AME CET Technical Aptitude

Sample Paper – 2

Duration: 30 Minutes **Maximum Marks: 120**

Instructions

- This paper contains **30** Multiple Choice Questions (Single Correct Answer), covering **Mechanical & Applied-Physics Aptitude** (Q1–15) and **Electrical, Electronics & Aviation Technical Fundamentals** (Q16–30), in the **AME CET** marking style.
- Each correct answer carries **+4 marks**. Each wrong answer carries -1 **mark**. Unattempted questions carry **0 marks**.
- Only **one** option is correct per question. Choose carefully.
- This is a **supplementary technical-aptitude practice set** for AME CET aspirants; pacing is one minute per question, matching the main exam.
- Use of mobile phones, calculators, or any electronic gadget is strictly prohibited.

Part A: Mechanical & Applied-Physics Aptitude

Q1. A body of mass 3 kg is given an acceleration of 6 m/s^2. The net force acting on the body is:

(A) 2 N

(B) 9 N

(C) 0.5 N

(D) 18 N

Q2. A constant force of 20 N acts on a body for 4 seconds. The impulse delivered to the body is:

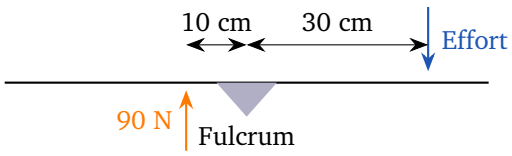
(A) 5 N·s

(B) 80 N·s

(C) 24 N·s

(D) 16 N·s

Q3. In the class-1 lever shown, a load of 90 N hangs at 10 cm from the fulcrum and the effort acts at 30 cm from the fulcrum. The effort needed to balance the lever is:



(A) 270 N

(B) 9 N

(C) 30 N

(D) 100 N

Q4. A mass of 5 kg is lifted vertically through a height of 4 m. Taking $g = 10$ m/s^2, the work done against gravity is:

(A) 20 J

(B) 200 J

(C) 9 J

(D) 50 J

Q5. A vehicle moves at a steady speed of 3 m/s while the engine exerts a forward driving force of 100 N. The power developed by the engine is:

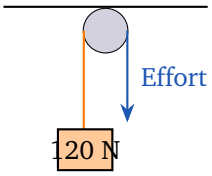
(A) 33.3 W

(B) 103 W

(C) 97 W

(D) 300 W

Q6. A single fixed pulley (ideal, weightless and frictionless) is used to lift a load of 120 N, as shown. The effort required is:



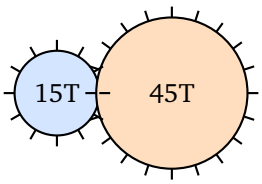
(A) 120 N

(B) 60 N

(C) 240 N

(D) 30 N

Q7. A driver gear with 15 teeth meshes with a driven gear of 45 teeth, as shown. The gear ratio (driven to driver) of this pair is:



(A) 1 : 1

(B) 1 : 3

(C) 3 : 1

(D) 30 : 1

Q8. A wire of original length 100 mm stretches by 0.5 mm under a load. The strain produced in the wire is:

(A) 0.5

(B) 0.005

(C) 50

(D) 200

Q9. The property of a metal that allows it to be hammered or rolled into thin sheets is called:

(A) Malleability

(B) Ductility

(C) Brittleness

(D) Hardness

Q10. The SI unit of force is the:

(A) Newton

(B) Pascal

(C) Joule

(D) Watt

Q11. A vernier caliper has its main-scale smallest division equal to 1 mm, and 10 vernier divisions coincide with 9 main-scale divisions. The least count of the caliper is:

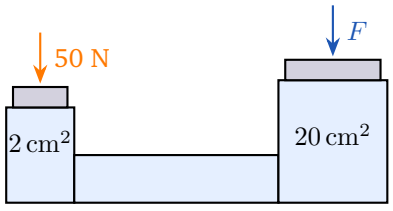
(A) 1 mm

(B) 0.5 mm

(C) 0.9 mm

(D) 0.1 mm

Q12. In the hydraulic press shown, a force of 50 N is applied on the small piston of area $2\ \text{cm}^2$. The large piston has an area of $20\ \text{cm}^2$. The output force on the large piston is:



(A) 5 N

(B) 500 N

(C) 50 N

(D) 1000 N

Q13. A solid block has a mass of 600 g and a volume of 300 cm^3. The density of the block is:

(A) 0.5 g/cm^3

(B) 900 g/cm^3

(C) 300 g/cm^3

(D) 2 g/cm^3

Q14. The heat required to completely melt 2 kg of ice at $0\,^\circ$C into water at $0\,^\circ$C, given the latent heat of fusion of ice is 3.34×10^5 J/kg, is:

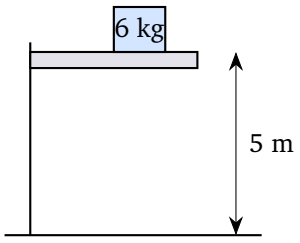
(A) 1.67×10^5 J

(B) 3.34×10^5 J

(C) 6.68×10^5 J

(D) 3.34×10^2 J

Q15. A box of mass 6 kg is placed on a shelf at a height of 5 m above the floor, as shown. Taking $g = 10$ m/s^2, its gravitational potential energy is:



(A) 30 J

(B) 300 J

(C) 11 J

(D) 60 J

Part B: Electrical, Electronics & Aviation Technical Fundamentals

Q16. A voltage of 12 V is applied across a resistor of 4 Ω. The current flowing through the resistor is:

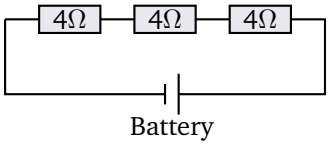
(A) 48 A

(B) 16 A

(C) 3 A

(D) 8 A

Q17. Three resistors, each of 4 Ω, are connected in series, as shown. The total resistance of the circuit is:



(A) 1.33 Ω

(B) 8 Ω

(C) 4 Ω

(D) 12 Ω

Q18. Two resistors, each of 10 Ω, are connected in parallel. Their combined resistance is:

(A) 5 Ω

(B) 20 Ω

(C) 10 Ω

(D) 15 Ω

Q19. A device draws a current of 5 A when connected across a 12 V supply. The power consumed by the device is:

(A) 2.4 W

(B) 60 W

(C) 17 W

(D) 7 W

Q20. Two identical cells, each of EMF 2 V, are connected in series. The total EMF of the combination is:

(A) 1 V

(B) 2 V

(C) 4 V

(D) 0.5 V

Q21. Which of the following machines converts mechanical energy into electrical energy?

(A) Generator

(B) Transformer

(C) Battery

(D) Motor

Q22. A current-carrying solenoid (a long coil of wire) behaves like a:

(A) bar magnet with a north and a south pole

(B) simple resistor with no magnetic effect

(C) capacitor that stores charge

(D) insulator that blocks all current

Q23. In electronic circuits, a transistor is most commonly used as a:

(A) device that stores electric charge

(B) switch or an amplifier

(C) source of constant EMF

(D) device that emits light

Q24. Direct current (DC), such as that supplied by an aircraft battery, is best described as a current that:

(A) flows steadily in one direction only

(B) periodically reverses its direction

(C) is always equal to zero

(D) exists only in insulators

Q25. The cockpit instrument that indicates the speed of the aircraft relative to the surrounding air is the:

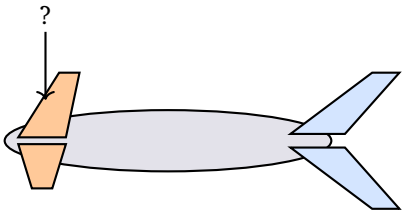
(A) Altimeter

(B) Magnetic compass

(C) Airspeed indicator

(D) Tachometer

Q26. In the simplified aircraft outline shown, the tail assembly at the rear of the aircraft, which provides stability, is called the:



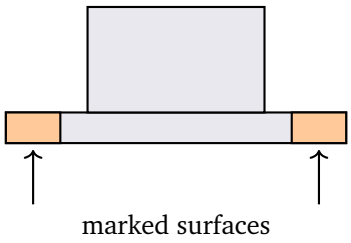
(A) Fuselage

(B) Nacelle

(C) Aileron

(D) Empennage

Q27. The control surface marked on the horizontal tail in the figure deflects up or down to pitch the aircraft nose-up or nose-down. This surface is the:



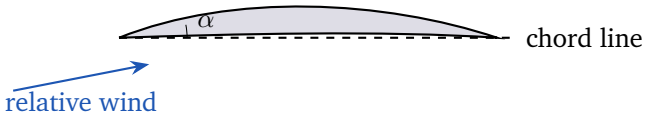
(A) Elevator

(B) Rudder

(C) Aileron

(D) Flap

Q28. For the aerofoil shown, the angle marked between the chord line of the wing and the direction of the oncoming relative wind is called the:



(A) Dihedral angle

(B) Camber angle

(C) Angle of attack

(D) Sweep angle

Q29. When an aircraft flies straight and level at a constant speed, the thrust produced by the engines exactly balances the:

(A) Lift

(B) Drag

(C) Weight

(D) Gravity

Q30. Which aircraft system is responsible for storing fuel and delivering it to the engines at the correct pressure and flow?

(A) Hydraulic system

(B) Oxygen system

(C) Electrical system

(D) Fuel system

Detailed Solutions

Q1.

Solution

Concept — Newton's second law: The net force on a body equals the product of its mass and its acceleration, $F = ma$.

Step 1 — Write the formula:

$$F = ma$$

Step 2 — Substitute the values $m = 3$ kg and $a = 6$ m/s^2:

$$F = 3 \times 6$$

Step 3 — Simplify:

$$F = 18 \text{ N}$$

Why other options are wrong:

- Option A (2): divides acceleration by mass instead of multiplying.
- Option B (9): adds mass and acceleration.
- Option C (0.5): divides mass by acceleration, inverting the formula.

Final Answer: 18 N $\Rightarrow$ D

Answer: (D) Go Back to Q1

Q2.

Solution

Concept — Impulse: The impulse of a constant force equals the force multiplied by the time for which it acts, $J = F\,\Delta t$.

Step 1 — Write the formula:

$$J = F\,\Delta t$$

Step 2 — Substitute $F = 20$ N and $\Delta t = 4$ s:

$$J = 20 \times 4$$

Step 3 — Simplify:

$$J = 80 \text{ N} \cdot \text{s}$$

Why other options are wrong:

- Option A (5): divides force by time instead of multiplying.
- Option C (24): adds force and time.
- Option D (16): subtracts time from force.

Final Answer: 80 N·s $\Rightarrow$ B

Answer: (B) Go Back to Q2

Q3.

Solution

Concept — Principle of moments: For a lever in balance, the moment of the effort equals the moment of the load about the fulcrum: Effort $\times$ effort arm $=$ Load $\times$ load arm.

Step 1 — Write the balance condition:

$$\text{Effort} \times \text{effort arm} = \text{Load} \times \text{load arm}$$

Step 2 — Substitute Load $= 90$ N, load arm $= 10$ cm, effort arm $= 30$ cm:

$$\text{Effort} \times 30 = 90 \times 10$$

Step 3 — Compute the right-hand side:

$$\text{Effort} \times 30 = 900$$

Step 4 — Solve for the effort:

$$\text{Effort} = \frac{900}{30} = 30 \text{ N}$$

Why other options are wrong:

- Option A (270): multiplies load by the effort arm instead of the load arm.
- Option B (9): divides load by 10 only, ignoring the effort arm.
- Option D (100): not supported by the moment balance.

Final Answer: 30 N $\Rightarrow$ C

Answer: (C) Go Back to Q3

Q4.

Solution

Concept — Work done against gravity: Lifting a mass through a height h requires work equal to its weight times the height, $W = mgh$.

Step 1 — Write the formula:

$$W = mgh$$

Step 2 — Substitute $m = 5$ kg, $g = 10$ m/s^2, $h = 4$ m:

$$W = 5 \times 10 \times 4$$

Step 3 — Multiply step by step:

$$5 \times 10 = 50$$

$$50 \times 4 = 200 \text{ J}$$

Why other options are wrong:

- Option A (20): multiplies only mass and height, omitting g.
- Option C (9): adds mass and height instead of multiplying.
- Option D (50): stops after $m \times g$, omitting the height.

Final Answer: 200 J $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q4

Q5.

Solution

Concept — Power as force times velocity: When a force moves a body at constant velocity in its own direction, the power delivered is $P = Fv$.

Step 1 — Write the formula:

$$P = Fv$$

Step 2 — Substitute $F = 100$ N and $v = 3$ m/s:

$$P = 100 \times 3$$

Step 3 — Simplify:

$$P = 300 \text{ W}$$

Why other options are wrong:

- Option A (33.3): divides force by velocity instead of multiplying.
- Option B (103): adds force and velocity.
- Option C (97): subtracts velocity from force.

Final Answer: 300 W $\Rightarrow$ D

Answer: (D) Go Back to Q5

Q6.

Solution

Concept — Single fixed pulley: An ideal single fixed pulley only changes the direction of the effort; it has a mechanical advantage of 1, so the effort equals the load.

Step 1 — State the mechanical advantage:

$$\text{MA} = 1$$

Step 2 — Relate effort and load:

$$\text{Effort} = \frac{\text{Load}}{\text{MA}} = \frac{120}{1}$$

Step 3 — Simplify:

$$\text{Effort} = 120 \text{ N}$$

Why other options are wrong:

- Option B (60): assumes a mechanical advantage of 2, which a fixed pulley does not give.
- Option C (240): doubles the load.
- Option D (30): uses a mechanical advantage of 4.

Final Answer: 120 N $\Rightarrow$ A

Answer: (A) Go Back to Q6

Q7.

Solution

Concept — Gear ratio: The gear ratio of a meshing pair is the number of teeth on the driven gear divided by the number of teeth on the driver gear.

Step 1 — Write the relation:

$$\text{Gear ratio} = \frac{T_{\text{driven}}}{T_{\text{driver}}}$$

Step 2 — Substitute $T_{\text{driven}} = 45$ and $T_{\text{driver}} = 15$:

$$\text{Gear ratio} = \frac{45}{15}$$

Step 3 — Simplify:

$$\frac{45}{15} = 3$$

Step 4 — Express as a ratio:

$$\text{Gear ratio} = 3 : 1$$

Why other options are wrong:

- Option A (1:1): would require equal teeth on both gears.
- Option B (1:3): inverts the ratio (driver over driven).
- Option D (30:1): subtracts the tooth counts rather than dividing.

Final Answer: $3 : 1 \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q7

Q8.

Solution

Concept — Strain: Strain is the change in length divided by the original length, $\varepsilon = \Delta L/L$. It is a pure ratio with no units.

Step 1 — Write the formula:

$$\varepsilon = \frac{\Delta L}{L}$$

Step 2 — Substitute $\Delta L = 0.5$ mm and $L = 100$ mm:

$$\varepsilon = \frac{0.5}{100}$$

Step 3 — Simplify:

$$\varepsilon = 0.005$$

Why other options are wrong:

- Option A (0.5): forgets to divide by the original length.
- Option C (50): inverts the ratio (length over extension).
- Option D (200): inverts and misplaces the decimal.

Final Answer: 0.005 $\Rightarrow$ B

Answer: (B) Go Back to Q8

Q9.

Solution

Concept — Mechanical properties of metals: Malleability is the ability of a material to be hammered or rolled into thin sheets without breaking.

Step 1 — Match the definition: Being shaped into "thin sheets" by hammering or rolling is the defining description of malleability.

Step 2 — Confirm the property: Metals such as gold and aluminium are highly malleable, which is why they can be beaten into foils.

Why other options are wrong:

- Option B (Ductility): the ability to be drawn into wires, not sheets.
- Option C (Brittleness): brittle materials crack instead of flattening.
- Option D (Hardness): resistance to scratching or indentation, unrelated to sheet forming.

Final Answer: Malleability $\Rightarrow$ A

Answer: (A) Go Back to Q9

Q10.

Solution

Concept — SI units: Force is measured in newtons (N); one newton is the force that gives a 1 kg mass an acceleration of 1 m/s^2.

Step 1 — Recall the definition of force:

$$F = ma, \qquad 1\ \text{N} = 1\ \text{kg} \cdot \text{m/s}^2$$

Step 2 — Name the unit: The SI unit of force is the newton.

Why other options are wrong:

- Option B (Pascal): the unit of pressure.
- Option C (Joule): the unit of energy or work.
- Option D (Watt): the unit of power.

Final Answer: Newton $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q10

Q11.

Solution

Concept — Least count of a vernier caliper: The least count equals one main-scale division divided by the number of vernier divisions.

Step 1 — Write the formula:

$$\text{Least count} = \frac{1\ \text{main-scale division}}{\text{number of vernier divisions}}$$

Step 2 — Identify the values: One main-scale division $= 1$ mm and there are 10 vernier divisions.

Step 3 — Substitute:

$$\text{Least count} = \frac{1}{10}$$

Step 4 — Simplify:

$$\text{Least count} = 0.1\ \text{mm}$$

Why other options are wrong:

- Option A (1): takes the main-scale division itself as the least count.

- Option B (0.5): halves the division, which is not how a vernier works.
- Option C (0.9): mistakes the 9-division overlap for the least count.

Final Answer: 0.1 mm $\Rightarrow$ D

Answer: (D) Go Back to Q11

Q12.

Solution

Concept — Hydraulic press (Pascal's law): Pressure is transmitted equally, so the output force scales with the area ratio: $\frac{F_2}{F_1} = \frac{A_2}{A_1}$.

Step 1 — Write the relation:

$$F_2 = F_1 \times \frac{A_2}{A_1}$$

Step 2 — Substitute $F_1 = 50$ N, $A_1 = 2$ cm^2, $A_2 = 20$ cm^2:

$$F_2 = 50 \times \frac{20}{2}$$

Step 3 — Simplify the area ratio:

$$\frac{20}{2} = 10$$

Step 4 — Compute:

$$F_2 = 50 \times 10 = 500 \text{ N}$$

Why other options are wrong:

- Option A (5): divides by the area ratio instead of multiplying.
- Option C (50): ignores the area ratio entirely.
- Option D (1000): doubles the correct result.

Final Answer: 500 N $\Rightarrow$ B

Answer: (B) Go Back to Q12

Q13.

Solution

Concept — Density: Density is mass per unit volume, $\rho = m/V$.

Step 1 — Write the formula:

$$\rho = \frac{m}{V}$$

Step 2 — Substitute $m = 600$ g and $V = 300$ cm^3:

$$\rho = \frac{600}{300}$$

Step 3 — Simplify:

$$\rho = 2 \text{ g/cm}^3$$

Why other options are wrong:

- Option A (0.5): divides volume by mass, inverting the formula.
- Option B (900): adds mass and volume.
- Option C (300): uses only the volume value.

Final Answer: 2 g/cm$^3 \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q13

Q14.

Solution

Concept — Latent heat of fusion: The heat needed to melt a solid at its melting point is $Q = mL$, where L is the latent heat of fusion.

Step 1 — Write the formula:

$$Q = mL$$

Step 2 — Substitute $m = 2$ kg and $L = 3.34 \times 10^5$ J/kg:

$$Q = 2 \times 3.34 \times 10^5$$

Step 3 — Multiply:

$$Q = 6.68 \times 10^5 \text{ J}$$

Why other options are wrong:

- Option A (1.67×10^5): divides by 2 instead of multiplying.
- Option B (3.34×10^5): uses the latent heat for 1 kg only.
- Option D (3.34×10^2): uses the wrong power of ten.

Final Answer: 6.68×10^5 J $\Rightarrow$ C

Answer: (C) Go Back to Q14

Q15.

Solution

Concept — Gravitational potential energy: The potential energy of a raised body is PE $= mgh$.

Step 1 — Write the formula:

$$\text{PE} = mgh$$

Step 2 — Substitute $m = 6$ kg, $g = 10$ m/s^2, $h = 5$ m:

$$\text{PE} = 6 \times 10 \times 5$$

Step 3 — Multiply step by step:

$$6 \times 10 = 60$$

$$60 \times 5 = 300 \text{ J}$$

Why other options are wrong:

- Option A (30): multiplies only mass and height, omitting g.
- Option C (11): adds the three quantities instead of multiplying.
- Option D (60): stops after $m \times g$, omitting the height.

Final Answer: 300 J $\Rightarrow$ B

Answer: (B) Go Back to Q15

Q16.

Solution

Concept — Ohm's law: The current through a resistor equals the voltage across it divided by its resistance, $I = V/R$.

Step 1 — Write the formula:

$$I = \frac{V}{R}$$

Step 2 — Substitute $V = 12$ V and $R = 4\ \Omega$:

$$I = \frac{12}{4}$$

Step 3 — Simplify:

$$I = 3\ \text{A}$$

Why other options are wrong:

- Option A (48): multiplies voltage by resistance instead of dividing.
- Option B (16): adds voltage and resistance.
- Option D (8): subtracts resistance from voltage.

Final Answer: 3 A $\Rightarrow$ C

Answer: (C) Go Back to Q16

Q17.

Solution

Concept — Resistors in series: In a series circuit the total resistance is the sum of the individual resistances.

Step 1 — Write the formula:

$$R_{\text{total}} = R_1 + R_2 + R_3$$

Step 2 — Substitute three resistors of $4\ \Omega$ each:

$$R_{\text{total}} = 4 + 4 + 4$$

Step 3 — Add:

$$R_{\text{total}} = 12\ \Omega$$

Why other options are wrong:

- Option A (1.33): uses the parallel formula by mistake.
- Option B (8): adds only two of the three resistors.
- Option C (4): gives the value of a single resistor.

Final Answer: $12\ \Omega \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q17

Q18.

Solution

Concept — Two equal resistors in parallel: For two equal resistors in parallel, the combined resistance is half of one resistor.

Step 1 — Write the parallel formula:

$$\frac{1}{R_{\text{p}}} = \frac{1}{R} + \frac{1}{R}$$

Step 2 — Substitute $R = 10\ \Omega$:

$$\frac{1}{R_{\text{p}}} = \frac{1}{10} + \frac{1}{10} = \frac{2}{10}$$

Step 3 — Invert to find R_{p}:

$$R_{\text{p}} = \frac{10}{2} = 5\ \Omega$$

Why other options are wrong:

- Option B (20): adds the resistors as if in series.
- Option C (10): leaves a single resistor value.
- Option D (15): an arithmetic error.

Final Answer: $5\ \Omega \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q18

Q19.

Solution

Concept — Electrical power: The power consumed by a device equals the product of the voltage across it and the current through it, $P = VI$.

Step 1 — Write the formula:

$$P = VI$$

Step 2 — Substitute $V = 12$ V and $I = 5$ A:

$$P = 12 \times 5$$

Step 3 — Simplify:

$$P = 60 \text{ W}$$

Why other options are wrong:

- Option A (2.4): divides voltage by current instead of multiplying.
- Option C (17): adds voltage and current.
- Option D (7): subtracts current from voltage.

Final Answer: 60 W $\Rightarrow$ B

Answer: (B) Go Back to Q19

Q20.

Solution

Concept — Cells in series: When cells are connected in series, their EMFs add up.

Step 1 — Write the relation:

$$E_{\text{total}} = E_1 + E_2$$

Step 2 — Substitute two cells of 2 V each:

$$E_{\text{total}} = 2 + 2$$

Step 3 — Add:

$$E_{\text{total}} = 4 \text{ V}$$

Why other options are wrong:

- Option A (1): divides instead of adding.
- Option B (2): the EMF of a single cell only.
- Option D (0.5): inverts and divides the EMFs.

Final Answer: 4 V $\Rightarrow$ C

Answer: (C) Go Back to Q20

Q21.

Solution

Concept — Electric generator: A generator uses electromagnetic induction to convert mechanical energy into electrical energy.

Step 1 — Identify the energy conversion: Input is mechanical rotation; output is electrical energy.

Step 2 — Match to the device: The machine performing mechanical $\rightarrow$ electrical conversion is the generator.

Why other options are wrong:

- Option B (Transformer): only changes AC voltage, with no mechanical input.
- Option C (Battery): stores chemical energy and supplies electrical energy.
- Option D (Motor): does the reverse conversion, electrical $\rightarrow$ mechanical.

Final Answer: Generator $\Rightarrow$ A

Answer: (A) Go Back to Q21

Q22.

Solution

Concept — Solenoid as an electromagnet: A current-carrying solenoid produces a magnetic field very similar to that of a bar magnet, with a definite north pole at one end and a south pole at the other.

Step 1 — Recall the field of a solenoid: The magnetic field lines inside the coil are nearly uniform and emerge from one end and enter the other.

Step 2 — Match the behaviour: This pattern is exactly that of a bar magnet, so a solenoid behaves like a bar magnet with two poles.

Why other options are wrong:

- Option B (simple resistor): ignores the magnetic field the current produces.
- Option C (capacitor): a capacitor stores charge, it does not create a magnetic field.
- Option D (insulator): a solenoid carries current, so it is not an insulator.

Final Answer: bar magnet with a north and a south pole $\Rightarrow$ A

Answer: (A) Go Back to Q22

Q23.

Solution

Concept — The transistor: A transistor is a three-terminal semiconductor device whose main uses are to amplify a weak signal or to act as an electronic switch.

Step 1 — Recall the transistor's functions: A small base current controls a much larger collector current, which allows amplification, and the device can be driven fully on or off as a switch.

Step 2 — Select the matching description: The transistor is most commonly used as a switch or an amplifier.

Why other options are wrong:

- Option A (stores charge): that is the role of a capacitor.
- Option C (source of EMF): that describes a cell or battery.
- Option D (emits light): that describes an LED.

Final Answer: switch or an amplifier $\Rightarrow$ B

Answer: (B) Go Back to Q23

Q24.

Solution

Concept — Direct current: DC is a current that flows steadily in one direction only, unlike AC whose direction reverses periodically.

Step 1 — Recall the definition: In a DC circuit, such as one powered by a battery, the charge carriers move in a single, fixed direction.

Step 2 — Select the matching description: "Flows steadily in one direction only"

is the defining feature of DC.

Why other options are wrong:

- Option B (reverses direction): describes alternating current (AC).
- Option C (always zero): then no current would flow at all.
- Option D (exists only in insulators): current flows in conductors, not insulators.

Final Answer: flows steadily in one direction only $\Rightarrow$ A

Answer: (A) Go Back to Q24

Q25.

Solution

Concept — Flight instruments: The airspeed indicator shows how fast the aircraft is moving through the surrounding air, using the difference between pitot (dynamic) and static pressure.

Step 1 — Match the function to the instrument: Showing speed relative to the air is the job of the airspeed indicator.

Step 2 — Confirm the principle: It compares the ram-air pressure at the pitot tube with the static pressure to derive the speed.

Why other options are wrong:

- Option A (Altimeter): shows height above sea level, not speed.
- Option B (Magnetic compass): shows heading or direction.
- Option D (Tachometer): shows engine or rotor rotational speed.

Final Answer: Airspeed indicator $\Rightarrow$ C

Answer: (C) Go Back to Q25

Q26.

Solution

Concept — Aircraft structure: The empennage is the tail assembly of an aircraft; it includes the horizontal and vertical stabilizers and provides stability and control.

Step 1 — Identify the marked part: The structure at the rear of the aircraft outline is the empennage (tail assembly).

Step 2 — Confirm its role: It keeps the aircraft pointing into the airflow and carries the elevator and rudder.

Why other options are wrong:

- Option A (Fuselage): the central body, not the tail.
- Option B (Nacelle): the housing around an engine.
- Option C (Aileron): a small control surface on the wing.

Final Answer: Empennage $\Rightarrow$ D

Answer: (D) Go Back to Q26

Q27.

Solution

Concept — Control surfaces: The elevator is the hinged surface on the horizontal tail; moving it up or down pitches the aircraft nose-up or nose-down about its lateral axis.

Step 1 — Identify the axis of motion: Pitching (nose up or down) is rotation about the lateral axis.

Step 2 — Match the surface: The surface controlling pitch, located on the horizontal tail, is the elevator.

Why other options are wrong:

- Option B (Rudder): on the vertical fin, controls yaw.
- Option C (Aileron): on the wings, controls roll.
- Option D (Flap): increases lift and drag for take-off and landing, it does not pitch the aircraft.

Final Answer: Elevator $\Rightarrow$ A

Answer: (A) Go Back to Q27

Q28.

Solution

Concept — Angle of attack: The angle of attack is the angle between the chord line of the wing and the direction of the oncoming relative wind.

Step 1 — Identify the two reference lines: One line is the chord line of the

aerofoil; the other is the relative wind.

Step 2 — Name the angle between them: The angle marked between these two lines is, by definition, the angle of attack.

Why other options are wrong:

- Option A (Dihedral angle): the upward angle of the wings seen from the front, not related to airflow.
- Option B (Camber angle): camber describes the curvature of the aerofoil, not an angle with the wind.
- Option D (Sweep angle): the backward angle of the wing in plan view.

Final Answer: Angle of attack $\Rightarrow$ C

Answer: (C) Go Back to Q28

Q29.

Solution

Concept — Four forces of flight: In steady level flight the four forces are in balance: thrust balances drag, and lift balances weight.

Step 1 — Identify the horizontal pair: Thrust acts forward and drag acts backward.

Step 2 — State the balance: For constant speed, the thrust must exactly equal the drag.

Why other options are wrong:

- Option A (Lift): a vertical force, balanced by weight, not thrust.
- Option C (Weight): the downward force balanced by lift.
- Option D (Gravity): gravity gives rise to weight, which is balanced by lift, not thrust.

Final Answer: Drag $\Rightarrow$ B

Answer: (B) Go Back to Q29

Q30.

Solution

Concept — Aircraft fuel system: The fuel system stores fuel in the tanks and delivers it to the engines at the correct pressure and flow rate through pumps, valves and lines.

Step 1 — Identify the function needed: Storing fuel and feeding it to the engines under control is required.

Step 2 — Match to the system: This is exactly the role of the fuel system.

Why other options are wrong:

- Option A (Hydraulic system): operates landing gear, flaps and brakes using pressurised fluid.
- Option B (Oxygen system): supplies breathing oxygen at altitude.
- Option C (Electrical system): generates and distributes electrical power.

Final Answer: Fuel system $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q30

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	D	2	B	3	C	4	B	5	D
6	A	7	C	8	B	9	A	10	A
11	D	12	B	13	D	14	C	15	B
16	C	17	D	18	A	19	B	20	C
21	A	22	A	23	B	24	A	25	C
26	D	27	A	28	C	29	B	30	D