



**EAST AFRICAN SCHOOL OF AVIATION
EXAMINATION
SAFETY SECTION**

DIPLOMA IN FLIGHT DISPATCH

FLD 39

FINAL EXAMINATION

SUBJECT: AVIATION METEOROLOGY

Duration: 02 Hrs: 30 Min

DAY/DATE:

TIME: 0830HRS – 1030HRS

1. How does the height of the tropopause normally vary with latitude in the northern hemisphere
- A) It remains constant throughout the year
 - B) It decreases from south to north
 - C) It remains constant from north to south
 - D) It increases from south to north
- 1) What is the boundary layer between troposphere and stratosphere called
- A) Tropopause
 - B) Ionosphere
 - C) Stratosphere
 - D) Atmosphere
- 2) The most dangerous form of airframe icing is
- A) clear ice
 - B) hoar frost
 - C) dry ice
 - D) rime ice

- 3) A SPECI is
 - A) an aviation routine weather report
 - B) a warning for special weather phenomena
 - C) a forecast for special weather phenomena
 - D) an aviation selected special weather report
- 4) Which of the following is true of a land breeze
 - A) It blows only at noon
 - B) It blows from land to water
 - C) It blows from water to land
 - D) It blows by day
- 5) The lowest assumed temperature in the International Standard Atmosphere (ISA) is
 - A) -273°C
 - B) -44.7°C
 - C) -100°C
 - D) -56.5°C
- 6) A microburst
 - A) occurs only in tropical areas
 - B) has a diameter up to 4 km
 - C) has a life time of more than 30 minutes
 - D) is always associated with thunderstorms
- 7) What does the abbreviation "nosig" mean
 - A) Not signed by the meteorologist
 - B) No significant changes
 - C) No report received
 - D) No weather related problems
- 8) Vertical wind shear is
 - A) vertical variation in the horizontal wind
 - B) vertical variation in the vertical wind
 - C) horizontal variation in the horizontal wind
 - D) horizontal variation in the vertical wind
- 9) Subsidence is
 - A) vertically upwards motion of air
 - B) the same as convection
 - C) vertically downwards motion of air
 - D) horizontal motion of air
- 10) What are the characteristics of cumuliform clouds
 - A) Small water droplets, instability, turbulence, extensive areas of rain and rime ice
 - B) Large water droplets, instability, turbulence, showers and mainly clear ice
 - C) Small water droplets, stability, no turbulence and extensive areas of rain
 - D) Large water droplets, stability, no turbulence, showers and mainly rime ice
- 11)) In which weather report would you expect to find information about icing conditions on the runway
 - A) GAFOR
 - B) TAF
 - C) METAR
 - D) SIGMET
- 12) What is the most likely temperature at the tropical tropopause
 - A) -55°C

- B) -35°C
 - C) -25°C
 - D) -75°C
- 13) The maximum amount of water vapour that the air can contain depends on the
- A) air temperature
 - B) relative humidity
 - C) stability of the air
 - D) dewpoint
- 14) The most likely reason for radiation fog to dissipate or become low stratus is
- A) an increasingly stable atmosphere
 - B) surface cooling
 - C) a low level temperature inversion
 - D) increasing surface wind speed
- 15) What does the term METAR signify
- A) A METAR is a flight forecast, issued by the meteorological station several times daily
 - B) A METAR is a landing forecast added to the actual weather report as a brief prognostic report
 - C) A METAR signifies the actual weather report at an aerodrome and is generally issued in half-hourly intervals
 - D) A METAR is a warning of dangerous meteorological conditions within a FIR
- 16)) What approximately is the average height of the tropopause over the equator
- A) 16 km
 - B) 8 km
 - C) 11 km
 - D) 40 km
- 17) The approximate inclined plane of a warm front is
- A) 1/150
 - B) 1/50
 - C) 1/300
 - D) 1/500
- 18) What is the approximate speed of a 90 km/h wind expressed in knots
- A) 55 kt
 - B) 60 kt
 - C) 70 kt
 - D) 50 kt
- 19) The cloud base, reported in the METAR is the height above
- A) airfield level
 - B) mean sea level
 - C) the pressure altitude of the observation station at the time of observation
 - D) the highest terrain within a radius of 8 km from the observation station
- 20) During an adiabatic process heat is
- A) Lost
 - B) added but the result is an overall loss
 - C) neither added nor lost
 - D) added
- 21) Wind is caused by
- A) the rotation of the earth
 - B) friction between the air and the ground

- C) the movements of fronts
 - D) horizontal pressure differences
- 22) A mountain breeze (katabatic wind) blows
- A) down the slope during the day
 - B) up the slope during the night
 - C) down the slope during the night
 - D) up the slope during the day
- 23) Convective clouds are formed
- A) in stable atmosphere
 - B) in summer during the day only
 - C) in mid-latitudes only
 - D) in unstable atmosphere
- 24) With what type of cloud is "+TSRA" precipitation most commonly associated
- A) NS
 - B) CB
 - C) AS
 - D) SC
- 25) Which layer of the atmosphere contains more than 90 per cent of all water vapour
- A) Troposphere
 - B) Lower stratosphere
 - C) Upper stratosphere
 - D) Ionosphere
- 26) The validity of a TAF is
- A) 2 hours
 - B) between 6 and 9 hours
 - C) 9 hours from the time of issue
 - D) stated in the TAF
- 27) Which of the following statements is an interpretation of the METAR 0000KT 0200 R14/0800U R16/P1500U FZFG VV001 m03/m03 Q1022 BECMG 0800 =
- A) Meteorological visibility 200 metres, RVR for runway 16 1500 metres temperature -3°C vertical visibility 100 metres
 - B) Meteorological visibility 200 feet RVR for runway 16 more than 1500 metres vertical visibility 100 feet fog with hoar frost
 - C) Meteorological visibility for runway 14 800 metres fog with hoar frost RVR for runway 16 more than 1500 metres
 - D) RVR for runway 14 800 metres vertical visibility 100 feet calm meteorological visibility improving to 800 metres in the next 2 hours
- 28) Runway visual range can be reported in
- A) a METAR
 - B) a TAF
 - C) a SIGMET
 - D) both a TAF and a METAR
- 29) In the mid-latitudes the stratosphere extends on an average from
- A) 85 to more than 200 km
 - B) 11 to 50 km
 - C) 0 to 11 km
 - D) 50 to 85 km
- 30)) In which of the following changes of state is latent heat released

- A) Gas to liquid
 - B) Solid to liquid
 - C) Solid to gas
 - D) Liquid to gas
- 31) What is the approximate composition of the dry air by volume in the troposphere
- A) 50 % oxygen, 40 % nitrogen, and the rest other gasses
 - B) 21 % oxygen, 78 % nitrogen, and the rest other gasses
 - C) 10 % oxygen, 89 % nitrogen, and the rest other gasses
 - D) 88 % oxygen, 9 % nitrogen, and the rest other gasses
- 32) The radiation of the sun heats
- A) the air in the troposphere only directly if no clouds are present
 - B) the surface of the earth, which heats the air in the troposphere
 - C) the air in the troposphere directly
 - D) the water vapour in the air of the troposphere
- 33) For an aircraft what are the meteorological dangers associated with a Harmattan wind
- A) Dust and poor visibility
 - B) Thunderstorms
 - C) Sand up to FL 150
 - D) Hail
- 34) Clear ice is dangerous because it
- A) Is not translucent and forms at the leading edges
 - B) spreads out and contains many air particles
 - C) is heavy and is difficult to remove from the aircraft surfaces
 - D) is translucent and only forms at the leading edges
- 35) You intend to carry out a VFR flight over the Alps on a hot summer day when the weather is unstable What is the best time of day to conduct this flight
- A) Mid-day
 - B) Afternoon
 - C) Early evening
 - D) Morning.
- 36) Which of the following is true concerning atmospheric pressure
- A) It always decreases with height at a rate of 1 hPa per 8m
 - B) It decreases with height
 - C) It is higher in winter than in summer
 - D) It is higher at night than during the day
- 37) Which of the following weather conditions favour the formation of radiation fog
- A) Light wind extensive cloud dry air
 - B) Light wind extensive cloud moist air
 - C) Strong wind little or no cloud moist air
 - D) Light wind little or no cloud moist air
- 38) With which of the following types of cloud is "+RA" precipitation most commonly associated
- A) SC
 - B) ST
 - C) NS
 - D) AC
- 39) The process by which water vapour is transformed directly into ice is known as
- A) Sublimation
 - B) Supercooling

- C) Supersaturation
 - D) radiation cooling
- 40) Why are indications about the height of the tropopause not essential for flight documentation in the tropic
- A) Tropopause informations are of no value
 - B) The tropopause is generally well above the flight level actually flown
 - C) The meteorological services are unable to provide such a chart
 - D) The temperatures of the tropical tropopause are always very cold and therefore not important
- 41) A sample of moist but unsaturated air may become saturated by
- A) expanding it adiabatically
 - B) raising the temperature
 - C) lowering the pressure, keeping temperature constant
 - D) compressing it adiabatically
- 42) Refer to the following TAF extract: BECMG 1821 2000 BKN004 PROB30 BECMG 2124 0500 FG VV001 What does the abbreviation "PROB30" mean
- A) Change expected in less than 30 minutes
 - B) Probability of 30%
 - C) Conditions will last for at least 30 minutes
 - D) The cloud ceiling should lift to 3000 FT
- 43) What is the most important constituent in the atmosphere from a weather standpoint
- A) Carbon dioxide
 - B) Oxygen
 - C) Water vapour
 - D) Methane
- 44) A line drawn on a chart joining places having the same barometric pressure at the same level and at the same time is
- A) an isotherm
 - B) an isallobar
 - C) a contour
 - D) an isobar
- 45) Why does air cool as it rises
- A) It expands
 - B) It contracts
 - C) The air is colder at higher latitudes
 - D) The air is colder at higher altitudes
- 46) Sublimation
- A) solid to vapour
 - B) vapour to liquid
 - C) liquid to vapour
 - D) liquid to solid
- 47) When are thermal lows most likely
- A) Land in summer
 - B) Land in winter
 - C) Sea in summer
 - D) Sea in winter
- 48) Wind is caused by
- A) mixing of fronts

- B) horizontal pressure difference
 - C) earth rotation
 - D) surface friction
- 49) Where do you find the majority of the air within the atmosphere
- A) Troposphere
 - B) Stratosphere
 - C) Tropopause
 - D) Mesosphere

SECTION B (20 marks)

Answer all questions

1. The QNH of an airport at sea level is 983 hPa and the temperature deviation from ISA is -15°C below FL 100. What is the true altitude of FL 100? (5 Marks)
2. You intend to overfly a mountain range. The recommended minimum flight altitude is, according to the aviation chart, 15000 FT/AMSL. The air mass that you will fly through is on average 15°C warmer than the standard atmosphere. The altimeter is set to QNH (1023 hPa). At what altimeter reading will you effectively be at the recommended minimum flight altitude? (5 marks)
3. State and explain the hazards associated with thunderstorms (10 marks)