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1. Pre-Flight Briefing

Definition: Pre-flight briefing is the provision of meteorological information to the flight crew before departure, covering weather conditions relevant to the planned route and aerodromes.

Briefing for **Low Level flights** and those under **Visual Flight Rules (VFR)** is given up to:

- **FL100** (or up to **FL150** above in mountains)
- Poor visibility — **5000 m or less**
- Any phenomena likely to lower widespread visibility to less than **5000 m**
- Clouds which may affect flight
- SIGMET information

✈ **EXAM TIP — VFR Briefing Ceiling:** "FL100 on plains, FL150 in mountains" — remember: mountains are higher, so briefing ceiling is higher too. Both have the **5000 m** visibility threshold.

2. Oral Briefing

Oral Briefing: Provided when adequate advance notice has *not* been given to the Met Office for preparation of formal documentation.

Notice Requirements

Recipient	Advance Notice Required
AMOs (Aerodrome Met Offices)	3 hours
AMSs (Area Met Services)	12 hours

Where adequate notice has not been given, oral briefing covers all the Met information listed above. Details are recorded in the **Briefing Register** with remarks:

"Briefed Capt/Mr documentation not provided for want of adequate notice" + signature of the crew obtained.

⚠ **Important:** Oral briefings may be **avoided as far as possible**. Formal documentation is always preferred.

3. Flight Documentation — Forms

Flight Documentation is issued as Charts, Tabular, or Cross-section forms, and contains the following:

- (a) Upper Wind and Temperature, Tropopause height, Maximum upper Wind, Jetstream data, Expected en-route WX
- (b) SIGWX phenomena
- (c) METAR, SPECI and TAF of Aerodromes of departure, destination, en-route and alternates; Area/Local Forecast
- (d) Relevant SIGMET, AIREP, Cyclone advisory, VA report

flowchart LR

```
FD["Flight Documentation"] --> A["(a) Upper Wind & Temp\nTropopause Ht\nMax Upper Wind\nJetstream data\nEn-route WX"]
FD --> B["(b) SIGWX Phenomena"]
FD --> C["(c) METAR / SPECI / TAF\nDep / Dest / Enroute / Altn\nArea / Local Forecast"]
FD --> D["(d) SIGMET\nAIREP\nCyclone Advisory\nVA Report"]
```

4. Tabular Form (Met T-3) and Cross Section Form (Met T-4)

Met T-3: Tabular form for flights up to **500 nm**

Met T-4: Cross-section form for flights beyond **500 nm**

Information Provided in Both Forms

#	Content	T-3	T-4
(a)	Synoptic situation and Surface pressure data	✓	✓
(b)	Outlook of en-route weather	✓	✓
(c)	Amount and type of cloud (Pictorially depicted in T-4)	✓	✓ (pictorial)
(d)	Upper winds and temperatures, Height of Freezing Level	✓	✓
(e)	Tropopause data	✓	✓
(f)	Surface visibility (only for flights below FL100)	✓	✓

✈ Mnemonic — T-3 vs T-4:

T-3 = Three hundred (shorter $\leq 500\text{nm}$) → Tabular

T-4 = Four hundred (farther $> 500\text{nm}$) → Cross-section (pictorial clouds)

Distance trigger: **500 nm**

5. Significant En-Route Weather Phenomena

The following are included in Met T-4 and T-3:

Phenomenon	High Level Flights	Low Level Flights
TS (Thunderstorm)	✓	✓
CS (Cumulonimbus)	✓	✓
SQ Line (Squall Line)	✓	✓
Hail	✓	✓
MOD/SEV Turbulence	✓	✓
Icing	✓	✓
FZ Precipitation	✓	✓
Widespread DS/SS	✓	✓
Marked Mountain Waves	✓	✓
Fog, Precipitation reducing visibility $< 5000 \text{ m}$	✗	✓ (additional)

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⚠ **Low Level EXTRA Items:** Fog and Precipitation reducing visibility below **5000 m** are included *only* for Low Level Flights — these are additional to the 9 high-level phenomena.

6. Set of Charts Provided

Flight Type	Charts Provided
International Flights	• SIGWX charts (WAFC forecast) between FL250 and FL630 • Forecast 250 hPa wind and temperature charts
National Flights	• National SIGWX charts • WAFC upper wind and temp. charts • For LL Flights: altitudes 600 , 1500 and 300 m (2000 , 5000 , 10,000 ft)
Fax/Internet NOT available	Met T-3 or Met T-4 form is provided

📌 Key Values:

International SIGWX: **FL250–FL630** | International temp chart: **250 hPa**

National LL altitudes: **600m / 1500m / 3000m = 2000 / 5000 / 10,000 ft**

7. National Significant Weather (SIGWX) Charts

Preparation: All four MWOs prepare SIGWX charts for their respective FIRs and transmit to **MWO Chennai**, which compiles a single national SIGWX chart.

	Thunderstorms		Drizzle
	Tropical cyclone		Rain
	Severe squall line ¹		Snow
	Moderate turbulence		Shower
	Severe turbulence		Widespread blowing snow
	Mountain waves		Severe sand or dust haze
	Moderate aircraft icing		Widespread sandstorm or dust storm
	Severe aircraft icing		Widespread haze
	Widespread fog		Widespread mist
	Hail		Widespread smoke
	Volcanic eruption ²		Freezing precipitation ³
			Visible ash cloud

Symbols for significant weather

	Cold front at the surface		Position, speed and level of max. wind
	Warm front at the surface		Convergence line
	Occluded front at the surface		Freezing level
	Quasi-stationary front at the surface		Intertropical convergence zone
	Tropopause High		State of the sea
	Tropopause Low		Sea-surface temperature
	Tropopause Level		

Wind arrows indicate the maximum wind in the jet and the flight level at which it occurs. Significant changes (speed of 20 knots or more, 3 000 ft (less if practicable) in flight level) are marked by the double bar. In the example, at the double bar the wind speed is 225 km/h – 120 kt.

The heavy line delineating the jet axis begins/ends at the points where a wind speed of 150 km/h – 80 kt is forecast.

Fronts, convergence zones and other chart symbols

LINES AND SYMBOLS ON THE CHART

SPEED OF A FRONT IN KNOTS

SLOW SPEED OF THE FRONT CAN BE DEPICTED IN WORDS

BOUNDARY OF AREA OF SIGNIFICANT WEATHER

— — — BOUNDARY OF AREA OF CLEAR AIR TURBULENCE
THE CAT AREA MAY BE MARKED BY A NUMERAL INSIDE A SQUARE AND A LEGEND DESCRIBING THE NUMBERED CAT AREA MAY BE ENTERED IN A MARGIN

- - - 0° C: FL120 - - - ALTITUDE OF THE 0°C ISOTHERM IN FLIGHT LEVELS

Lines and symbols on a significant weather chart

Chart Levels

Level	Altitude Range	Special Feature
Medium Level	FL100 to FL250	Zero degree isotherm included
High Level	FL250 to FL630	—

Issuance Schedule

Based on Observation Times (UTC)	Issued	Valid for
00, 06, 12, 18 UTC	09 hr after observation time	24 hours

→ SIGWX charts are made **4 times a day**

Contents of National SIGWX Charts

- (a) Tropical Cyclone — wind **34 kt or more**
- (b) CB associated with TS, TC, Line squall, Hail, MOD/SEV Icing and Turbulence, CAT, Marked Mountain Waves, Widespread DS/SS
- (c) Height of Freezing Level, FL of Tropopause
- (d) Location of Volcanic eruption and accidental release of radioactive material significant for air operations
- (e) Jetstream

flowchart TD

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MW01["MWO – Delhi FIR"] --> CH["MWO Chennai\n(compiles single SIGWX)"]
MW02["MWO – Mumbai FIR"] --> CH
MW03["MWO – Kolkata FIR"] --> CH
MW04["MWO – Chennai FIR"] --> CH
CH --> ML["Medium Level\nFL100–FL250\n(0°C isotherm included)"]
CH --> HL["High Level\nFL250–FL630"]
```

📌 Mnemonic — SIGWX Chart Numbers:

4 times/day | based on **00, 06, 12, 18 UTC** | issued **09 hr later** | valid **24 hr**

Tropical Cyclone threshold: **34 kt**

8. Height Indications in Flight Documentation

Conditions	Height Expressed As
En-route Met conditions (e.g. upper winds, turbulence, cloud base/top)	Flight Levels
Aerodrome Met conditions (e.g. cloud base and top)	Above aerodrome elevation

Memory Aid:

En-route → **Flight Levels** (standardised, pressure-based)

Aerodrome → **Above aerodrome elevation** (local reference)

9. In-Flight Met Information (VOLMET)

VOLMET / D-VOLMET: Continuous broadcast of meteorological information for aircraft in flight, transmitted by **Mumbai** and **Kolkata**.

In-Flight Information Provided to Operators / Crew

- METAR, SPECI, TAF, SIGMET, AIREP
- Upper winds and temperature
- VA (Volcanic Ash) and TC advisory

For in-flight planning: Information is supplied to Operators by the Met Office. For aircraft already in-flight, the information above is supplied directly.

10. Quick Revision Summary

CHAPTER 28 — KEY NUMBERS AT A GLANCE

Item	Value
VFR Briefing ceiling (plains)	FL100
VFR Briefing ceiling (mountains)	FL150
Visibility threshold for Low Level briefing	5000 m
AMO advance notice for documentation	3 hours
AMS advance notice for documentation	12 hours
Met T-3 for flights up to	500 nm
Met T-4 for flights beyond	500 nm
International SIGWX chart levels	FL250–FL630
International temp chart pressure level	250 hPa
National SIGWX medium level	FL100–FL250
National SIGWX high level	FL250–FL630
SIGWX chart frequency	4 times/day
SIGWX observation times (UTC)	00, 06, 12, 18
SIGWX issued after observation	09 hours
SIGWX validity	24 hours
Tropical Cyclone wind threshold in SIGWX	34 kt
National LL altitudes	600 / 1500 / 300 m = 2000 / 5000 / 10,000 ft
VOLMET stations (India)	Mumbai and Kolkata
MWO compiling national SIGWX	MWO Chennai

Practice Q&A — Chapter 28

Textbook practice questions.

QUESTION 1

Who prepares National SIGWX Charts?

(a) AMOs (b) WAFC (c) MWOs

✓ CORRECT ANSWER

(c) MWOs — All four MWOs prepare charts for their FIRs and transmit to MWO Chennai, which compiles the national SIGWX chart.

✗ DISTRACTOR ANALYSIS

(a) AMOs — Aerodrome Met Offices handle aerodrome-level reporting, not national SIGWX.
(b) WAFC — WAFC provides international SIGWX (FL250–FL630), not national charts.

📌 INSTRUCTOR'S NOTE

National SIGWX = MWOs → Chennai. International SIGWX = WAFC. This distinction is a favourite exam catch.

QUESTION 2

Flight Level of freezing Level is included in SIGWX Charts.

(a) Medium level charts (b) High level charts (c) Low level charts

✓ CORRECT ANSWER

(a) Medium level charts — The zero degree isotherm (freezing level) is specifically included in the Medium Level SIGWX chart (FL100–FL250).

✗ DISTRACTOR ANALYSIS

(b) High level charts — Above FL250 icing from freezing level is less operationally significant; isotherm not specifically shown.
(c) Low level charts — No specific "low level" SIGWX chart category exists.

📌 INSTRUCTOR'S NOTE

Medium level = FL100–FL250 = icing-relevant altitudes, hence freezing level included.

QUESTION 3

Fog, Precipitation and weather which reduce visibility below 5000 m is considered Significant weather for:

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(a) All level flights (b) High level flights (c) Low level flights

✓ **CORRECT ANSWER**

(c) Low level flights — Fog and poor visibility phenomena are significant only for low-level operations. High-level flights are above such phenomena.

✗ **DISTRACTOR ANALYSIS**

(a) All level flights — Incorrect. These phenomena are not operationally relevant to high-level cruise flight.
(b) High level flights — High-altitude flight is above the cloud/fog layer where 5000m visibility thresholds apply.

📌 **INSTRUCTOR'S NOTE**

Low level gets 2 EXTRA items: Fog + Precipitation reducing viz < 5000m. All others are common to both High and Low.

QUESTION 4

Briefing and Consultation are generally provided to aircrew hours prior to the scheduled departure.

(a) 3 hr (b) 5 hr (c) 6 hr

✓ **CORRECT ANSWER**

(a) 3 hours — Adequate notice to an AMO is 3 hours before departure for documentation preparation.

✗ **DISTRACTOR ANALYSIS**

(b) 5 hr — Not a defined standard. Trap option.
(c) 6 hr — Incorrect. 12 hours applies to AMS (area-level), not individual briefing.

📌 **INSTRUCTOR'S NOTE**

AMO = 3 hr | AMS = 12 hr. The question says "briefing" which is at aerodrome level = AMO = 3 hr.

QUESTION 5

SIGMET information is provided to:

(a) Low level flights (b) All level flights (c) High level flights

✓ **CORRECT ANSWER**

(b) All level flights — SIGMET is part of Flight Documentation and is included in briefing for all flights regardless of level.

✗ **DISTRACTOR ANALYSIS**

- (a) Low level flights only — Incorrect; SIGMETs cover significant meteorological hazards at all levels.
- (c) High level flights only — Incorrect; even low-level flights need SIGMET awareness.

 INSTRUCTOR'S NOTE

SIGMET = for ALL. It is explicitly listed as item (d) in Flight Documentation for all flights.

QUESTION 6

For Low Level flights, and those under Visual Flight Rules, briefing is given up to:

- (a) FL150 or above in mountains (b) FL110 above the sea (c) FL120 or above the plains

 CORRECT ANSWER

(a) FL150 or above in mountains — VFR/low-level briefing ceiling is FL100 on plains, FL150 in mountainous terrain.

 DISTRACTOR ANALYSIS

- (b) FL110 above sea — Not a defined level; trap option mixing up numbers.
(c) FL120 — Not the correct value; FL100 (plains) and FL150 (mountains) are the correct values.

 INSTRUCTOR'S NOTE

Two-part answer: plains = FL100, mountains = FL150. The question tests mountain-specific knowledge.

QUESTION 7

The height indications in Flight Documentation in all en-route Met conditions:

- (a) Above aerodrome elevation (b) Flight Levels (c) As requested by the Pilot

 CORRECT ANSWER

(b) Flight Levels — En-route conditions (upper winds, turbulence, cloud base/top) are expressed in Flight Levels.

 DISTRACTOR ANALYSIS

- (a) Above aerodrome elevation — This applies to aerodrome (local) conditions, not en-route.
(c) As requested by the Pilot — No such provision exists in standard documentation.

 INSTRUCTOR'S NOTE

En-route = Flight Levels | Aerodrome = Above aerodrome elevation. Clean rule, easy marks.

QUESTION 8

The height indications in Flight Documentation in all aerodrome Met conditions:

- (a) Above aerodrome elevation (b) Flight Levels (c) As requested by the Pilot

✅ **CORRECT ANSWER**

(a) Above aerodrome elevation — Cloud base and top at aerodromes are referenced to the local aerodrome elevation.

❌ **DISTRACTOR ANALYSIS**

(b) Flight Levels — Used for en-route, not aerodrome conditions.

(c) As requested by the Pilot — Not a standard.

📌 **INSTRUCTOR'S NOTE**

Complement to Q7. Together they test the en-route vs aerodrome distinction — common MCQ pair.

QUESTION 9

For National Flights the Documents provided are:

(a) National SIGWX charts only (b) WAFC upper wind and temp. charts only (c) Both WAFC upper wind and temp. charts and National SIGWX charts

✅ **CORRECT ANSWER**

(c) Both WAFC upper wind and temp. charts AND National SIGWX charts — National flights receive both document types.

❌ **DISTRACTOR ANALYSIS**

(a) National SIGWX only — Incomplete; WAFC temp/wind charts are also provided.

(b) WAFC charts only — Incomplete; National SIGWX charts are also provided.

📌 **INSTRUCTOR'S NOTE**

National flights = National SIGWX + WAFC charts (both). International = WAFC SIGWX + 250 hPa charts.

Question 10 For National Flights the winds and temperatures are provided for LL Flights for altitudes: (a) 600, 1500 and 3000 m (b) 3000 ft, 5000 ft, 10,000 ft (c) 600, 1000 and 500 m

✅ Answer: (a) 600, 1500 and 3000 m — The levels are 600, 1500 and 3000 m, equivalent to 2000, 5000 and 10,000 ft.

❌ (b) 3000 ft is not one of the levels. (c) has the wrong middle and lower values.

💡 600 / 1500 / 3000 m = 2000 / 5000 / 10,000 ft.

Master Reference Tables

All Numerical Values

Parameter	Value
VFR/LL briefing ceiling — plains	FL100
VFR/LL briefing ceiling — mountains	FL150
Visibility threshold (Low Level/VFR)	5000 m
Advance notice — AMO	3 hours
Advance notice — AMS	12 hours
Met T-3 distance limit	≤ 500 nm
Met T-4 distance limit	> 500 nm
International SIGWX FL range	FL250 - FL630
International temp chart	250 hPa
National SIGWX medium level	FL100 - FL250
National SIGWX high level	FL250 - FL630
SIGWX chart frequency	4 times/day
SIGWX observation times	00, 06, 12, 18 UTC
SIGWX issued after observation	09 hours
SIGWX validity period	24 hours
TC wind threshold in SIGWX	34 kt
National LL altitudes (metres)	300 m, 600 m, 1500 m
National LL altitudes (feet)	2000 ft, 5000 ft, 10,000 ft

Key Mnemonics

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- **T-3 vs T-4:** T-3 = $\leq 500\text{nm}$ (Tabular) | T-4 = $> 500\text{nm}$ (Cross-section with pictorial clouds)
- **Height refs:** En-route $\rightarrow$ FL | Aerodrome $\rightarrow$ Above elevation
- **LL Extra:** Fog + viz $< 5000\text{m}$ = Low Level only (not High Level)
- **Notice:** AMO = 3 hr | AMS = 12 hr
- **SIGWX national:** 4 $\times$ daily, 00/06/12/18 UTC, issued +09hr, valid 24hr
- **SIGWX compiler:** MWO Chennai
- **VOLMET India:** Mumbai + Kolkata

GHOST AVIATOR

Ghost Aviator

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