FLIGHT PLANNING
FINAL EXAMINATIONS
FDS24

PART 1
(40MKS)

1. A Piston aircraft has a taxi fuel of 280 kgs and a trip fuel of 8,500kgs, alternate fuel 3,680kgs, and hold fuel flow rate of 4800kgs/hr, what is the required take off fuel?

   (5mks)

2. An aircraft has a total fuel load of 8,100kgs, the average fuel flow is 900kgs /hr, TAS 350kts, wind component out 50kts headwind and wind component on return is 30kts tailwind, what is the distance to the point of no return if reserves of 900kgs are kept?

   (5mks)

3. An aircraft is to fly from A-B a distance of 2,800nm(ngm)using LRC at F310,
   Given: aircraft mass at "A" 64,800kgs
   OAT: -29˚C
   Wind component: 26 kts tailwind
   Calculate TAS and the fuel required. 5mks)

4. The total distance from A-B is 4500nm, the aircraft average TAS is 240 kts, the wind component out is 40kts tailwind, the wind component remains constant, if the actual time of departure is 0745Z, calculate the distance to the point of equal time and the expected time of arrival at PET.
   (5mks)

5. An aircraft is to maintain an average TAS of 250 kts, the distance to go is 2,400nm, the wind component out is 70 kts tailwind and the wind component home is 40kts head wind, calculate the distance to the critical point if the aircraft performance is degraded by 35% having lost a critical engine. (5mks)

6. An aircraft was over Q at 1320 hours flying direct to R

   Distance Q to R is 3016nm
   TAS 480kts
   W/c out 90 kts headwind
   W/c home 75kts tailwind
   The Estimated time of arrival for reaching point of equal time between **Q** and **R** is? (5MKS)

7. Calculate the shortest distance between point A (4812N 01115E) and point P (4812S 16845E) in nautical miles. (5mks)

8. An aircraft was over A at 1435hrs flying direct to B
   Distance **A** to **B** 2900NM
   TAS 470 kts
   W/C Out 55kts tailwind
   W/c home 75 kts headwind
   Safe endurance 9hrs 30min
   The distance from **A** to the point of safe return (PSR)

   (5mks)

9. Aircraft mass at "A" is 52,400kgs
   Aircraft mass at "B" is 46700kgs
   Cruise at Mach0.78@ F350
   OAT:-44°C
   W/C: 30kts tailwind
   What is the TAS, Ground distance, specific fuel consumption and specific air range?

   (8mks)

   a. An aircraft has 2300 Imp gal of fuel in tanks (SG 0.78). The fuel consumption is 2100lbs/h, TAS 250kts and a forecast outbound wind component of 50kts headwind(assume 60kts tailwind for the return) calculate the distance beyond which it will be imprudent to return to the departure airfield to arrive overhead with a reserve of 400 Imp gal. (5MKS)

10. An aircraft was over Q at 1320 hours flying direct to R
    Distance Q to R is 3016nm
    TAS 480kts
    W/c out 90 kts headwind
    W/c home 75kts tailwind
    The distance from Q to the point of safe return (PSR)s?

    (5mks)

PART 2 (30MKS)

1. Determine the Landing Mass for the following single engine airplane.
   Given:
   Standard Empty Mass :1764 lbs.
   Optional Equipment : 35 lbs.
   Pilot + Front seat passenger: 300 lbs.
   Cargo Mass: 350 lbs.
   Ramp Fuel = Block Fuel: 60 Gal.
   Trip Fuel: 35 Gal.
   Fuel density: 6 lbs./Gal.
   a. 2659 lbs.
   b. 2449 lbs.
   c. 2589 lbs.
   d. 2799 lbs **(1mk)**
2. With respect to the optimum altitude, which of the following statements is correct?
   a. An aeroplane flies most time above optimum altitude because this yields the most economic results.
   b. An aeroplane always flies at the optimum altitude because this is economically seen as the most attractive altitude.
   c. An Aircraft always flies below the optimum altitude because Mach buffet might occur.
   d. An Aircraft sometimes flies above or below the optimum altitude because optimum altitude increases continuously during flight. **(1mk)**
3. You are to determine the maximum fuel load which can be carried in the following conditions:

   -Dry operating fuel: 2800kg
   -Trip fuel: 300kg
   -Traffic load: 400kg
   -Maximum take-off mass: 4,200kg
   -Maximum landing mass: 3,700kg

   a. 800kg
   b. 500kg
   c. 700kg
   d. 1000kg **(1mk)**
4. The fuel burn of a turbine engine is 220ltrs/hr with a density of 0.80. If the density is 0.75 the fuel burn will be:
   a. 235ltrs/hr

b. 176ltrs/hr
c. 220ltrs/hr
d. 206ltrs/hr **(1mk)**

5. In the ATC flight plan item 13, in a flight plan submitted before departure, time entered is the:
   a. Estimated take off time
   b. Allocated slot time.
   c. Estimated time over the first point en-route.
   d. Estimated off block time. **(1mk)**

6. A revenue flight is to be made by a jet transport. The following are the aeroplane's structural limits:
   -Maximum Ramp Mass: 69 900 kg
   -Maximum Take Off Mass: 69 300 kg
   -Maximum Landing Mass: 58 900 kg
   -Maximum Zero Fuel Mass: 52 740 kg
   The performance limited take off mass is 67 450kg and the performance limited landing mass is 55 470 kg.
   Dry Operating Mass: 34 900 kg
   Trip Fuel: 6 200 kg
   Taxi Fuel: 250 kg
   Contingency & final reserve fuel: 1 300 kg
   Alternate Fuel: 1 100 kg
   The maximum traffic load that can be carried is:
   a. 25 800 kg
   b. 17 840 kg
   c. 18 170 kg
   d. 13 950 kg

   (1mk)

7. The quantity of fuel which is calculated to be necessary for a jet aircraft to fly IFR from departure aerodrome to the destination is 5352kg
   Fuel consumption in holding modes is 6000kgs/hr
   Alternate fuel is 4380kg
   Contingency should be 5% of trip fuel.
   What is the required quantity of fuel which should be on board at take off?
   a. 13370kg
   b. 13220kg
   c. 13000kg
   d. 14500kg **(1mk)**

8. Which of the following statements is relevant for forming route positions in intergraded range flight planning?
    a. No segment shall be more than 30 minutes of flight time.
    b. Each reporting points requires a new segment.
    c. Small change of temperature 2°C can divide segment.
    d. The distance from take-off up to the top of climb has to be known. **(1mk)**
9. Given;

Distance from departure to destination: 2500nm
TAS: 500Kts
Wind component out: 40kts Tailwind
Wind component on return: 30 Headwind

What is the time of the PET from departure point?

    a. 28 min
    b. 129 min
    c. 180 min
    d. 161 min **(1mk)**

10. Given:

Distance from departure to destination: 2450 nm
Endurance 7.5 hrs
TAS: 41O
Ground speed out: 360 Kts
Ground speed home: 460kts

What is the time of the point of safe return (PSR) from departure point?

    a. 158 min
    b. 252 min
    c. 190 min
    d. 111 min **(1mk)**

11. At the flight preparation stage, the following parameters in particular are available for determining the mass of an aircraft:

1- Dry Operating Mass
2-Operating Mass

Which statement is correct?

    a. Dry Operating Mass includes fixed equipment needed to carry out a specific flight.
    b. Operating Mass is the mass of an aircraft without take off fuel.
    c. Operating Mass includes the traffic load.
    d. Dry Operating Mass includes take off fuel. **(1mk)**

12. After engine failure the airplane is unable to maintain its cruising altitude. What is the procedure that should be followed?
    a. ETOPS
    b. Long Range Cruise Descent
    c. Drift down procedures
    d. Emergency Descent Procedure **(1mk)**
13. The maximum taxi (ramp) mass is governed by :
    a. tyre speed and temperature limitations.
    b. bearing strength of the taxiway pavement.
    c. taxi distance to take - off point.
    d. structural considerations.

    (1mk)
14. A jet Engine aircraft is to fly from point **A-B**. The minimum final reserve fuel must allow for:
    a. 20 minutes hold over alternate airfield
    b. 30 minutes hold at 1500ft above mean sea level
    c. 15 minutes hold at 1500ft above the destination aerodrome elevation
    d. 30 minutes hold at 1500ft above destination aerodrome elevation, when no alternate is required.

    (1mk)
15. Given:

Dry Operating Mass: 5,320 kgs
Zero Fuel Mass: 6,790 kgs
Trip fuel: 770kgs
Take off fuel: 1,310 kgs
The Traffic load is:

    a. 1610 kgs
    b. 3080 kgs
    c. 1470 kgs
    d. 2940 kgs **(1mk)**

16. An aircraft flies at an airspeed of 380kts, it flies from A-B and back to A, distance AB=480 nm, when flying from A-B it experiences a headwind component of 60kt, the wind remains constant. the duration of the flight will be?
    a. 3h 00min
    b. 2h 35min
    c. 2h 10 min
    d. 2h 32 min **(1mk)**
17. The take of mass of an aircraft is 66,700kg, which includes a traffic load of 14,200kg and usable fuel load of 10,500kg, if the standard mass for crew is 545kg the dry operating mass is:

a. 56,200kgs
b. 41,455kgs
c. 42,000kgs
d. 42545kgs **(1mk)**

18. Given the following

Maximum structural take off mass: 48,000kgs
Maximum structural landing mass: 44,000kgs
Maximum zero fuel mass: 36,000kgs
Taxi fuel: 600kgs
Contingency: 900kgs
Alternate fuel: 800kgs
Final reserve fuel: 1,100kgs
Trip fuel: 9,000kgs

The actual take off mass can never be higher than:

a. 48,000kgs
b. 48,400kg
c. 47,800kgs
d. 53,000kgs **(1mk)**

19. What is the equation for the climb gradient expressed as percentage during un accelerated flight(applicable to small angles only)

a. Climb gradient=(thrust-mass/lift)×100
b. Climb gradient=(thrust –drag/mass)×100
c. Climb gradient=(thrust-drag/lift)×100
d. Climb gradient=(thrust-drag/weight)×100 **(1mk)**

20. Departure aerodrome elevation 1500ft;QNH=1023hpa,temperature=ISA,1hpa=30ft
a. 6600ft
b. 6300ft
c. 7800ft
d. 6000ft **(1mk)**

21. The purpose of the decision point procedure is?
a. To increase the amount of extra fuel
b. To reduce the minimum required fuel and the therefore be able to increase the traffic load
c. To reduce the landing weight and thus reduce the structural stress on the aircraft
d. To increase the safety of flight

(1mk)

22. Find the distance to the point of safe return(PSR)
    GIVEN:
    Maximum useable fuel 15,000kg
    Minimum reserve fuel 3,500kg
    Out bound; TAS 425kt
    Head wind component:30kts
    Fuel flow: 2150kg/hr.
    Return: TAS 430kts
    Tailwind component 20kt
    Fuel flow 2150kg/hr.

    a. 1463nm
    b. 1491NM
    c. 1125NM
    d. 1143NM

    (1mk)

23. Given the following :
    - Maximum structural take-off mass 48 000 kg
    - Maximum structural landing mass: 44 000 kg
    - Maximum zero fuel mass: 36 000 kg
    -Taxi fuel: 600 kg
    -Contingency fuel: 900 kg
    -Alternate fuel: 800 kg
    -Final reserve fuel: 1 100 kg
    -Trip fuel: 9 000 kg
    Determine the actual take-off mass:
    a. 47 800 kg
    b. 48 000 kg
    c. 48 400 kg
    d. 53 000 kg

24. The term 'useful load' as applied to an aeroplane includes
    a. the revenue-earning portion of traffic load only.
    b. the revenue-earning portion of traffic load plus useable fuel.
    c. traffic load plus useable fuel.
    d. traffic load only.
25. Given:
    Dry operating mass = 38 000 kg
    maximum structural take-off mass = 72 000 kg
    maximum landing mass = 65 000 kg

maximum zero fuel mass = 61 000 kg
Fuel burn = 8 000 kg
Take-off Fuel = 10 300 kg
The maximum allowed take-off mass and payload are respectively:

a. 73 000 kg and 27 000 kg
b. 71 300 kg and 23 000 kg
c. 71 300 kg and 25 300 kg
d. 73000kg and 22500kg

26. An executive pilot is to carry out a flight to a French aerodrome, spend the night there and return the next day. Where will he find the information concerning parking and landing fees?
    a. In the FAL section of French AIP
    b. In the AGA chapter of French AIP
    c. In the GEN chapter of French AIP
    d. By telephoning the aerodrome 's local chamber of commerce, this type of information not being published **(1mk)**

27. Following in- flight depressurization, a turbine powered aircraft is forced to divert to an en-route alternate airfield. If actual flight conditions are as forecast, the minimum quantity of fuel remaining on arrival at the airfield will be?
    a. At least equivalent to 45 minutes flying time
    b. At least equivalent to the quantity required to fly to another aerodrome in the event that weather conditions so require.
    c. Laid down by the operator, with the quantity being specified in the operations manual
    d. At least equivalent to 30 minutes flying time **(1mk)**
28. The take of mass of an aircraft is 66,700kg,which includes a traffic load of 14,200kg and usable fuel load of 10,500kg, if the standard mass for crew is 545kg the dry operating mass is:
    a. 56,200kgs
    b. 41,455kgs
    c. 42,000kgs
    d. 42545kgs **(1mk)**

29. Which of the following statements is correct?
    a. If the actual center of gravity is close to the forward limit of the center of gravity the airplane may be unstable, making it necessary to increase elevator forces
    b. The lowest stalling speed is obtained if the actual center of gravity is located in the middle between the aft and forward limit of Centre of gravity
    c. A tail heavy aero plane is less stable and stalls at a lower speed than a nose heavy aeroplane

d. If the actual Centre of gravity is located behind the aft limit of Centre of gravity it is possible that the aeroplane will be unstable, making it necessary to increase elevator forces

30. Given:
Distance X TO Y 2700NM
Mach number 0.75
Temperature: -45°c
w/c out: 10kts tailwind
w/c Home :35kts tailwind
the distance from X to the point of Equal time (PET) Between X and Y is:

a. 1350NM
b. 1313NM
c. 1425NM
d. 1386NM

1mk)

END