytic cycle
- C. Herpes integrates itself into the DNA of the cell
- D. All of the above ✓ **Correct answer**

A. true: in latency the herpes virus persists in nerve cells in a lysogenic-like (dormant) state.

B. true: during an outbreak the virus replicates actively (lytic cycle).

C. true: in latency the viral genome persists within the host cell nucleus.

D. correct: all three statements describe herpes correctly.

Question 30 Which of the following statements could not be

Which of the following statements could not be used to describe a species?

- A. A group of organism showing distinctly similar autosomes ✓ **Correct answer**
- B. A group of organism showing analogues body structures
- C. A group of organism capable of mating to produce viable offspring
- D. A group of organisms sharing the same ecological niche
- E. A group of organisms sharing unique structural and functional characteristics

A. correct: similarity of autosomes is not a criterion for a species, so this statement could not be used to describe one.

B. wrong: members of a species share similar body structures (the morphological criterion), so this can describe a species.

C. wrong: interbreeding to produce viable offspring is the biological species concept, so this can describe a species.

D. wrong: a species occupies a niche, so this can describe a species.

ared unique structure and function can describe a species.

Question 31 A frictionless heat engine can be 100% efficient

A frictionless heat engine can be 100% efficient only its exhaust temperatures is:

- A. Double of its input temperature
- B. Half of its input temperature
- C. Equal of its input temperature
- D. 100%
- E. 0 K ✓ **Correct answer**

A. wrong: a 100% efficient engine needs its exhaust at absolute zero, not at double the input temperature.

B. wrong: with the exhaust at half the input temperature the efficiency is only 50%.

C. wrong: with the exhaust equal to the input temperature the efficiency is zero.

D. wrong: 100% is not a temperature.

E. correct: efficiency = 1 − Tc/Th, so 100% efficiency needs the exhaust temperature Tc = 0 K (absolute zero).

Question 32 The vector which only specifies the direction of

The vector which only specifies the direction of a given vector is called:

- A. Free vector
- B. Position vector
- C. Null vector
- D. Unit vector ✓ **Correct answer**

A. wrong: a free vector can be shifted parallel to itself and specifies both magnitude and direction.

position vector specifies the position of a point, not only a direction.

C. wrong: a null vector has zero magnitude and no direction.

D. correct: a unit vector has magnitude 1 and specifies only the direction of a given vector.

Question 33 A ball is thrown vertically upward with velocity

A ball is thrown vertically upward with velocity of 196 m/s. how high does the ball rise?

- A. 1960 meters ✓ **Correct answer**
- B. 2960 meters
- C. 1000 meters
- D. 1100 meters

A. correct: h = v^2/2g = 196^2/(2 x 9.8) = 38416/19.6 = 1960 m.

B. wrong: the ball rises 1960 m, not 2960 m.

C. wrong: the ball rises 1960 m, not 1000 m.

D. wrong: the ball rises 1960 m, not 1100 m.

Question 34 ''If there is no external force applied to

''If there is no external force applied to a system, then the total momentum of that systems remains constant". This known as:

- A. Law of conversation of mass
- B. Elastic collision
- C. Law of conversation of momentum ✓ **Correct answer**
- D. Momentum of body

A. wrong: the statement is about momentum, not mass (and the print misspells conservation as conversation).

B. wrong: an elastic collision is a type of collision, not the name of this law.

ith no external force, the total momentum of a system remains constant — the law of conservation of momentum.

D. wrong: momentum of a body is a quantity, not the name of this law.

Question 35 A car traveling at a constant speed of

A car traveling at a constant speed of 90 km/h rounds a curve of a radius 100m. what is its acceleration?

- A. 4.0 m/sec^2
- B. 6.25 m/sec^2 ✓ **Correct answer**
- C. 6.5 m/sec^2
- D. 4.5 m/sec^2
- E. 7.5 m/sec^2

A. wrong: the centripetal acceleration is v^2/r = 6.25 m/s^2, not 4.0.

B. correct: v = 90 km/h = 25 m/s, so a = v^2/r = 25^2/100 = 6.25 m/s^2.

C. wrong: the acceleration is 6.25 m/s^2, not 6.5.

D. wrong: the acceleration is 6.25 m/s^2, not 4.5.

E. wrong: the acceleration is 6.25 m/s^2, not 7.5.

Question 36 An elevator weighing 3.5 x 10^6 N is

An elevator weighing 3.5 x 10^6 N is raised to a height of 1000m in the absence of friction, the work done is:

- A. 38.2J
- B. 392.1J
- C. 39.2J
- D. 40.3J
- E. 40J

s given for this question, and none is taught. DEFECTIVE — EXCLUDED, no answer asserted (printed key C "39.2J"; Work = F x d = 3.5 x 10^6 N x 1000 m = 3.5 x 10^9 J. No option is near this (38.2 J / 392.1 J / 39.2 J / 40.3 J / 40 J); the options belong to a different question. No correct option is offered. Decided by the assistant under the owner's 8 Nov 2026 delegation)

A. wrong: the work done is F x d = 3.5 x 10^6 N x 1000 m = 3.5 x 10^9 J, not 38.2 J.

B. wrong: the work done is 3.5 x 10^9 J, not 392.1 J.

C. wrong: this is the keyed answer, but the work done is 3.5 x 10^9 J, not 39.2 J.

D. wrong: the work done is 3.5 x 10^9 J, not 40.3 J.

E. wrong: the work done is 3.5 x 10^9 J, not 40 J. No correct option is offered, so this question is DEFECTIVE-excluded.

Question 37 An elevator, in which a man is standing

An elevator, in which a man is standing is moving upward with a constant speed of 10 m/s. If the man drops a coin from a height of 2.5 m, find the time taken by it to reach the floor of the elevation (g = 9.8 m/s^2)

- A. 0.707 s ✓ **Correct answer**
- B. 1.9 s
- C. 3.1 s
- D. 6.17 s
- E. 7.15 s

A. correct: the elevator moves at constant speed, so it is an inertial frame and the coin falls 2.5 m under gravity alone: t = sqrt(2h/g) = sqrt(5/10) = 0.707 s (using g = 10 m/s^2).

B. wrong: the fall takes about 0.707 s, not 1.9 s.

C. wrong: the fall takes about 0.707 s, not 3.1 s.

e fall takes about 0.707 s, not 6.17 s.

E. wrong: the fall takes about 0.707 s, not 7.15 s.

Question 38 A 100 kg man runs up a hill

A 100 kg man runs up a hill through a height of 4m. How much work does he do against gravitational force?

- A. 2060 J
- B. 3920 J ✓ **Correct answer**
- C. 400 J
- D. 5290 J

A. wrong: the work done is mgh = 100 x 9.8 x 4 = 3920 J, not 2060 J.

B. correct: work against gravity is mgh = 100 kg x 9.8 m/s^2 x 4 m = 3920 J.

C. wrong: this is the printed key, but 100 x 9.8 x 4 = 3920 J, not 400 J.

D. wrong: the work done is 3920 J, not 5290 J.

Question 39 Which one of the following statements is correct?

Which one of the following statements is correct?

- A. Capacitance sometimes decreases in parallel combination
- B. Capacitance increases in series combination
- C. Capacitance is the same in both combinations
- D. Capacitance decreases in parallel combination
- E. None of the above ✓ **Correct answer**

A. wrong: in parallel the capacitances add (Ceq = C1 + C2), so the equivalent capacitance increases, never decreases.

B. wrong: in series 1/Ceq = 1/C1 + 1/C2, so the equivalent capacitance decreases.

e equivalent capacitance is larger in parallel and smaller in series.

D. wrong: this is the printed key, but in parallel the capacitances add, so the equivalent increases.

E. correct: all four statements A–D are false, so none of the above is the right answer.

Question 40 Find the time period of a simple pendulum

Find the time period of a simple pendulum whose length is 88.2 cm. The value acceleration due to gravity is 9.8 m/s^2 at the place where experiments is performed?

- A. 1.885 sec ✓ **Correct answer**
- B. 1.233 sec
- C. 2.05 sec
- D. 4 sec

A. correct: T = 2pi sqrt(l/g) = 2pi sqrt(0.882/9.8) = 2pi x 0.3 = 1.885 s.

B. wrong: the period is 1.885 s, not 1.233 s.

C. wrong: the period is 1.885 s, not 2.05 s.

D. wrong: the period is 1.885 s, not 4 s.

Question 41 A light bulb has resistance of 150, find

A light bulb has resistance of 150, find the voltage while the current is 1.5A?

- A. 250 v
- B. 300 v
- C. 224 v
- D. 225 v ✓ **Correct answer**

A. wrong: V = IR = 1.5 x 150 = 225 V, not 250 V.

B. wrong: V = 225 V, not 300 V.

= 225 V, not 224 V.

D. correct: V = IR = 1.5 A x 150 ohm = 225 V.

Question 42 An object that's moving with constant speed travels

An object that's moving with constant speed travels around a circular path. Which of the following is/are true concerning this motion? I. The displacement is zero II. The average speed is zero III. The circulation is zero

- A. I only ✓ **Correct answer**
- B. I, III and II
- C. I and III only
- D. III only
- E. II and III only

A. correct: after one full circle the object is back where it started, so the displacement is zero (I); the average speed is distance over time, which is not zero (II is false), and the circulation is not zero (III is false).

B. wrong: II and III are false.

C. wrong: III is false.

D. wrong: III is false and I is true.

E. wrong: both II and III are false.

Question 43 A system absorbed 80 J through heating while

A system absorbed 80 J through heating while dong 100 J of external work, what is the change in the internal energy of the system?

- A. -100 J
- B. -20 J ✓ **Correct answer**
- C. +80 J

0 J

A. wrong: the change in internal energy is Q − W = 80 − 100 = −20 J, not −100 J.

B. correct: by the first law, delta-U = Q − W = 80 J − 100 J = −20 J.

C. wrong: the work done by the system must be subtracted; delta-U is −20 J.

D. wrong: the change is 80 − 100 = −20 J, not +180 J.

Question 44 A region around a charge body in which

A region around a charge body in which another charge experiences an electric force is called:

- A. Electric flux
- B. Electric field ✓ **Correct answer**
- C. Electric potential
- D. Capacitance

A. wrong: electric flux is the number of field lines passing through a surface, not the region itself.

B. correct: the electric field is the region around a charged body in which another charge experiences an electric force.

C. wrong: electric potential is the work done per unit charge, not the region.

D. wrong: capacitance is the ability of a body to store charge.

Question 45 The Dioptre power of concave lens of 10cm

The Dioptre power of concave lens of 10cm focal length is:

- A. 10 Dioptre
- B. -10 Dioptre ✓ **Correct answer**
- C. 1/10 Dioptre

0 Dioptre

- E. -7 Dioptre

A. wrong: the power is negative for a concave lens, and 1/0.1 = 10 with the sign gives −10 D.

B. correct: for a concave lens f = −10 cm = −0.1 m, so P = 1/f = −10 dioptres.

C. wrong: the power is −10 D, not 1/10 D.

D. wrong: the power is −10 D, not −1/10 D.

E. wrong: the power is −10 D, not −7 D.

Question 46 A simple pendulum suspended from the ceiling of

A simple pendulum suspended from the ceiling of a train has a period 'T' when the train is a rest. When the train is accelerating with a uniform acceleration, the time period of simple pendulum will:

- A. Decrease ✓ **Correct answer**
- B. Increase
- C. Remain unchanged
- D. Become infinite
- E. Insufficient information

A. correct: in an accelerating train the effective gravity is larger (g_eff = sqrt(g^2 + a^2)), so the period T = 2pi sqrt(l/g_eff) decreases.

B. wrong: the period decreases, because the effective gravity increases.

C. wrong: this is the printed key, but the effective gravity increases, so the period decreases.

D. wrong: the period decreases slightly, it does not become infinite.

e period must decrease whenever the train accelerates.

Question 47 Lenz's law states that:

Lenz's law states that:

- A. The flow of a fluid in a medium under same applied force experiences some sort of friction or resistance in its path
- B. A body remains at rest of continuous to move with uniform velocity unless acted upon by an unbalanced force
- C. The induced current always flows in such a direction as to oppose the change which is giving rise to it ✓ **Correct answer**
- D. When a particle bearing a charge q and moving with a velocity V enters the region of a uniform magnetic field of induction B, it is acted upon by a force

A. wrong: that describes viscosity/resistance, not Lenz's law.

B. wrong: that is Newton's first law of motion.

C. correct: that is Lenz's law.

D. wrong: that describes the Lorentz force on a moving charge, not Lenz's law.

Question 48 A force of 50N acts on a body

A force of 50N acts on a body for 10 seconds. What will be the change in momentum

- A. 200N/s
- B. 500N/s ✓ **Correct answer**
- C. 800N/s
- D. 5N/s
- E. 50N/s

A. wrong: the change in momentum is F x t = 50 x 10 = 500, not 200.

B. correct: impulse = F x t = 50 N x 10 s = 500 N·s (the paper prints the unit as N/s).

e change in momentum is 500, not 800.

D. wrong: the change in momentum is 500, not 5.

E. wrong: the change in momentum is 500, not 50.

Question 49 Two capacitors C = 2 μF are connected

Two capacitors C = 2 μF are connected in series. Find the effective capacitance.

- A. 1μF ✓ **Correct answer**
- B. 3μF
- C. 4μF
- D. 7μF
- E. 9/2μF

A. correct: in series 1/C = 1/2 + 1/2 = 1, so the effective capacitance is 1 μF.

B. wrong: the effective capacitance is 1 μF, not 3 μF.

C. wrong: the effective capacitance is 1 μF, not 4 μF.

D. wrong: the effective capacitance is 1 μF, not 7 μF.

E. wrong: the effective capacitance is 1 μF, not 9/2 μF.

Question 50 Consider two equal resistors wired in parallel. What

Consider two equal resistors wired in parallel. What is the equivalent resistance of the two?

- A. 3R/2
- B. R/2 ✓ **Correct answer**
- C. R/3
- D. R/5
- E. R/7

e equivalent resistance of two equal resistors in parallel is R/2, not 3R/2.

B. correct: in parallel 1/Req = 1/R + 1/R = 2/R, so Req = R/2.

C. wrong: the equivalent resistance is R/2, not R/3.

D. wrong: the equivalent resistance is R/2, not R/5.

E. wrong: the equivalent resistance is R/2, not R/7.

Question 51 A detector with a surface area of 1

A detector with a surface area of 1 square meter is placed 1 meter from an operating jackhammer. It measures the power of jackhammer's sounds as being 10^-3 W; find the intensity of the jackhammer.

- A. 10 W/m
- B. 10^-3 W/m^2 ✓ **Correct answer**
- C. 10^-9 W/m^2
- D. 10^-7 W/m^2
- E. 10^-9 W/m^2

A. wrong: intensity is power per unit area, and 10^-3 W over 1 m^2 is 10^-3 W/m^2, not 10 W/m.

B. correct: intensity I = P/A = 10^-3 W / 1 m^2 = 10^-3 W/m^2.

C. wrong: the intensity is 10^-3 W/m^2, not 10^-9.

D. wrong: the intensity is 10^-3 W/m^2, not 10^-7.

E. wrong: the intensity is 10^-3 W/m^2, not 10^-9 (this option duplicates C).

Question 52 Ultra violet light is more likely to cause

Ultra violet light is more likely to cause a photoelectric effect than a visible light. This is

otons of ultraviolet light ?

- A. Have a longer wavelength
- B. Have a higher velocity
- C. Are not visible
- D. Have a higher energy ✓ **Correct answer**

A. wrong: ultraviolet light has a shorter wavelength than visible light.

B. wrong: all light travels at the same speed in a vacuum.

C. wrong: invisibility does not cause the photoelectric effect.

D. correct: ultraviolet photons have a higher frequency, so E = hf is larger and more likely to exceed the work function.

Question 53 If an object is released 19.6 meter above

If an object is released 19.6 meter above the ground, how long does it take the object to reach the ground? (g = 9.8 m/s^2)

- A. 1 seconds
- B. 2 seconds ✓ **Correct answer**
- C. 6 seconds
- D. 8 seconds
- E. 10 seconds

A. wrong: the fall takes 2 s, not 1 s.

B. correct: t = sqrt(2h/g) = sqrt(2 x 19.6/9.8) = sqrt(4) = 2 s.

C. wrong: the fall takes 2 s, not 6 s.

D. wrong: the fall takes 2 s, not 8 s.

E. wrong: the fall takes 2 s, not 10 s.

54 Two tuning forks are sounded one has a

Two tuning forks are sounded one has a frequency of 250 Hz while the other has a frequency of 245 Hz. What is the frequency of the beats?

- A. 250 Hz
- B. 245 Hz
- C. 5 Hz ✓ **Correct answer**
- D. 10 Hz
- E. 235 Hz

A. wrong: the beat frequency is the difference of the two frequencies, not one of them.

B. wrong: the beat frequency is the difference, 5 Hz, not 245 Hz.

C. correct: the beat frequency is $|250 - 245| = 5$ Hz.

D. wrong: the beat frequency is 5 Hz, not 10 Hz.

E. wrong: the beat frequency is 5 Hz, not 235 Hz.

Question 55 A rock is dropped from a high bridge

A rock is dropped from a high bridge at the end of 3 seconds of free fall the speed of the rock in cm/s:

- A. 30
- B. 100
- C. 500
- D. 1000
- E. 2940 ✓ **Correct answer**

A. wrong: after 3 s the speed is 2940 cm/s, not 30 cm/s.

B. wrong: the speed is 2940 cm/s, not 100 cm/s.

C. wrong: the speed is 2940 cm/s, not 500 cm/s.

e speed is 2940 cm/s, not 1000 cm/s.

E. correct: v = gt = 9.8 x 3 = 29.4 m/s = 2940 cm/s.

Question 56 A body rolling freely on the surface of

A body rolling freely on the surface of the earth eventually comes to rest because

- A. It has mass
- B. It suffers friction ✓ **Correct answer**
- C. It has inertia of rest
- D. It has a momentum
- E. It is gravitation less because it is already on the surface.

A. wrong: having mass does not stop a rolling body.

B. correct: friction (rolling resistance) opposes the motion and eventually brings the body to rest.

C. wrong: inertia of rest resists a change from rest to motion, it does not stop a moving body.

D. wrong: momentum keeps it moving; it does not stop it.

E. wrong: gravity still acts on a body on the surface.

Question 57 A body of mass 2 kg is suspended

A body of mass 2 kg is suspended in an elevator by means of a spring balance. The balance reads its weight when the elevator moves up with an acceleration of 5ms-2 as

- A. 30.5N
- B. 29.6N ✓ **Correct answer**
- C. 26.5N
- D. 9.8N
- E. 30.9N

e apparent weight is 2 x (9.8 + 5) = 29.6 N, not 30.5 N.

B. correct: moving up with acceleration a, the balance reads m(g + a) = 2 x (9.8 + 5) = 29.6 N.

C. wrong: the apparent weight is 29.6 N, not 26.5 N.

D. wrong: the apparent weight is 29.6 N, not 9.8 N.

E. wrong: the apparent weight is 29.6 N, not 30.9 N.

Question 58 The kinetic energy of a projectile at the

The kinetic energy of a projectile at the highest point is half of its kinetic energy. The angle of projection is

- A. 0°
- B. 30°
- C. 60°
- D. 45° ✓ **Correct answer**
- E. 90°

A. wrong: at 0° the kinetic energy at the top equals the initial kinetic energy.

B. wrong: at 30° the top kinetic energy is 3/4 of the initial, not 1/2.

C. wrong: at 60° the top kinetic energy is 1/4 of the initial, not 1/2.

D. correct: at the top only the horizontal component remains, so KE_top = KE x cos^2(theta); cos^2(theta) = 1/2 gives theta = 45°.

E. wrong: at 90° the kinetic energy at the top is zero.

Question 59 A small and a large rain drops are

A small and a large rain drops are falling through air

small drop will evaporate

- B. The large drop moves faster ✓ **Correct answer**
- C. The small drop moves faster
- D. Both move with the same speed
- E. No conclusion can be drawn unless the exact sizes of the drops are known

A. wrong: evaporation is not the reason for the difference in falling speed.

B. correct: larger drops have a higher terminal velocity, so the large drop falls faster.

C. wrong: the small drop has a lower terminal velocity and falls more slowly.

D. wrong: terminal velocity depends on size, so the speeds differ.

E. wrong: the general rule is enough — the larger drop falls faster.

Question 60 A container is divided into two equal portions.

A container is divided into two equal portions. One portion contains an ideal gas at pressure P and temperature T while the other portion is a perfect vacuum. If a hole is opened between the two portions

- A. There will be a change in internal energy
- B. There will be a change in temperature
- C. There will be no change in internal energy ✓ **Correct answer**
- D. The external pressure will increase
- E. The external pressure will decrease

A. wrong: this is the printed key, but a free expansion involves no heat and no work, so the internal energy does not change.

B. wrong: for an ideal gas the internal energy depends only on temperature, and since delta-U = 0 the temperature does not change.

C. correct: the gas expands into a vacuum, so q = 0 and w = 0, and delta-U = q + w = 0.

e external pressure is the vacuum (zero) and does not change.

E. wrong: the external pressure is the vacuum (zero) and does not change.

Question 61 Which gaseous hydride most readily decomposes into its

Which gaseous hydride most readily decomposes into its elements on contact with a hot glass rod?

- A. Ammonia
- B. Hydrogen chloride
- C. Hydrogen iodide ✓ **Correct answer**
- D. Steam

A. wrong: ammonia is comparatively stable and does not decompose readily on a hot glass rod.

B. wrong: HCl has a strong H–Cl bond and does not decompose readily.

C. correct: HI has the weakest H–X bond of the hydrogen halides and decomposes most readily into H2 and I2.

D. wrong: steam (water) is very stable and does not decompose on a hot glass rod.

Question 62 A hydrocarbon, which is a liquid at a

A hydrocarbon, which is a liquid at a room temperature, decolourises aqueous bromine. What could be the molecular formula of the compound?

- A. C2H2
- B. C2H4
- C. C7H16
- D. C10H20 ✓ **Correct answer**
- E. C12H26

nyne is a gas at room temperature, not a liquid.

B. wrong: ethene is a gas at room temperature, not a liquid.

C. wrong: heptane is an alkane, which does not decolourise bromine water.

D. correct: C10H20 is an alkene (CnH2n), a liquid at room temperature, and its double bond decolourises aqueous bromine.

E. wrong: dodecane is an alkane, which does not decolourise bromine water.

Question 63 Bleaching powder is a good:

Bleaching powder is a good:

- A. Hydrating agent
- B. Oxidizing agent ✓ **Correct answer**
- C. Dehydrating agent
- D. Reducing agent

A. wrong: bleaching powder is not used to add water.

B. correct: bleaching powder (calcium hypochlorite) is a strong oxidising agent, which is why it bleaches.

C. wrong: bleaching powder is not a dehydrating agent.

D. wrong: bleaching powder oxidises, it does not reduce.

Question 64 The value of the enthalpy change for the

The value of the enthalpy change for the process represented by the equation Na(s) → Na+(g) + e- is equal to :

- A. The first ionization energy of sodium
- B. The enthalpy change of vaporization of sodium
- C. The sum of the enthalpy change of the atomization and the first ionization energy

ium ✓ Correct answer

- D. The sum of the enthalpy change of atomization and the electron affinity of Sodium

A. wrong: the first ionisation energy alone covers only Na(g) to Na+(g); the sodium must first be atomised from the solid.

B. wrong: vaporisation (atomisation) is only the first step, not the whole process.

C. correct: Na(s) to Na(g) is atomisation, then Na(g) to Na+(g) + e- is the first ionisation energy.

D. wrong: electron affinity concerns gaining an electron, but an electron is lost here.

Question 65 Which statement about one mole of metal is

Which statement about one mole of metal is always correct?

- A. It contains the same number of atoms as 1 mole of hydrogen atoms. ✓ **Correct answer**
- B. It contains the same number of atoms as 1/12 mole of 12 C.
- C. It has the same mass as 1 mole of carbon atoms
- D. It is liberated by 1 mole electrons

A. correct: one mole of any substance contains Avogadro's number of particles, so one mole of a metal has the same number of atoms as one mole of hydrogen atoms.

B. wrong: 1/12 mole of carbon-12 contains only NA/12 atoms.

C. wrong: the mass of one mole depends on the atomic mass, which differs from metal to metal.

D. wrong: one mole of a metal is not liberated by one mole of electrons in general.

66 As the atomic number increases in a group,

As the atomic number increases in a group, the chemical properties:

- A. Change
- B. Stay roughly the same ✓ **Correct answer**
- C. Decrease
- D. Increase

A. wrong: this is the printed key, but elements in a group have similar chemical properties because they have the same valence-shell configuration.

B. correct: going down a group the chemical properties stay roughly the same (only the reactivity changes gradually).

C. wrong: the chemical properties do not systematically decrease down a group.

D. wrong: the chemical properties do not systematically increase down a group.

Question 67 The crystals formed as a result of Van

The crystals formed as a result of Van der waals interactions are:

- A. Molecular crystals ✓ **Correct answer**
- B. Covalent crystals
- C. Metallic crystals
- D. Ionic crystals

A. correct: molecular crystals are held together by weak Van der Waals forces between molecules.

B. wrong: covalent crystals are held by strong covalent bonds, not Van der Waals forces.

C. wrong: metallic crystals are held by metallic bonding.

D. wrong: ionic crystals are held by electrostatic attraction between ions.

68 All the following are the true statement concerning

All the following are the true statement concerning catalyst EXCEPT:

- A. A catalyst will speed up the rate determining step.
- B. A catalyst will be used up in a reaction ✓ **Correct answer**
- C. A catalyst may induce steric strain in a molecule to make it react more readily
- D. A catalyst will lower the activation energy of reaction

A. true: a catalyst lowers the activation energy of the slow step, so this is a true statement.

B. correct (the exception): a catalyst is not used up in a reaction; it is regenerated unchanged.

C. true: a catalyst can strain a molecule's bonds, so this is a true statement.

D. true: lowering the activation energy is how a catalyst speeds up a reaction.

Question 69 Which of the following processes is endothermic?

Which of the following processes is endothermic?

- A. formation of ammonia in Haber's process
- B. neutralization of a strong acid with strong base
- C. Dissolution of ammonium chloride in water ✓ **Correct answer**
- D. $C(s) + O2 \rightarrow CO2(g)$
- E. All are endothermic

A. wrong: the Haber process is exothermic (heat is released).

B. wrong: neutralisation is exothermic.

C. correct: dissolving ammonium chloride absorbs heat, so it is endothermic.

D. wrong: combustion of carbon is exothermic.

E. wrong: only the dissolution of ammonium chloride is endothermic.

70 Which reagent gives a colorless homogeneous solution when

Which reagent gives a colorless homogeneous solution when added to phenol?

- A. Aqueous bromine
- B. Aqueous sodium carbonate
- C. Aqueous sodium hydroxide ✓ **Correct answer**
- D. Aqueous sodium hydroxide and benzoyl chloride

A. wrong: phenol with aqueous bromine gives a white precipitate of 2,4,6-tribromophenol, not a colourless homogeneous solution.

B. wrong: phenol does not react with sodium carbonate (phenol is a weaker acid than carbonic acid), so no homogeneous solution forms.

C. correct: phenol reacts with aqueous NaOH to give soluble, colourless sodium phenoxide — a colourless homogeneous solution.

D. wrong: benzoyl chloride with phenol in NaOH gives phenyl benzoate, a white precipitate, not a homogeneous solution.

Question 71 Which substances has tetrahedral geometry?

Which substances has tetrahedral geometry?

- A. Benzene
- B. Methane ✓ **Correct answer**
- C. Cyclohexene
- D. None of the above

A. wrong: benzene is planar (hexagonal), not tetrahedral.

B. correct: methane has four C–H bonds arranged tetrahedrally (109.5°).

C. wrong: cyclohexene contains sp2 carbons and is not tetrahedral.

is is the printed key, but methane is tetrahedral.

Question 72 The _____ free radical takes part in the

The _____ free radical takes part in the destruction of the ozone layer.

- A. Chlorine ✓ **Correct answer**
- B. Helium
- C. Neon
- D. Xenon

A. correct: chlorine free radicals (from CFCs) catalyse the destruction of ozone.

B. wrong: helium is inert and does not attack ozone.

C. wrong: neon is inert and does not attack ozone.

D. wrong: xenon is inert and does not attack ozone.

Question 73 How many atoms of carbon are present in

How many atoms of carbon are present in 18 g of glucose, C6 H12 O6?

- A. 6.0 x 10^22
- B. 3.6 x 10^23 ✓ **Correct answer**
- C. 6.0 x 10^23
- D. 3.6 x 10^24
- E. 6.0 x 10^24

A. wrong: 18 g of glucose is 0.1 mol, giving 0.6 mol of carbon atoms, which is 3.6 x 10^23 atoms.

B. correct: 18 g of glucose (C6H12O6, Mr = 180) is 0.1 mol, so carbon atoms = 0.1 x 6 x 6.0 x 10^23 = 3.6 x 10^23.

C. wrong: that would be one mole of carbon atoms; here there are 0.6 mol.

e number is 3.6 x 10^23, ten times smaller.

E. wrong: the number is 3.6 x 10^23.

Question 74 Which property of a gas affects the rate

Which property of a gas affects the rate at which it spreads throughout a laboratory?

- A. Boiling point
- B. Molecular mass ✓ **Correct answer**
- C. Reactivity
- D. Solubility in water

A. wrong: the boiling point does not govern how fast a gas spreads through a room.

B. correct: by Graham's law the rate of diffusion of a gas depends on its molecular mass (lighter gases spread faster).

C. wrong: reactivity does not affect the rate of spreading.

D. wrong: solubility in water does not affect how fast a gas spreads through air.

Question 75 In the structural formula of suphuric acid, What

In the structural formula of suphuric acid, What is the total number of electrons in the covalent bonds surrounding the sulphur atom?

- A. 4
- B. 6 ✓ **Correct answer**
- C. 8
- D. 12

A. wrong: sulphur contributes 6 electrons to the S–O bonds, not 4.

B. correct: sulphur uses all 6 of its valence electrons in the four S–O bonds (two single bonds contributing 1 each and two double bonds contributing 2 each).

lphur contributes 6 electrons, not 8.

D. wrong: 12 counts the electrons contributed by both partners in the bonds; the question asks for the electrons sulphur itself contributes, which is 6.

Question 76 One mole of an organic compound is completely

One mole of an organic compound is completely burnt in oxygen. Which compound produces exactly three moles of water?

- A. Butane C4 H20
- B. Butanol C4 H9OH
- C. Ethanol C2 H5OH ✓ **Correct answer**
- D. Propane C3 H8

A. wrong: butane (C4H10) gives 5 moles of water on complete combustion, not 3.

B. wrong: butanol (C4H10O) gives 5 moles of water, not 3.

C. correct: C2H5OH + 3O2 → 2CO2 + 3H2O, exactly 3 moles of water.

D. wrong: propane gives 4 moles of water, not 3.

Question 77 Which pair are isomers of each other?

Which pair are isomers of each other?

- A. Ethane, Ethanol
- B. Ethanoic Acid, Ethanol
- C. Propanol, 2-Propanol ✓ **Correct answer**
- D. Ethene, Butene

A. wrong: ethane (C2H6) and ethanol (C2H6O) have different molecular formulas, so they cannot be isomers.

B. wrong: ethanoic acid (C2H4O2) and ethanol (C2H6O) have different molecular formulas.

propan-1-ol and propan-2-ol have the same formula (C3H8O) with the OH group in different positions — position isomers.

D. wrong: ethene (C2H4) and butene (C4H8) have different molecular formulas.

Question 78 When must a substances be an alkane?

When must a substances be an alkane?

- A. When it burns in air or in oxygen
- B. When it contains carbon and hydrogen only
- C. When it has the general formula Cn H2n+2 ✓ **Correct answer**
- D. When it is generally un-reactive

A. wrong: many compounds (alkenes, alcohols, etc.) burn in air.

B. wrong: alkenes and alkynes also contain only carbon and hydrogen.

C. correct: the general formula CnH2n+2 defines the alkanes.

D. wrong: low reactivity is a property of alkanes, not their definition.

Question 79 Which statement shows that diamond and graphite are

Which statement shows that diamond and graphite are allotropes of carbon?

- A. Both have giant molecular structures
- B. Complete combustion produces equal masses of carbon dioxide is the only product ✓ **Correct answer**
- C. Graphite conducts electricity, whereas diamond does not
- D. Under suitable conditions, graphite can be converted into diamond

A. wrong: having a giant structure is true of both, but it does not show they are the same element.

equal masses of diamond and graphite give equal masses of carbon dioxide as the only product, showing both are pure carbon — hence allotropes.

C. wrong: the difference in conductivity is true, but it does not show they are allotropes.

D. wrong: interconversion is true, but it does not by itself show they are allotropes.

Question 80 If Auf.bau rule is not followed in filling

If Auf.bau rule is not followed in filling of the sub shell then the block of which elements will change in the periodic table.

- A. K (19) ✓ **Correct answer**
- B. Se (21)
- C. V (23)
- D. Ni (28)

A. correct: with the Aufbau rule the 19th electron enters 4s, making potassium an s-block element; without it the electron would enter 3d, moving potassium to the d-block.

B. wrong: the print's element is mislabelled (selenium is 34; 21 is scandium), and scandium is a d-block element with or without the Aufbau rule.

C. wrong: vanadium is a d-block element whether or not the Aufbau rule is followed.

D. wrong: nickel is a d-block element whether or not the Aufbau rule is followed.

Question 81 Which gas shows real behavior?

Which gas shows real behavior?

- A. 8 g O2 at S.T.P occupies a volume of 5.6 lit
- B. 1g H2 in 0.5 lit flask exerts pressure of 24.63 atm at 300 K
- C. 1 mole NH3 at 300 K and 1atm occupies volume 22.4 lit ✓ **Correct answer**
- D. 5.6 lit of CO2 at STP is equal to 11 g

g of O2 is 0.25 mol, which occupies 5.6 L at STP — ideal-gas behaviour.

B. wrong: 1 g of H2 is 0.5 mol, and P = nRT/V = 0.5 x 0.0821 x 300/0.5 = 24.63 atm — ideal-gas behaviour.

C. correct: the ideal volume at 300 K and 1 atm is about 24.6 L, not 22.4 L; ammonia is polar and hydrogen-bonded, so it shows real (non-ideal) behaviour.

D. wrong: 5.6 L at STP is 0.25 mol of CO2, which is 11 g — ideal-gas behaviour.

Question 82 Heat of neutralization of strong acid by strong

Heat of neutralization of strong acid by strong base is constant value because

- A. Salts formed does not hydrolyze
- B. Only H+ and OH- ions react in each case ✓ **Correct answer**
- C. Strong base and strong acid react completely
- D. Strong base and strong acid react in aqueous solution

A. wrong: whether the salt hydrolyses is not why the heat of neutralisation is constant.

B. correct: every strong acid–strong base neutralisation is the same reaction, H+ + OH- → H2O, so the heat released is the same.

C. wrong: completeness is not the reason the value is constant.

D. wrong: the medium is not the reason the value is constant.

Question 83 Compared with alkaline earth metals the alkali metals

Compared with alkaline earth metals the alkali metals exhibit

- A. Smaller ionic radii
- B. Greater hardness
- C. Hiegh boiling point

ver ionization energy ✓ **Correct answer**

A. wrong: alkali metals have larger ionic radii than the alkaline earth metals of the same period.

B. wrong: alkali metals are softer than alkaline earth metals.

C. wrong: alkali metals have lower boiling points than alkaline earth metals.

D. correct: alkali metals have only one valence electron to remove, so their first ionisation energy is lower than that of the alkaline earth metals.

Question 84 The number and types of bonds between two

The number and types of bonds between two carbons atoms in CaC2 are

- A. One sigma and one pi bonds
- B. One sigma and two pi bonds ✓ **Correct answer**
- C. Two sigma two bonds
- D. One sigma bond

A. wrong: the C2^2- ion in CaC2 has a triple bond, which is one sigma and two pi bonds.

B. correct: the two carbon atoms in calcium carbide are joined by a triple bond — one sigma bond and two pi bonds.

C. wrong: there is one sigma bond, not two, and the bond is a triple bond.

D. wrong: the bond is a triple bond, not a single sigma bond.

Question 85 The alloy of copper and tin is called

The alloy of copper and tin is called

- A. Brass
- B. Bronze ✓ **Correct answer**
- C. German silver

A. wrong: brass is the alloy of copper and zinc.

B. correct: bronze is the alloy of copper and tin.

C. wrong: German silver is an alloy of copper, zinc and nickel.

D. wrong: metal is not the name of the copper–tin alloy.

Question 86 Which of the following is not an electrophile?

Which of the following is not an electrophile?

- A. NH3 ✓ **Correct answer**
- B. BCl3
- C. AlCl3
- D. Hg2+

A. correct: ammonia has a lone pair and acts as a nucleophile (Lewis base), not an electrophile.

B. wrong: boron trichloride is electron-deficient and is an electrophile.

C. wrong: aluminium chloride is electron-deficient and is an electrophile.

D. wrong: this is the printed key, but Hg2+ is a metal cation that accepts electron pairs, so it is an electrophile.

Question 87 How many isomers are possible for the compound

How many isomers are possible for the compound having molecular having molecular formula C3H5Br

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

A. wrong: this is the printed key, but C3H5Br has 4 structural isomers, not 2.

B. correct: the structural isomers are 1-bromopropene, 2-bromopropene, 3-bromopropene (allyl bromide) and bromocyclopropane (5 counting cis- and trans-1-bromopropene separately).

C. wrong: there are 4 structural isomers (5 with stereoisomers), not 6.

D. wrong: there are 4 structural isomers (5 with stereoisomers), not 8.

Question 88 Which xylene is most easily sulphonated

Which xylene is most easily sulphonated

- A. Ortho ✓ **Correct answer**
- B. Para
- C. Meta
- D. All give same rate

A. correct: ortho-xylene sulphonates most easily, since both methyl groups activate the ring towards the positions available for sulphonation.

B. wrong: para-xylene sulphonates more slowly than ortho-xylene.

C. wrong: meta-xylene sulphonates most slowly of the three.

D. wrong: the three xylenes sulphonate at different rates.

Question 89 Which one of the following is likely to

Which one of the following is likely to give a precipitate with AgNO3 solution?

- A. CCl4
- B. CHCl3
- C. CH2=CHCl

3)3CCl ✓ **Correct answer**

A. wrong: this is the printed key, but carbon tetrachloride has covalent C–Cl bonds that do not ionise, so it gives no precipitate with AgNO3.

B. wrong: chloroform has covalent C–Cl bonds and gives no precipitate.

C. wrong: vinyl chloride has a covalent C–Cl bond and gives no precipitate.

D. correct: tert-butyl chloride ionises readily (SN1) to give chloride ions, which form a white precipitate of AgCl with AgNO3.

Question 90 In Sp3d hybridization, the o orbital that participates

In Sp3d hybridization, the o orbital that participates in hybridization is

- A. dx2 - y2
- B. dz2 ✓ **Correct answer**
- C. dxy
- D. dxz

A. wrong: the dx2−y2 orbital is used in dsp2 (square planar) hybridisation, not sp3d.

B. correct: in sp3d hybridisation the dz2 orbital (pointing along the axis) participates with the s and the three p orbitals.

C. wrong: the dxy orbital does not participate in sp3d hybridisation.

D. wrong: the dxz orbital does not participate in sp3d hybridisation.

Question 91 Which is not a past from of a

Which is not a past from of a verb.

- A. Was
- B. Had
- C. Looked

- E. Hear ✓ **Correct answer**

A. wrong: was is the past form of is.

B. wrong: had is the past form of have.

C. wrong: looked is the past form of look.

D. wrong: spoke is the past form of speak.

E. correct: hear is the present form; its past form is heard.

Question 92 Which contains an adjective?

Which contains an adjective?

- A. Old man ✓ **Correct answer**
- B. On Tuesday
- C. She said
- D. And you
- E. Afternoon

A. correct: old is an adjective describing the noun man.

B. wrong: on Tuesday is a prepositional phrase, not an adjective.

C. wrong: she said is a clause with a pronoun and a verb, with no adjective.

D. wrong: and you is a conjunction plus a pronoun, with no adjective.

E. wrong: afternoon is a noun, not an adjective.

Question 93 Which contains an adverb

Which contains an adverb

house

- B. Three women
- C. Was dirty
- D. Very funny ✓ **Correct answer**
- E. Early morning

A. wrong: full is an adjective describing house.

B. wrong: three is a numeral adjective describing women.

C. wrong: dirty is an adjective (a complement), not an adverb.

D. correct: very is an adverb modifying the adjective funny.

E. wrong: early is an adjective describing morning.

Question 94 Which is not correct

Which is not correct

- A. In February
- B. On 5:00 o'clock ✓ **Correct answer**
- C. At my house
- D. Near me
- E. On May 2

A. wrong: in February is correct (in with a month).

B. correct: this is the incorrect phrase — clock time takes at (at 5 o'clock), not on.

C. wrong: at my house is correct.

D. wrong: near me is correct English.

E. wrong: on May 2 is correct (on with a date).

95 He complains ___ headache.

He complains ___ headache.

- A. at
- B. from
- C. of ✓ **Correct answer**
- D. to

A. wrong: one complains of a headache, not at a headache.

B. wrong: one complains of a headache, not from a headache.

C. correct: the correct preposition is of — he complains of headache.

D. wrong: one complains of a headache, not to a headache.

Question 96 Sharks differ from other fish in that their

Sharks differ from other fish in that their skeleton are made of cartilage instead bone. A B C D

- A. with
- B. in
- C. at
- D. from

No answer is given for this question, and none is taught. DEFECTIVE — EXCLUDED, no answer asserted (printed key B "in"; The sentence needs 'of' after 'instead' ('instead of bone'); 'of' is not among the options (with / in / at / from), and the keyed 'in' already occurs in the stem ('in that') and fills no gap. No correct option is offered. Decided by the assistant under the owner's 8 Nov 2026 delegation)

A. wrong: "instead with bone" is not English; the sentence needs "of" after "instead".

B. wrong: this is the keyed answer, but "in" already occurs in the stem ("in that") and

one" is not English; the sentence needs "of".

C. wrong: "instead at bone" is not English; the sentence needs "of" after "instead".

D. wrong: "instead from bone" is not English; the sentence needs "of" after "instead". No correct option is offered, so this question is DEFECTIVE-excluded.

Question 97 STAGNATE

STAGNATE

- A. Active
- B. Vegetate ✓ **Correct answer**
- C. Vigorous
- D. Bewilder

A. wrong: active is the opposite of stagnate.

B. correct: to stagnate is to stop developing and live a dull, inactive life — to vegetate.

C. wrong: vigorous is the opposite of stagnate.

D. wrong: to bewilder is to confuse, not to stagnate.

Question 98 ASTOUND

ASTOUND

- A. Shock ✓ **Correct answer**
- B. Confer
- C. Condescend
- D. Strengthen

A. correct: to astound is to shock or amaze.

B. wrong: to confer is to discuss or bestow, not to astound.

condescend is to talk down to someone, not to astound.

D. wrong: to strengthen is to make stronger, not to astound.

Question 99 SCORN

SCORN

- A. Cleans
- B. Ridicule ✓ **Correct answer**
- C. Scrutinize
- D. Stifle

A. wrong: to clean is to make clean, not to scorn.

B. correct: scorn is contempt or ridicule.

C. wrong: to scrutinize is to examine closely, not to scorn.

D. wrong: to stifle is to suppress, not to scorn.

Question 100 WISP

WISP

- A. Tuft ✓ **Correct answer**
- B. Pack
- C. Smell
- D. Spry

A. correct: a wisp is a small bundle or tuft (of hair, straw, smoke).

B. wrong: a pack is a large bundle, not a wisp.

C. wrong: a smell is an odour, not a wisp.

D. wrong: spry means lively or nimble, not a wisp.

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