SOUTH AFRICAN/DGCA ATPL

ENGINES, AIRFRAME & STRUCTURE

Engines that are mounted below the aircrafts wings are attached by:

sub wing spars

pylons

main assemblies

major subframe assemblies

Correct Answer: pylons

For a material which is brittle, choose the correct statement:

It is very weak and will crack when flexed

It is very strong and will not crack when flexed

It is very weak and will not crack when flexed

It is very strong and will crack when flexed

Correct Answer: It is very strong and will crack when flexed

Choose the correct statement for shear pins :

They are designed to resist all normal shear loads that can be applied, but fail at a predetermined level of compressive load

They are designed to resist all normal compression loads that can be applied, but fail at a predetermined level of shear load

They are designed to resist all normal shear loads that can be applied, but fail at a predetermined levels of compression, tension, and torque loading

They are designed to resist all normal compression, tension or combined loads that can be applied, but fail when any shear load is applied

Correct Answer: They are designed to resist all normal compression loads that can be applied, but fail at a predetermined level of shear load

The datum for a BS is:

A vertical plane set along the longitudial axis

A lateral plane set along the longitudial axis

A longitudial plane set along the lateral axis

A horizontal plane set on a vertical axis

Correct Answer: A vertical plane set along the longitudial axis

A material will deform:

when any stress applied is less than the materials elasticisity

when any stress applied exceeds the materials elastic limits

when a tensile stress applied exceeds the materials elastic limits

when a tensile stress applied is less than the materials elasticisity

Correct Answer: when any stress applied exceeds the materials elastic limits

Choose the correct statement:

For panels of equal strength one made of Kevlar would be heavier than the equivilent fibre glass panel

In a monocoque structure bulkheads are the main load bearing structures

By adding magnesium to aluminium the resulting alloy is as strong as mild steel

Doublers are fitted to spread the stress loading

Correct Answer: Doublers are fitted to spread the stress loading

Wing spars are:

Always cantilever in construction

The main load path for the flight loads acting on the wings

Located in the longitudinal plane and form the load path for all the flight loads

Answers a + b are correct

Correct Answer: The main load path for the flight loads acting on the wings

Tail plane flutter will have the following effect :

Always result in oscillations about the lateral axis

Always result in oscillations about the longitudinal axis

Always result in oscillations about the vertical axis

Always result in structural failure in T tailed aircraft

Correct Answer: Always result in oscillations about the lateral axis

Where by the strength of the wing's skin forms part of the wing's supporting structure this is referred to as :

A ridged wing

A reinforced wing

A stressed skin

A mono-skin

Correct Answer: A stressed skin

Choose the correct statement with regard to the stall characteristics of an aircraft with tapered wings:

The stall will begin at the wing root and progress outwards

Affect the whole length of the wing at the same time

The tapered wing will not stall due to its plan form

The stall will start at the tip and progress inwards

Correct Answer: The stall will start at the tip and progress inwards

Choose the correct statement for an empennage:

the thrust stream from the engines dictates the location of the horizontal stabiliser

the horizontal stabiliser must always be in the thrust stream of the engines

the horizontal stabiliser must always be above the thrust stream of the engines

the horizontal stabiliser must always be below the thrust stream of the engines

Correct Answer: the thrust stream from the engines dictates the location of the horizontal stabiliser

The term ventral fin is used to denote:

The fin extention forward of the vertical stabilser

A small fin protruding from the rear underside of the aircraft

A small anhederal fin mounted on or just below the horizontal stabiliser

A small fin mounted on the undersurface of the aircraft forward of the wing rear spar

Correct Answer: A small fin protruding from the rear underside of the aircraft

The datum used for calculating wing stations is:

The vertically from the horizontal centre line

The aircrafts datum

The longitudinal from the lateral centre line

The lateral from the longitudinal centre line

Correct Answer: The lateral from the longitudinal centre line

Bungee cords:

Absorb shock only

Absorb shock and dampen

Dampen only

None of the above

Correct Answer: Absorb shock only

Which is the preferred medium for charging an oleo pneumatic strut?

air

nitrogen

oxygen

CO2

Correct Answer: nitrogen

A modern light twin enginged aircraft with a retractable undercarriage would use as its power source:

An electric motor with direct drive

A self contained power pack

The main hydraulic supply from the aircraft

A hand crank system

Correct Answer: A self contained power pack

An aircraft with a fixed undercarriage has fairings and spats fitted to:

Reduce parasitic drag

Reduce aerodynamic drag

Induced drag

a and b are correct

Correct Answer: Reduce parasitic drag

An aircraft fitted with oleo pneumatic struts taxiing from the stand is found to have insufficient shock absorption. The most likely cause is:

Insufficient gas pressure

Insufficient fluid level

Excessive gas pressure

Excessive fluid level

Correct Answer: Insufficient fluid level

A light aircraft fitted with a tricycle undercarriage which does not have direct steering linkages turns by:

Differential braking only

Castering and nosewheel only

Castering tail wheel and differential braking

Castering nosewheel and differential braking

Correct Answer: Castering nosewheel and differential braking

For a tricycle undercarriage aircraft, for ground manoeuvring the C of G must be located:

Forward of the main wheel axle centre line

Behind the main wheels

Forward of the main wheels

On the main wheel axle centre line

Correct Answer: Forward of the main wheel axle centre line

Before an aircraft may take off brake temperature must be within set limits. Why?

To keep the thermal expansion of the wheels within the limit to fit into the wheel bay.

To prevent the tyres from exploding on take off

To prevent the wheel bearing from seizing on the axle

To ensure that the brakes can absorb the energy of a rejected take-off

Correct Answer: To ensure that the brakes can absorb the energy of a rejected take-off

Fusible plugs are fitted to:

Deflate the tyres at a predetermined pressure

Deflate the tyres at a predetermined temperature

Act as a relief valve and release some of the inflation gas at a predetermined pressure

Act as a relief valve and release some of the inflation gas at a predetermined temperature

Correct Answer: Deflate the tyres at a predetermined temperature

A modern light aircraft would use which of the following braking systems:

Pneumatic drum brakes

Hydraulic drum brakes

Pneumatic disc brakes

Hydraulic single disc brakes

Correct Answer: Hydraulic single disc brakes

In a multi plate disc brake the brake housing is:

Fixed to the landing gear leg

Fixed to the landing gear wheel

Floating and attached to the landing gear leg

Floating and attached to the landing gear wheel

Correct Answer: Floating and attached to the landing gear wheel

For an aircraft fitted with an anti skid system choose the correct statement:

The anti skid system will apply the brakes as soon as the wheels touch down

Landing the aircraft with both pedals depressed, will not cause the brake to be immediately applied

Landing the aircraft with both pedals depressed will cause the tyre to burst

The anti skid system will bring the aircraft to a complete halt without touching the brake pedals

Correct Answer: Landing the aircraft with both pedals depressed, will not cause the brake to be immediately applied

Boosted brake master cylinders are:

Used on low performance light aircraft

Used on high performance heavy air transport aircraft

Used on low performance heavy air transport aircraft

Used on high performance light aircraft

Correct Answer: Used on high performance light aircraft

If an anti skid system on a four wheel bogie senses a skid condition, it:

Releases all the brake pressure from the affected wheel oil

Releases sufficient brake pressure from the affected wheel to allow it to speed up

Releases all the brake pressure from the affected bogie to allow the wheel to speed up to the aircraft speed before re-applying the brakes

Releases sufficient pressure from the wheel brake of that bogie to allow all the wheels to speed up to digest the wheel speed of the bogie.

Correct Answer: Releases sufficient brake pressure from the affected wheel to allow it to speed up

For an aircraft using auto brake if the pilot lands with his feet on the brake pedals which of the following will happen?

All the main wheels will skid as the brakes are pre-applied before touch down

The anti skid system will prevent the auto brake from applying pressure until the wheel speed is above 15 mph

The auto brake will disengage

The anti skid will disengage

Correct Answer: The auto brake will disengage

What is the purpose of the wing main spar:

To withstand bending and torsional loads

To withstand compressive and torsional loads

To withstand compressive and shear loads

To withstand bending and shear loads

Correct Answer: To withstand bending and torsional loads

The aircraft structure must remain substantially intact after:

The design ultimate load times a 1.5 safety factor

The design limit load plus the design ultimate load

Three times the safety factor

The design limit load times a 1.5 factor of safety

Correct Answer: The design limit load times a 1.5 factor of safety

The primary purpose of the fuselage is to :

Support the wings.

House the crew and payload.

Keep out adverse weather.

Provide access to the cockpit.

Correct Answer: House the crew and payload.

Station numbers (Stn) and water lines (WL) are:

A means of locating airframe structure and components

Passenger seat locations

Runway makings for guiding the aircraft to the terminal

Compass alignment markings

Correct Answer: A means of locating airframe structure and components

Control surface flutter:

Provides additional lift for take off and landing in the event of engine failure

Occurs at high angles of attack

Is a destructive vibration that must be damped out within the flight envelope

Is a means of predicting the critical safe life of the wing

Correct Answer: Is a destructive vibration that must be damped out within the flight envelope

Control surface flutter is minimized by:

Reducing the moment of the critical engine

Aerodynamic balance of the control cables

Changing the wings before they reach their critical life

Mass balance of the control surface

Correct Answer: Mass balance of the control surface

The Maximum Zero Fuel Mass (MZFM) of an aircraft is:

The maximum permissible take off mass of the aircraft

The maximum permissible mass of an aircraft with no useable fuel

The maximum permissible mass of an aircraft with zero payload

The maximum permissible landing mass

Correct Answer: The maximum permissible mass of an aircraft with no useable fuel

Pascal's law states that:

pressure is inversely proportional to load

liquid is compressible

oxygen can be used to charge the accumulators.

applied force acts equally in all directions.

Correct Answer: applied force acts equally in all directions.

A pre charge pressure of 1000 bar of gas is shown on the accumulator gauge. The system is then pressurised to 1500 bar, so the accumulator will read:

500 bar

1000 bar

1500 bar

2500 bar

Correct Answer: 1500 bar

The purpose of an accumulator is to:

relieve excess pressure.

store fluid under pressure.

store compressed gas for tyre inflation.

remove air from the system.

Correct Answer: store fluid under pressure.

Low gas pressure in accumulator causes:

rapid jack movements.

no effect on system.

rapid pressure fluctuations while system is operating.

rapid and smooth operation of system.

Correct Answer: rapid pressure fluctuations while system is operating.

Oil is used in an oleo strut to:

Support the weight of the aircraft

Limit the speed of compression of the strut

Lubricate the piston within the cylinder

Limit the speed of extension and compression of the strut

Correct Answer: Limit the speed of extension and compression of the strut

The anti-skid system would be used:

on landing runs only

on take off runs only

for take off on icy runways

for both take off and landing runs

Correct Answer: for both take off and landing runs

Main and nose wheel bays are:

pressurised

unpressurised

conditioned

different, with the mains being unpressurised and the nose pressurised

Correct Answer: unpressurised

For aircraft in level flight if cabin altitude increases; the differential pressure will:

increase

decrease

remain the same

nil

Correct Answer: decrease

In level pressurised flight does the outflow valve:

close

adjust to provide constant flow, and is normally partially open

open to increase air conditioning

adjust to provide constant flow, and is normally almost closed

Correct Answer: adjust to provide constant flow, and is normally partially open

With a gas turbine engine, should engine anti-icing be selected "ON":

whenever the igniters are on.

whenever the IOAT is + 10 ° C or below and the air contains visible moisture.

whenever the TOAT is+ I0° C or below and it is raining.

whenever the ice detector system warning light comes on

Correct Answer: whenever the IOAT is + 10 ° C or below and the air contains visible moisture.

For maximum strength against impact damage pilots windows are:

normally kept to a minimum size.

specially treated during construction.

heated internally to increase their elasticity.

only heated when the IOAT falls below 0° C in precipitation.

Correct Answer: heated internally to increase their elasticity.

Dangerous pressure rise in oxygen cylinders:

is relieved by a thermostat.

is relieved by under pressurising the bottle.

is relieved by a bursting disc.

is controlled by a thermal relief valve.

Correct Answer: is relieved by a bursting disc.

The aircraft cannot be refuelled while:

a ground power unit is operating on the ramp.

passengers are walking through the refuelling zones.

passengers are boarding.

the A.P.U. is running.

Correct Answer: passengers are walking through the refuelling zones.

The disadvantage of refuelling the aircraft to "tanks full" the night before a departure in the heat of the day is that:

the change in the specific gravity may cause the aircraft to be overweight.

the change in the volume of the fuel may cause it to spill through the vent system.

the change in calorific value may reduce engine power to below sufficient.

the R.P.M. governor will be rendered inoperative.

Correct Answer: the change in the volume of the fuel may cause it to spill through the vent system.

If a fuel sample appears cloudy or hazy, the most probable cause is:

water contamination.

anti-microbiological additives.

mixing different fuel grades.

oil in the fuel.

Correct Answer: water contamination.

De-fuelled fuel:

can only be used in domestic heating systems

can only be used by aircraft from the same operators fleet.

must be put back into storage.

cannot be re-used until its quality has been verified.

Correct Answer: cannot be re-used until its quality has been verified.

Fuel is heated:

to stop cavitation in the High Pressure Fuel Pump.

to maintain a constant viscosity.

to prevent water contamination.

to stop ice blocking the Low Pressure fuel filter.

Correct Answer: to stop ice blocking the Low Pressure fuel filter.

RADIO NAVIGATION:

The frequency that corresponds to a wavelength of 6 cm is:

500 KHz

200 MHz

5000 MHz

2000 MHz

Correct Answer: 5000 MHz

A frequency of 7 GHz corresponds to a wavelength of:

43 cm

43 mm

4.3 mm

.43 mm

Correct Answer: 43 mm

The wavelength which corresponds to a frequency of 3000 MHz is:

10 cm

10 mm

1 mm

1 m

Correct Answer: 10 cm

The maximum theoretical range of a DME at 460 ft amsl interrogated by an aircraft at FL 260 is:

228 nm

183 nm

190 nm

137 nm

Correct Answer: 228 nm

A frequency of 295 KHz would be described as:

short wave

LF

MF

HF

Correct Answer: LF

The frequency corresponding to a wavelength of 3.5 cm is:

8.57 MHz

85.7 MHz

857 MHz

8.57 GHz

Correct Answer: 8.57 GHz

A horizontally polarised signal would be best received by an aerial which is:

horizontal

vertical

either horizontal or vertical

plane of aerial doesn’t matter

Correct Answer: horizontal

A VHF signal is transmitted from an aircraft at FL 230. It will first be received by an aircraft at FL 50 when aircraft are:

209 nm apart

222 nm apart

260 nm apart

278 nm apart

Correct Answer: 278 nm apart

A signal with a wavelength of 7360 m lies in the:

VLF band

LF band

MF band

HF band

Correct Answer: LF band

Which situation (surface and frequency) would give the greatest surface wave range?

sea; 110 MHz

desert; 500 KHz

mountains; 1.5 MHz

sea; 500 KHz

Correct Answer: sea; 500 KHz

The frequency that corresponds to a wavelength of 12 cm is:

2500 KHz

360 MHz

2500 MHz

3600 MHz

Correct Answer: 2500 MHz

A maritime reconnaissance a/c receives MAYDAY from surface vessel at a range of 110 nm. The altitude of aircraft is:

230 ft

790 ft

2300 ft

7750 ft

Correct Answer: 7750 ft

Pulse width can be defined as:

The time difference from the start of one radar pulse to the start of the next pulse

The duration of the pulse generally measured in microseconds

The number of pulses per second

The time that the radar is active

Correct Answer: The duration of the pulse generally measured in microseconds

Which of the following is not relevant to secondary radar?

Target must be active

Return signal isn't affected by size, aspect/shape or material make-up of target

Target response can be coded to carry required information

Reflected signal varies according to the size of target

Correct Answer: Reflected signal varies according to the size of target

The PRF of a radar is 1500, what is the PRI:

6.66 microseconds

6666.66 microseconds

666.66 microseconds

66.66 microseconds

Correct Answer: 666.66 microseconds

For a frequency of 50 KHz what is the time taken to complete one cycle?

200 µs

20 µs

2000 µs

2 µs

Correct Answer: 20 µs

A VDF bearing Class A should be accurate to within:

± 2°

± 5°

± 10°

± 20°

Correct Answer: ± 2°

A frequency of 305 KHz would be described as:

Short Wave

LF

MF

HF

Correct Answer: MF

The rate of refraction of a radio wave which occurs within the ionosphere:

Increases as the frequency of the radio wave increases

Decreases as frequency of the radio wave increases

Is constant regardless of the frequency involved

Is greater at night

Correct Answer: Decreases as frequency of the radio wave increases

The rate of attenuation of a radio wave which occurs when the wave travels close to the Earth's surface:

Increases as the frequency of the wave increases, and is greater over the land than the sea

Decreases as the frequency of the wave increases, and is greater over the land than the sea

Increases as the frequency of the wave increases, and is greater over the sea than the land

Decreases as the frequency of the wave increases, and is greater over the sea than the land

Correct Answer: Increases as the frequency of the wave increases, and is greater over the land than the sea

Maximum theoretical range at w/c a VHF signal will be received by a/c flying at FL 200, if transmitter is sited at 860 ft amsl, is:

180 nm

144 nm

170 nm

213 nm

Correct Answer: 213 nm

The frequency which corresponds to a wavelength of 12 mm is:

2.5 MHz

25 MHz

2.5 GHz

25 GHz

Correct Answer: 25 GHz

ICAO recommends that all NDBs normally employ:

NON/A2A

NON/A1A

A3W

A9E

Correct Answer: NON/A2A

The promulgated range for an NDB is applicable:

Day only

Night only

24 hours, but is most prone to error around dusk & dawn

At all times

Correct Answer: Day only

Which of the following statements is true?

primary radar gives range not bearing of a reflected object

secondary radar always measures the bearing of a reflecting object more accurately than primary radar

primary radar uses echoes from a reflecting object, whereas secondary radar uses the response from a transponder

only a secondary radar can be fitted to an aircraft

Correct Answer: primary radar uses echoes from a reflecting object, whereas secondary radar uses the response from a transponder

As a radio signal increases in frequency, ionospheric refraction ___ (i) and atmospheric attenuation ___ (ii):

(i) decreases; (ii) increases

(i) decreases; (ii) decreases

(i) increases; (ii) decreases

(i) increases; (ii) increases

Correct Answer: (i) decreases; (ii) increases

Sky waves are not likely to occur by day or night in which of the following frequency bands?

LF

VHF

MF

HF

Correct Answer: LF

When induced signals from loop & sense antenna are combined in an ADF receiver, resultant polar diagram is called:

a limacon

a cardioid

a figure of eight

circular

Correct Answer: a cardioid

The period for a frequency of 100 KHz is:

100 µsecs

10 µsecs

1000 µsecs

10 ms

Correct Answer: 10 µsecs

With reference to a VDF bearing, the true bearing of the aircraft from the ground station is a:

QDM

QDR

QUJ

QTE

Correct Answer: QTE

It is recommended that broadcast stations should not be used for obtaining loop bearings because:

the classification of emission of a broadcast station is neither N0N/A1A nor N0N/A2A

there may be 2 or more station in same area, operating on same frequency, w/c may cause synchronous Tx error

broadcast stations are liable to interruption of Tx & because there is no failure flag on ADF this could cause gross errors

there may be 2 or more stations operating on same frequency & ADF needle would always point at most powerful one.

Correct Answer: there may be 2 or more station in same area, operating on same frequency, w/c may cause synchronous Tx error

Frequency difference b/n signal transmitted by DME in an aircraft & the reply signal transmitted by the ground station is (i), this difference ensures that

the aircraft receiver does not lock-on to (ii):

(i) 63 GHz; (ii) ground reflected signals

(i) 63 MHz; (ii) interrogation pulses from other aircraft

(i) 63 MHz; (ii) ground reflected signals

(i) 6.3 MHz; (ii) interrogation pulses from other aircraft

Correct Answer: (i) 63 MHz; (ii) ground reflected signals

Which of the following is not a major factor in sky wave propagation?

Power

Terrain

Time of Day

Season of the year

Correct Answer: Terrain

When can an ILS back beam be received?

when flying in the area behind the localiser aerial

never

only at installations where this facility exists

on approach side when displaced more than 35 from runway centreline

Correct Answer: when flying in the area behind the localiser aerial

With reference to a VOR, the cone of confusion is the:

Area outside the DOC

Area directly overhead a VOR

Change over from TO to FROM when OBS is set 90° to radial

Area in which more than one VOR can be received on the same frequency

Correct Answer: Area directly overhead a VOR

If the __ (i) of a radio wave is _____ (ii) then the skip distance will _____ (iii) and the dead space will _____ (iv):

wavelength; increased; increase; increase

frequency; increased; increase; increase

frequency; decreased; increase; decrease

wavelength; decreased; increase; decrease

Correct Answer: frequency; increased; increase; increase

An aircraft on a heading of 270° (M) has 093 set on OBS & TO indicated on VOR L/R deviation indicator. Needle shows 2 dots fly left. A/c is on:

277° radial

089° radial

097° radial

269° radial

Correct Answer: 269° radial

Coastal refraction on an ADF bearing will be increased if the:

beacon is further inland

beacon is nearer the coast

aircraft is further away from the coast

aircraft is nearer the coast

Correct Answer: beacon is further inland

Which of the following factors could cause an error to an ADF bearing?

land/sea bias

tropospheric scatter

scalloping

night effect

Correct Answer: night effect

The principle advantage of Doppler VOR is that:

the effective range is increased

a readout of range as well as bearing is obtained

site errors are considerably reduced

transmitter frequency instability is minimised

Correct Answer: site errors are considerably reduced

Quadrantal error will be a maximum:

during the period around dawn to dusk

when St Elmo's fire is present

on true bearings from beacon of 045°, 135°, 225° & 315°

on relative bearings of 045°, 135°, 225° and 315°

Correct Answer: on relative bearings of 045°, 135°, 225° and 315°

A VDF bearing class C should be accurate to within:

± 2°

± 5°

± 10°

10°

Correct Answer: ± 10°

When the identification code TST is received from a navigational aid, this indicates:

the identification of the beacon

that the beacon is on test

that beacon errors may be more than 5°

that the beacon has gone to a standby mode

Correct Answer: that the beacon is on test

The basic principle of operation of the VOR is by:

phase comparison between a 30 Hz reference signal and a 30 Hz variable signal

pulse difference between a 30 Hz reference signal and a 30 Hz variable signal

phase comparison between a 63 Hz reference signal and a 63 Hz variable signal

phase comparison between a 30 Hz reference signal and a 63 Hz variable signal.

Correct Answer: phase comparison between a 30 Hz reference signal and a 30 Hz variable signal

An aircraft is on a bearing of 263°(M) from a VOR station. If the OBI is set to 091, the deviation indicator will show:

FROM & fly right 4 dots

FROM and fly left 4 dots

TO and fly left 4 dots

TO & fly right 4 dots

Correct Answer: TO and fly left 4 dots

DME uses:

primary radar

secondary radar

primary radar from ground & secondary radar from a/c

primary radar from a/c & secondary radar from ground

Correct Answer: secondary radar

An aircraft DME receiver does not lock on to signals that are reflected from the ground because:

DME uses the UHF band

DME transmits twin pulses

the pulse recurrence rate is varied

reflections will not be at correct frequency for receiver

Correct Answer: reflections will not be at correct frequency for receiver

The accuracy of DME at 100 nm slant range is within:

1 nm

1.5 nm

3 nm

4 nm

Correct Answer: 1.5 nm

How many aircraft can a DME respond to simultaneously?

50

100

150

none of the above

Correct Answer: 100

When a VOR is selected, the morse identifier codes PSV. The DME morse identifier codes PSZ. This means that the:

two aids are associated & aerials are less than 2000 ft apart

two aids are co-located and can be used for an airfield approach

two transmitter aerials do not meet the co-location criteria

two aerials ain't associated with each other but do meet co-location criteria

Correct Answer: two transmitter aerials do not meet the co-location criteria

For an ILS with 3° glidepath approximate angles of lower & upper useable vertical coverage & first false glidepath are:

Lower Useable: 1.35°; Upper Usable: 5.25°; First False Glidepath 10°

Lower Useable: 1.35°; Upper Usable: 5.25°; First False Glidepath 6°

Lower Useable: 2°; Upper Usable: 6°; First False Glidepath 9°

Lower Useable: 2°; Upper Usable: 5°; First False Glidepath 6°

Correct Answer: Lower Useable: 1.35°; Upper Usable: 5.25°; First False Glidepath 6°

ILS glidepath coverage, in extends to a range of 10 nm and:

8° either side of the centre line

10° either side of the centre line

15° either side of the centre line

35° either side of the centre line

Correct Answer: 8° either side of the centre line

Category I ILS provides accurate guidance to:

50 ft above the horizontal plane containing the threshold

100 ft above the horizontal plane containing threshold

200 ft above the horizontal plane containing the threshold

250 ft above the horizontal plane containing threshold

Correct Answer: 250 ft above the horizontal plane containing threshold

With reference to DME, time interval between aircraft transmission & the reply pulse is 200 µsecs. The slant range is:

16 .6 nm

12.5 nm

8.3 nm

6.1 nm

Correct Answer: 12.5 nm

You are flying an aircraft on a heading of 280° (M) and on a bearing of 090° (M) from a VOR. The bearing you should select on the omni-bearing selector in

order to centralise the deviation needle with TO showing is:

280°

270°

100°

090°

Correct Answer: 270°

A/c is following ILS glidepath of 3°, OM is 4.2 nm from ILS touchdown point. If approach speed is 130 kt, height of a/c at outer marker should be:

910 ft

960 ft

1300 ft

1390 ft

Correct Answer: 1300 ft

Fading of an ADF signal, together with a hunting needle, is an indication of:

mountain effect

quadrantal error

thunderstorm effect

night effect

Correct Answer: night effect

For reliable navigational information the approximate coverage of a 3° glideslope is:

1.35° to 5.25° from horizontal & 8° either side of localizer

0.45° from horizontal to 1.75° above glidepath & 8° either side of localiser

0.7° above & below glidepath & 8° either side of localizer

3° above & below the glidepath & 10° either side of the localiser

Correct Answer: 1.35° to 5.25° from horizontal & 8° either side of localizer

DME is a _____ (i) radar operating in the _____ (ii) band and transmits _____ (iii):

(i) primary; (ii) SHF; (iii) CW pulses

(i) secondary; (ii) UHF; (iii) pulse pairs

(i) secondary; (ii) SHF; (iii) 2400 pulse pairs per second

(i) primary; (ii) UHF; (iii) pulse pairs

Correct Answer: (i) secondary; (ii) UHF; (iii) pulse pairs

Referring to DME, during the search pattern before "lock-on":

the airborne receiver checks 150 pulse pairs per second

the airborne transmitter transmits 150 pulse pairs per second

the ground receiver maintains the ground transmitter pulse pair transmission rate at no more than 150 per second

the aircraft transmits 24 pulse pairs per second and the receiver checks a maximum of 150 pulse pairs per second

Correct Answer: the airborne transmitter transmits 150 pulse pairs per second

DME in an aircraft flying at FL 390 indicates 15 nm. Approximate horizontal distance of aircraft from DME station is:

11.5 nm

12.5 nm

13.5 nm

14.5 nm

Correct Answer: 13.5 nm

The ILS localiser uses frequencies in the _____ (i) band and the glideslope uses frequencies in the _____ (ii) band:

(i) UHF; (ii) VHF

(i) VHF; (ii) UHF

(i) VHF; (ii) HF

(i) UHF; (ii) SHF

Correct Answer: (i) VHF; (ii) UHF

The approximate width of the cone of confusion at 15 000 ft overhead a VOR beacon should not be greater than:

6 nm

4 nm

2 nm

1 nm

Correct Answer: 6 nm

Aircraft at 6000 amsl is tuned to a VOR at 240 amsl. If no other factors are involved, maximum range at w/c signal could be detected is:

151 nm

116 nm

151 km

116 km

Correct Answer: 116 nm

ILS localiser gives coverage out to a range of 17 nm on either side of the centre line through an angle of:

8°

10°

15°

35°

Correct Answer: 35°

A radio aid has a wavelength of 2.4 m. The frequency is:

12.5 MHz

125 MHz

720 MHz

72 MHz

Correct Answer: 125 MHz

In an ADF system, night effect is most pronounced:

during long winter nights

when aircraft is at low altitude

when aircraft is at high altitude

at dusk and dawn

Correct Answer: at dusk and dawn

Which of the following does not have a system to warn the pilot that it is inoperative?

ADF

ILS

DME

VOR

Correct Answer: ADF

During maintenance, malfunction or testing the identification signal of a VOR transmitter is __ (i) by __ (ii) or __ (iii):

(i) suppressed; (ii) a continuous tone; (iii) removed

(i) replaced; (ii) a continuous tone; (iii) morse letter S

(i) suppressed; (ii) a modulated tone; (iii) suppression

(i) removed; (ii) an antiphase signal; (iii) suppression

Correct Answer: (i) suppressed; (ii) a continuous tone; (iii) removed

Time interval between transmission of DME interrogation pulse & reception of response pulse is 2 milliseconds. The slant range is:

300 km

81 nm

60 nm

162 km

Correct Answer: 300 km

If the PRF of a transmitter is stated as 500, the corresponding PRI is:

2 picoseconds

2 nanoseconds

2 microseconds

2 milliseconds

Correct Answer: 2 milliseconds

The modulation technique for ILS is _____ (i), and a typical localiser frequency is _____ (ii):

A9W; 329.30 MHz

A8W; 110.30 MHz

A9W; 110.70 MHz

A8W; 118.30 MHz

Correct Answer: A8W; 110.30 MHz

ILS localisers with normal angle glidepath transmitter provide coverage to a range of __ (i) within __ (ii) degrees of centre line:

(i) 10 nm; (ii) 35°

(i) 25 nm; (ii) 25°

(i) 25 nm; (ii) 10°

(i) 35 nm; (ii) 8°

Correct Answer: (i) 25 nm; (ii) 10°

Which of the following statements is incorrect with regard to circular polarisation?

it is frequently used for satellite communications

it is used to effect long range communication with submerged submarines

it is used to improve reception of VHF radio in motor cars

it may be used to reduce radar interference from rain bearing clouds

Correct Answer: it is used to effect long range communication with submerged submarines

An aircraft is at FL290, with AWR stabilised to the horizontal and in the weather mode (beam width 4°). A cloud is seen on the radar at 35 nm. Using the tilt

control the paint on the screen goes at 5° up. Approximate altitude of the cloud top is:

17 500 ft

39 500 ft

46 500 ft

10 500 ft

Correct Answer: 39 500 ft

A frequency commonly used for AWR is ___ (i), which has a wavelength of ___ (ii) and lies in the ___ (iii) band:

9375 GHz; 3.2 mm; EHF

9375 MHz; 3.2 cm; SHF

9375 KHz; 3.2 cm; SHF

940 KHz; 32 cm; UHF

Correct Answer: 9375 MHz; 3.2 cm; SHF

An aircraft is overflying a VOR at 30000ft, groundspeed of 300 kt. Maximum time during which no usable signals will be received (in min. & sec.) is:

1:40

2:20

4:39

0:50

Correct Answer: 2:20

The middle marker of an ILS installation identifies itself with:

alternating dots and dashes with an amber light

continuous dots with a white light

continuous dashes with an amber light

alternating dots and dashes with a white light

Correct Answer: alternating dots and dashes with an amber light

An aircraft takes-off at dusk to fly a westerly route. Frequencies that should be used for HF communication to stations ahead of & behind a/c are

A - 5MHz; B - 10MHz

A - 10MHz; B - 10MHz

A - 5MHz; B - 5MHz

A - 10MHz; B - 5MHz

Correct Answer: A - 10MHz; B - 5MHz

A typical ILS glidepath frequency, in MHz, is:

329.3

110.3

110.45

75

Correct Answer: 329.3

A primary radar has a PRF of 500 pps. The maximum theoretical unambiguous range, ignoring all other factors, is:

300 nm

162 nm

600 nm

324 nm

Correct Answer: 162 nm

VLF surface waves achieve greater range than LF surface waves because:

VLF diffraction is greater and attenuation is less

VLF diffraction and attenuation are less

VLF diffraction is less and attenuation is greater

VLF diffraction and attenuation are greater

Correct Answer: VLF diffraction is greater and attenuation is less

The ILS outer marker transmits on a frequency of _____ and is identified by an aural signal of _____:

75 MHz; 2 dashes per second

75 KHz; alternate dots and dashes

75 MHz; alternate dots and dashes

75 KHz; 2 dashes per second

Correct Answer: 75 MHz; 2 dashes per second

When using an AWR to obtain a fix from ground, the pencil beam is used in preference to mapping beam because:

the wider beam gives better definition of ground features

angle of tilt is restricted in mapping mode

at ranges over 50–70nm greater power can be concentrated in beam

it overcomes the problem of hill shadows

Correct Answer: at ranges over 50–70nm greater power can be concentrated in beam

The rate of descent in feet per minute, appropriate to a 3.2° ILS glidepath at an approach groundspeed of 110 kts is:

553 fpm

586 fpm

620 fpm

658 fpm

Correct Answer: 586 fpm

Reference to Doppler under what circumstances will there be increase in frequency proportional to transmitter velocity:

the transmitter and receiver moving towards each other

the transmitter moving towards the receiver

the receiver moving towards the transmitter

the transmitter moving away from the receiver

Correct Answer: the transmitter moving towards the receiver

Doppler Sea Bias effect

Due to the surface movement of the sea and is corrected by the Land/Sea switch

Returning echoes being biased towards the vertical, causing the doppler shift to be measured to high

Returning echoes being biased towards the vertical and reducing the doppler shift measured

The system unlocking over a very smooth sea and going into the memory mode automatically

Correct Answer: Returning echoes being biased towards the vertical and reducing the doppler shift measured

In an ILS installation the accurate coverage of the glidepath signals in azimuth is:

8° either side of the centre line out to a distance of 10 nm

10° either side of centre line out to a distance of 8 nm

35 ° either side of the centre line out to a distance of 17 nm

17° either side of centre line out to a distance of 35nm

Correct Answer: 8° either side of the centre line out to a distance of 10 nm

Aircraft heading 140°(M) bears 320°(T) from VOR (VAR 10°E). OBS selection to make CDI center with "TO" is?

140°

130°

310°

320°

Correct Answer: 130°

Aircraft heading of 270°(M) has 093 set on OBS & "TO" indicated on VOR L/R deviation indicator. With needle showing 2 dots fly left a/c is on:

277° radial

089° radial

097° radial

269° radial

Correct Answer: 269° radial

Attenuation of a radio wave is the:

change of its amplitude by use of side bands

change of its frequency by use of side bands

reduction of its power by absorption, scattering or dispersion

increase of its power by absorption, scattering or dispersion

Correct Answer: reduction of its power by absorption, scattering or dispersion

Category I ILS is certificated to:

100ft radio altimeter height

200ft radio altimeter height

250ft barometric height

200ft barometric height

Correct Answer: 200ft barometric height

Which of the following statements concerning the ILS localiser is correct?

the beam is reliable up to 35° from the centreline at a range of 25 nnm

reverse course signals may be obtained within 35° of the centreline on the approach side of the ILS

ATC is responsible for keeping large a/c at a safe distance from a Category III installation in use in minimum conditions

the localiser signals can be used for a back beam on any approach

Correct Answer: ATC is responsible for keeping large a/c at a safe distance from a Category III installation in use in minimum conditions

The frequency which corresponds to a wavelength of 12 cm is:

2500 KHz

360 MHz

2500 MHz

3600 MHz

Correct Answer: 2500 MHz

The ILS glidepath operates between:

108-112MHz in VHF

329.3-335 MHz in UHF

108-112MHz in UHF

329.3-335MHz in VHF

Correct Answer: 329.3-335 MHz in UHF

When using the ILS, a false glidepath is _____ :

always found above the real glidepath

always found below the real glidepath

found both above and below the real glidepath

not found in UK as clearance pattern is transmitted over glidepath pattern

Correct Answer: found both above and below the real glidepath

The essential difference between a primary radar and a secondary radar system is that:

Primary radar is ground based, whereas a secondary radar is an airborne system

Primary radar is pulsed, whereas a secondary radar uses CW techniques

Primary radar relies on target reflection, secondary radar relies on transponder at target to generate reply pulse/pulses

Primary radar is limited to line of sight, whereas a secondary radar is not

Correct Answer: Primary radar relies on target reflection, secondary radar relies on transponder at target to generate reply pulse/pulses

If a primary radar has a pulse width of 1.5 microseconds and a PRF of 809 it will have a Minimum and a Maximum range of:

200 nm - 0.25 nm

100 nm - 0.12 nm

0.25 nm - 200 nm

0.12 nm - 100 nm

Correct Answer: 0.12 nm - 100 nm

For a given HF frequency skip distance will normally:

have no diurnal variation

be greater by night than by day

be greater by day than by night

be less by night than by day

Correct Answer: be greater by night than by day

When would VDF be used for a position fix:

When an aircraft declares an emergency on any frequency.

When first talking to a FIR on crossing an international boundary.

When joining controlled airspace from uncontrolled airspace

When declaring an emergency on 121.500 MHz.

Correct Answer: When declaring an emergency on 121.500 MHz.

In a hyperbolic navigation system, accuracy will be greatest:

Along the base line extension

Along the base line

Along the right bisector of the base line

Within 30 nm radius of either station

Correct Answer: Along the base line

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An aircraft heading 320°(M) bears 320°(T) from VOR (VAR 10°E). w/c bearing on OBS would make CDI to show "TO":

140°

130°

310°

320°

Correct Answer: 130°

Aircraft heading 270°(M) has 273 set on OBS with "TO" indicated. With needle showing 2 dots fly left a/c is situated on:

277° radial

089° radial

097° radial

269° radial

Correct Answer: 089° radial

Category II ILS is certificated down to:

100 ft radio altimeter height

200 ft radio altimeter height

250 ft barometric height

200 ft barometric height

Correct Answer: 100 ft radio altimeter height

The definition of a hyperbolic position line is: “a line joining points of equal....”

phase from 2 transmitters

distance from 2 transmitter

reception strength

difference in distance from 2 locations

Correct Answer: difference in distance from 2 locations

Which of the following is an advantage of VDF:

no equipment required in the aircraft

no special equipment required in a/c or on the ground

only a VHF radio is needed in the aircraft

it is pilot interpreted, so ATC is not required

Correct Answer: only a VHF radio is needed in the aircraft

A/c at 25000 ft equipped with AWR having beam width of 5°. Tilt 3.5° up, when cloud at 105 nm just disappears from screen. Height of cloud is:

14 300 ft

35 150 ft

35 500 ft

25 000 ft

Correct Answer: 35 500 ft

A NDB transmits a signal pattern which is:

A 30 Hz polar diagram

Omni-directional

A bi-Iobal pattern

Beam rotating at 30Hz

Correct Answer: Omni-directional

A pilot wishes to obtain magnetic bearing of his aircraft from a VDF station. Which of following terms would he use?

QDM

QDR

QTE

QGH

Correct Answer: QDR