FLIGHT DISPATCH 24 FINAL EXAM

PART A (50 MARKS)

1) When Mode C is selected on the aircraft SSR transponder the additional information transmitted is:

A altitude based on regional QNH

B aircraft height based on sub-scale setting

C height based on QFE

D flight level based on 1013.25 hPa

2) ILS is subject to false glide paths resulting from:

A spurious signals reflected by nearby obstacles

B back-scattering of antennas

C ground returns ahead of the antennas

D multiple lobes of radiation patterns in the vertical plane

3) Which of the following radar equipments operate by means of the pulse technique?

1. Aerodrome Surface Movement Radar

2. Airborne Weather Radar

3. Secondary Surveillance Radar (SSR)

4. Aerodrome Surveillance (approach) Radar

A 2, 3 and 4 only

B 2 and 4 only

C 1, 2, 3 and 4

D 1, 2 and 4 only

4) Outer marker transmits on 75 MHz and has an aural frequency of:

A 1300 Hz B 2000 Hz C 3000 Hz D 400 Hz

5) What airborne equipment, if any, is required to be fitted in order that a VDF let-down may be flown?

A VOR/DME B VHF radio C VOR D none

6) Which combination of characteristics gives best screen picture in a primary search radar?

A long pulse length and wide beam

B long pulse length and narrow beam

C short pulse length and wide beam

D short pulse length and narrow beam

7) The VOR system is limited to about 1° of accuracy. One degree at 200 NM represents a width of:

A 2.5 NM B 3.0 NM C 3.5 NM D 2.0 NM

8) Assuming a five dot display, what does each of the dots on either side of the ILS localizer cockpit display represent :

A 1.5 degrees B 2.5 degrees C 2.0 degrees D 0.5 degrees

9) An aircraft at 6400 FT will be able to receive a VOR groundstation at 100 FT above MSL at an approximate maximum range of :

A 110 NM B 90 NM C 100 NM D 120 NM

10) What is the maximum number of usable Secondary Surveillance Radar (SSR) transponder codes?

A 760 B 4096 C 3600 D 1000

11) In an Airborne Weather Radar that has a colour cathode ray tube (CRT) increasing severity of rain and turbulence is generally shown by a change of colour from:

A green to red to black

B yellow to orange to red

C green to yellow to red

D yellow to amber to blue

12) What approximate rate of descent is required in order to maintain a 3° glide path at a groundspeed of 120 kt?

A 950 FT/MIN B 600 FT/MIN C 550 FT/MIN D 800 FT/MIN

13) The reason why pre take-off holding areas are sometimes further from the active runway when ILS

Category 2 and 3 landing procedures are in progress than during good weather operations is:

A aircraft manoeuvring near the runway may disturb guidance signals

B heavy precipitation may disturb guidance signals

C to increase distance from the runway during offset approach operations

D to increase aircraft separation in very reduced visibility conditions

14) Which of the following is an ILS localiser frequency?

A 109.15 MHz B 108.25 MHz C 110.20 MHz D 112.10 MHz

15) An RMI slaved to a remote indicating compass has gone unserviceable and is locked on to a reading of 090°. The tail of the VOR pointer shows 135°. The available information from the VOR is:

A Radial 315°, relative bearing unknown

B Radial 135°, relative bearing unknown

C Radial unknown, relative bearing 225°

D Radial unknown, relative bearing 045°

16) Ignoring pulse length, the maximum pulse repetition frequency (PRF) that can be used by a primary radar facility to detect targets unambiguously to a range of 200 NM is: (pps = pulses per second)

A 375 pps B 405 pps C 782 pps D 308 pps

17) Which of the following Secondary Surveillance Radar (SSR) codes is used to indicate transponder malfunction?

A 4096 B 9999 C 0000 D 7600

18) Due to 'Doppler' effect an apparent decrease in the transmitted frequency, which is proportional to the transmitter's velocity, will occur when:

A the transmitter moves away from the reciever

B the transmitter and receiver move towards each other

C the transmitter moves toward the reciever

D both transmitter and receiver move away from each other

19) Which one of the following statements is correct concerning the use in primary radar of continuous wave transmissions as compared with pulse transmissions?

A The equipment required is more complex in continuous wave radar but this is offset by greater reliability and accuracy

B It eliminates the minimum target reception range

C A smaller common transmitter and receiver aerial can be used

D It is less effective in short range radars but more effective in long range radars

20) In order to ascertain whether a cloud return on an Aircraft Weather Radar (AWR) is at or above the height of the aircaft, the tilt control should be set to: (Assume a beam width of 5°)

A 2.5° down B 5° up C 2.5° up D 0°

21) Which of the following is an advantage of Ground/DF (VDF) let-down?

A It is pilot interpreted and does not require the assistance of ATC

B It does not require any special equipment to be fitted to the aircraft

C It does not require any special equipment, apart from a VHF radio, to be installed in the aircraft or on the ground

D It only requires a VHF radio to be fitted to the aircraft

22) In order to indicate radio failure the aircraft SSR transponder should be selected to code:

A 7700 B 7000 C 7500 D 7600

23) The maximum range of primary radar depends on :

A frequency

B pulse length

C pulse recurrence frequency

D wave length

24) The maximum range obtainable from an ATC Long Range Surveillance Radar is approximately:

A 400 NM B 300 NM C 200 NM D 100 NM

25) In relation to radar systems that use pulse technology, the term 'Pulse Recurrence Rate (PRR)' signifies the:

A ratio of pulse period to pulse width

B number of pulses per second

C delay after which the process re-starts

D the number of cycles per second

26) In order to plot a bearing from a VOR station, a pilot needs to know the magnetic variation

A at the VOR

B at the aircraft location

C at the half-way point between the aircraft and the station

D at both the VOR and aircraft

27) A frequency of 10 GHz is considered to be the optimum for use in an airborne weather radar system because:

A static interference is minimised

B less power output is required in the mapping mode

C the larger water droplets will give good echoes and the antenna can be kept relatively small

D greater detail can be obtained at the more distant ranges of the smaller water droplets

28) An aircraft on a heading of 280°(M) is on a bearing of 090°(M) from a VOR. The bearing you should select on the OMNI bearing selector to centralise the VOR/ILS left/right deviation needle with a 'TO' indication is:

A 280° B 270° C 090° D 100°

29) In general the operation of airborne weather radar equipment on the ground is:

A only permitted with certain precautions, to safeguard health of personnel and to protect equipment

B permitted anywhere

C totally prohibited

D unrestrictedly permitted in aerodrome maintenance areas

30) In which frequency band do VOR transmitters operate?

A SHF B EHF C VHF D UHF

31) An aircraft carrying out an ILS approach is receiving more 90 Hz than 150 Hz modulation notes from both the localiser and glidepath transmitters. The ILS indication will show:

A Fly left and fly up

B Fly right and fly down

C Fly left and fly down

D Fly right and fly up

32) The two main design functions of Secondary Surveillance Radar (SSR) Mode S are:

A air to ground and ground to air data link communications and improved ATC aircraft surveillance capability

B collision avoidance using TCAS II and improved long range (HF) communication capability.

C continuous automatic position reporting using Global Positioning System (GPS) satellites and collision avoidance using TCAS II

D the elimination of ground to air communications and the introduction of automatic separation between aircraft using TCAS II

33) A ground radar transmitting at a PRF of 1200 pulses/second will have a maximum unambiguous range of approximately:

A 67 NM B 135 NM C 270 NM D 27 NM

34) The azimuth transmitter of a Microwave Landing System (MLS) provides a fan-shaped horizontal approach zone which is usually:

A + or - 30° of the runway centre-line

B + or - 40° of the runway centre-line

C + or - 50° of the runway centre-line

D + or - 60° of the runway centre-line

35) The selection of code 2000 on an aircraft SSR transponder indicates:

A entry into airspace from an area where SSR operation has not been required

B unlawful interference with the planned operation of the flight

C an emergency

D transponder malfunction

36) Which of the following is the ICAO allocated frequency band for ADF receivers?

A 200 - 2000 kHz

B 200 - 1750 kHz

C 255 - 455 kHz

D 300 - 3000 kHz

37) Which one of the following is an advantage of a Microwave Landing System (MLS) compared with an Instrument Landing System (ILS)?

A The installation does not require to have a separate method (marker beacons or DME) to determine range

B There is no restriction on the number of ground installations that can be operated because there is an unlimited number of frequency channels available

C It is insensitive to geographical site and can be installed at sites where it is not possible to use an ILS

D It does not require a separate azimuth (localiser) and elevation (azimuth) transmitter

38) The Doppler Navigation System is based on:

A radar principles using frequency shift

B radio waves refraction in the ionosphere

C doppler VOR (DVOR) Navigation System

D phase comparison from ground station transmissions

39) Given : Compass heading 270° Deviation 2°W Variation 30°E Relative bearing 316° What is the QDR?

A 044° B 226° C 046° D 224°

40) An apparent increase in the transmitted frequency which is proportional to the transmitter velocity will occur when:

A the transmitter moves away from the receiver

B the receiver moves towards the transmitter

C both transmitter and receiver move towards each other

D the transmitter moves towards the receiver

41) Which one of the following switch positions should be used when selecting a code on the Transponder?

A IDENT (Identification)

B NORMAL

C OFF

D STBY (Standby)

42) In a primary radar using pulse technique, the ability to discriminate between targets in azimuth is a factor of:

A beam width

B aerial rotation rate

C Pulse Recurrence Rate (PRR)

D pulse length

43) An aircraft carrying out a 3° glidepath ILS approach experiences a reduction in groundspeed from 150 kt at the outer marker to 120 kt over the threshold. The effect of this change in groundspeed on the aircraft's rate of descent will be a decrease of approximately:

A 100 FT/MIN B 150 FT/MIN C 250 FT/MIN D 50 FT/MIN

44) Which of the following is likely to have the greatest effect on ADF accuracy?

A Interference from other NDBs, particularly at night

B Frequency drift at the ground station

C Interference from other NDBs, particularly during the day

D Mutual interference between aircraft aerials

45) A VOR is sited at position A (45°00'N, 010°00'E). An aircraft is located at position B (44°00'N, 010°00'E). Assuming that the magnetic variation at A is 10°W and at B is 15°W, the aircraft is on VOR radial:

A 195° B 185° C 180° D 190°

46. The propagation of sky waves is largely influenced by

a) The time of day

b) Atmospheric attenuation

c) The earth’s rotation

47. With HF sky waves skip distance

a) Increases with an increase in frequency

b) Increases with a decrease in frequency

d) Is constant for any frequency

48. With frequency modulated transmissions

a) The frequency is constant and the amplitude is varies

b) Both the frequency and amplitude vary

c) The amplitude is constant and the frequency varies

49. Ground wave attenuation is greatest on

a) VLF

b) MF

c) HF

50. The critical angle of a radio wave

a) Varies with frequency

b) Varies with phase angle

c) Is constant for all frequencies

PART B (20 MARKS)

51. State five applications of Radars (5marks)

52. Describe what's meant by (4 marks)

a. Amplitude modulation

b. Frequency modulation

c. Phase modulation

d. Pulse modulation

53. Given the wave length of a signal to be 1515m, calculate the corresponding frequency (1 mark)

54. The relative speed between a transmitter on ground and a receiver in the aircraft is 300 m/s, the wavelength of the transmission is 2 cm, calculate the frequency shift in khz (5marks).