

SECTION A (30 MARKS)

1. (a) Aviation Pioneers Matching (4 Marks)

- i. **Montgolfier Brothers** — C. Launched the first successful hot air balloon.
- ii. **Wright Brothers** — D. Achieved the first powered, controlled fixed-wing flight.
- iii. **George Cayley** — B. Known as the "Father of Aviation" for glider principles.
- iv. **Igor Sikorsky** — A. Developed the first practical helicopter (Rotary wing).

1. (b) Lighter-than-air Examples (2 Marks)

Hot air balloons.

Airships/Blimps.

2. Airport Safety Signs and Areas (4 Marks)

- i) **Categories:** Mandatory signs, Prohibition signs, and Information signs.
- ii) **Airside Area:** Runway, Taxiway, or Apron/Ramp.

3. Aviation Weather (True/False) (4 Marks)

- a) **TRUE:** Cirrus clouds are high-altitude ice crystal clouds.
- b) **FALSE:** Humidity affects air density, which impacts engine performance.
- c) **TRUE:** The troposphere is the lowest layer where weather occurs.
- d) **FALSE:** A wind vane measures direction; an anemometer measures speed.

4. Isometric Drawing (4 Marks)

- i) **Definition:** A type of 3D pictorial representation where all three axes are equally inclined to the projection plane.
- ii) **Characteristic:** The axes consist of a vertical line and two lines drawn at 30° to the horizontal.

5. Material Properties (2 Marks)

Physical Properties: Characteristics like density, melting point, or color.

Mechanical Properties: How a material reacts to forces, such as strength, hardness, or ductility.

6. Atmosphere Properties (3 Marks)

- i) **False Statement:** Zawadi (Pressure decreases as altitude increases).

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- ii) **Main Properties:** Temperature, Pressure, Density, or Humidity.

7. Four Forces of Flight (4 Marks)

1. Lift
2. Thrust
3. Weight
4. Drag

8. First Aid Kit Items (3 Marks)

Antiseptic wipes, bandages/dressings, scissors, disposable gloves, or burn ointment.

SECTION B (50 MARKS)

9. (a) Aircraft Components (8 Marks)

i) **Names:** A: Fuselage; B: Wing; C: Empennage (Tail section); D: Landing Gear.

ii) **Functions:**

Wing (B): Generates lift to support the aircraft in flight.

Empennage (C): Provides stability and control (contains the vertical and horizontal stabilizers).

9. (b) Modeling Materials (3 Marks)

Cardboard, wood (balsa or sticks), plastic bottles, or wires.

10. Aviation Communication (9 Marks)

i) **ICAO Phonetics (5Y-KAA):** Five - Yankee - Kilo - Alpha - Alpha.

ii) **Standard Phrases:**

"I have received all...": **ROGER.**

"My transmission is ended...": **OVER.**

iii) **Stop Signal:** Arms crossed above the head in an "X" position.

11. Airport Operations (10 Marks)

a) **Physical Components:** Runway, Taxiway, Terminal, and Ramp.

b) **Categorization:**

- i. Duty-Free Shop: **Landside/Terminal.**
- ii. Aircraft Refueling: **Airside.**
- iii. Car Parking: **Landside.**
- iv. Baggage Handling: **Airside/Terminal.**

c) **KCAA Role:** Regulating safety standards and ensuring airlines/airports compensate consumers for service failures.

12. Aerodynamics (5 Marks)

a) Motions:

- i. Longitudinal Axis: **Rolling**.
- ii. Lateral Axis: **Pitching**.
- iii. Vertical Axis: **Yawing**.

b) **Weight/Gravity:** Weight is the force of gravity pulling the aircraft toward the center of the Earth.

13. Safety and Hazards (8 Marks)

- i) **Hazards:** Flying debris (eye hazard), electric shock (exposed wires), or sharp edges.
- ii) **Precautions:** Wear eye protection (goggles), ensure tools are grounded, or keep the workspace clear.
- iii) **First Aid (Shock):** Break contact with the source (safely), check for breathing, and perform CPR if necessary.

14. Financial Concepts (5 Marks)

- i) **Learner:** Moraa (Budgeting).
- ii) **Profit:** The financial gain made when total revenue exceeds total expenses.
- iii) **Consumer Rights:** Right to safety, right to information, or right to compensation.