BAK Assessment Module 10b Working File.
ALPHA LOADING

Q1.

(2 marks)
Refer loading "ALPHA" chart.
Given: TOW 1500 kg/IU –230.

The minimum ballast that must be added to the rear baggage area to bring the aircraft TOW CG within the acceptable loading envelope is ?

WORKING

Find "trend line" by adding say 100 kg to rear baggage, then see which weight the trend line crosses the forward envelope. In this case at about 1525 kg = round up to 30 kg in rear baggage area required.
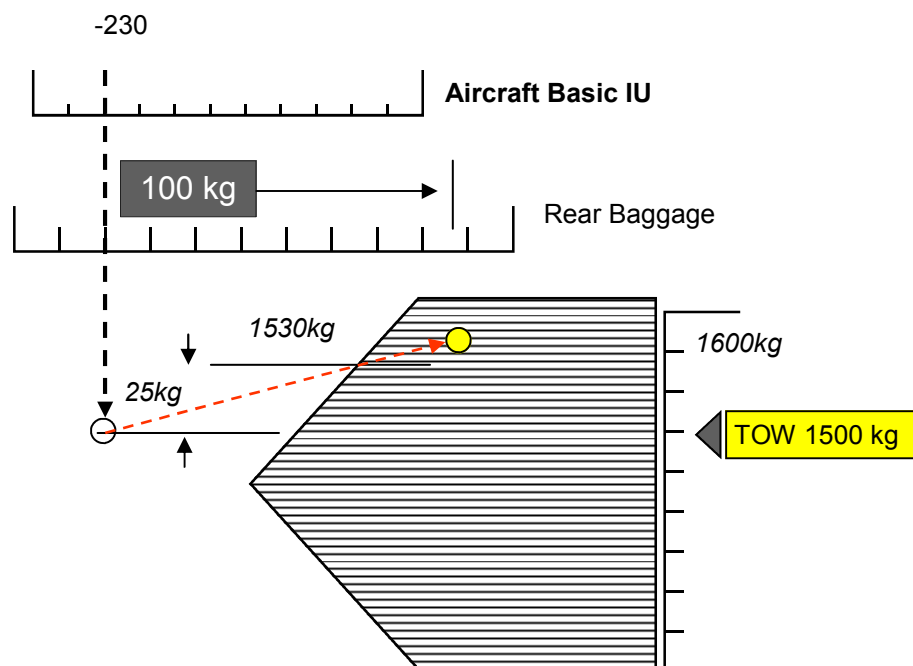
INTELLECTUAL PROPERTY OF ROB AVERY (AVFACTS)

-230

Aircraft Basic IU

100 kg — Rear Baggage

1530kg

25kg

1600kg

TOW 1500 kg

Fig 7.
Load System "ALPHA"
Not to Scale.

Q2.

Q2. (2 marks)
Refer loading "ALPHA" chart.
Given: ZFW 1300 kg/+70 IU.
The minimum baggage or ballast that needs to be loaded in the forward baggage compartment to bring the aircraft ZFW CG within the acceptable rear loading envelope is closest to ?

WORKING

Find "trend line" by adding say 90 kg to forward baggage, then see which weight the trend line crosses the rear of the envelope. In this case at about 1320 kg = 20 kg in rear baggage area required.
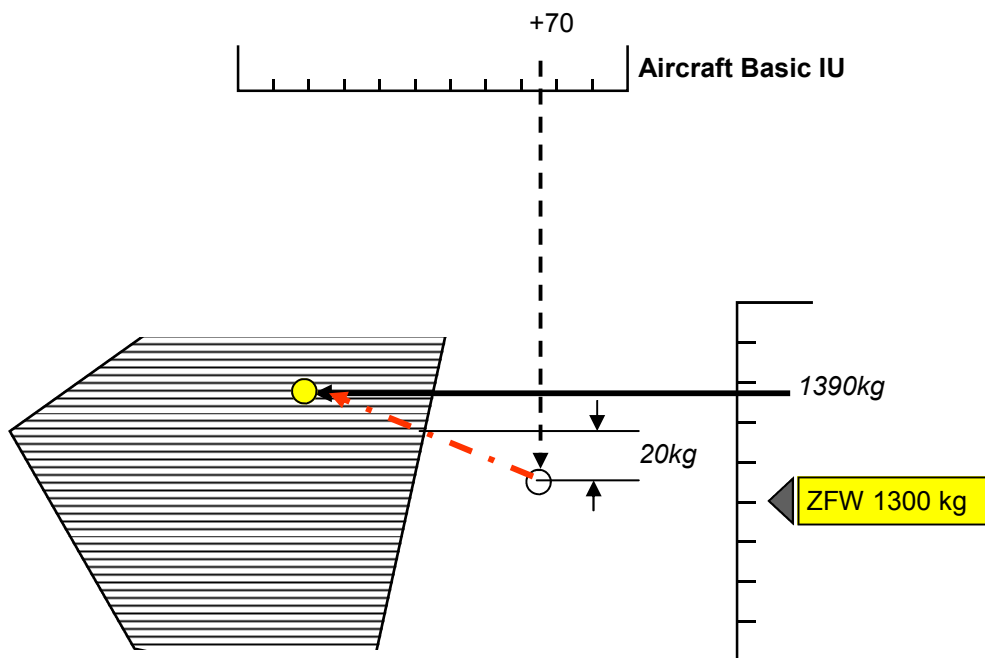
+70

Aircraft Basic IU

1390kg

20kg

ZFW 1300 kg

Fig 7.
Load System "ALPHA"
Not to Scale.

Q3.

(2 marks)
Refer loading "ALPHA" chart.
Given: TOW 1580 kg/+80 IU.
The minimum ballast that must be added to the nose baggage area to bring the aircraft CG within the loading envelope limit at takeoff is closest to ?

WORKING

Find "trend line" by adding say 40 kg to forward baggage, then see which weight the trend line crosses the rear of the envelope. In this case at about 1600 kg = 20 kg in forward baggage area required.
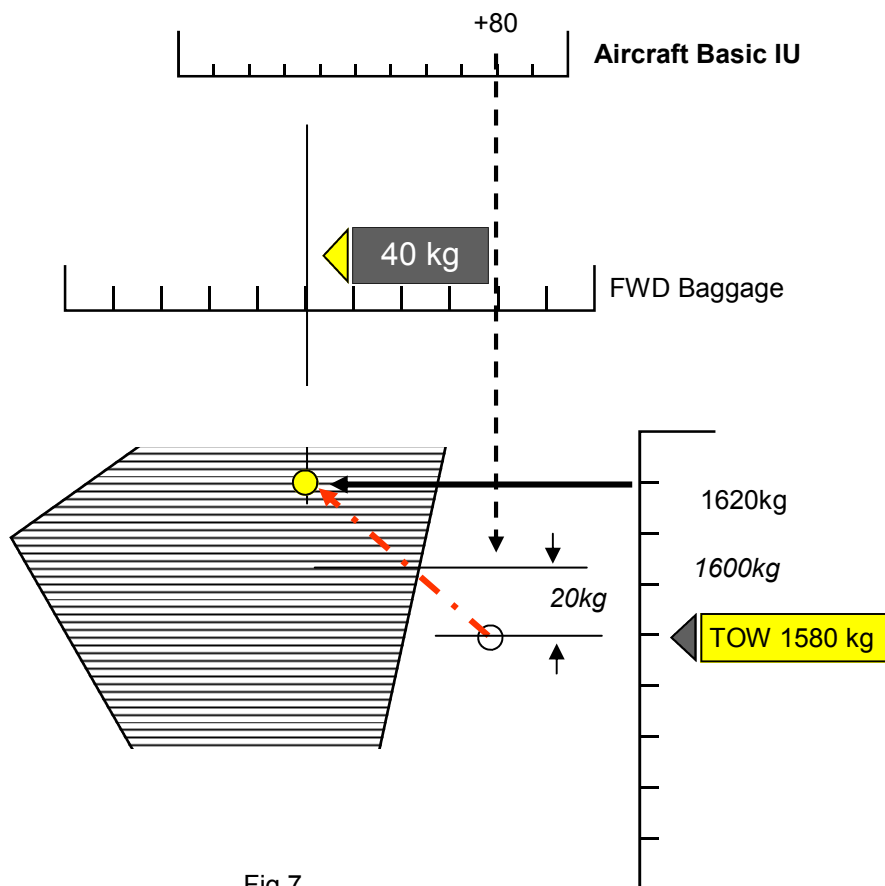
Fig 7.
Load System "ALPHA"
Not to Scale.

Q4.

(2 marks)
Refer loading "ALPHA" chart.
Given: TOW 1200 kg/-300 IU.
The minimum additional fuel required to bring the aircraft TOW CG within the forward loading envelope limit is closest to ?

WORKING

"Trend line" is straight up because fuel in ALPHA does not move the C of G aft or forward. About 55 kg required (where vertical line crosses forward envelope).
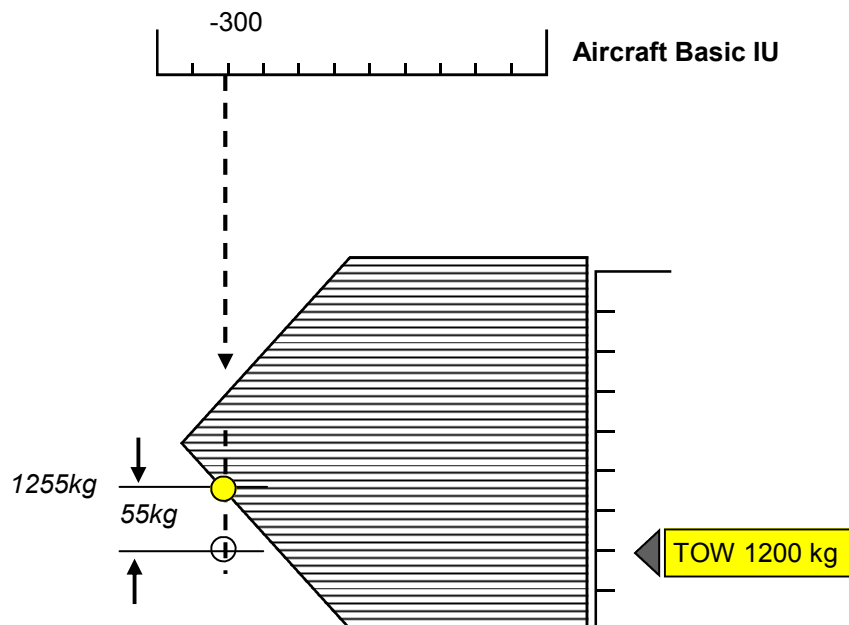
Aircraft Basic IU

-300

1255kg

55kg

TOW 1200 kg

Fig 7.
Load System "ALPHA"
Not to Scale.

Q5.

(2 marks)
Refer loading "ALPHA" chart.
Given: TOW 1200 kg/-330 IU.
The minimum additional passenger weight required in Row 2 (forward facing) to bring the aircraft CG within the forward loading envelope limit is closest to ?

WORKING

Find "trend line" (in red) by adding say 150 kg to Row 1 forward facing zone, then see which weight the trend line crosses the front of the envelope. In this case at about 1240 kg = 40 kg minimum additional passenger weight is required. See diagram below.
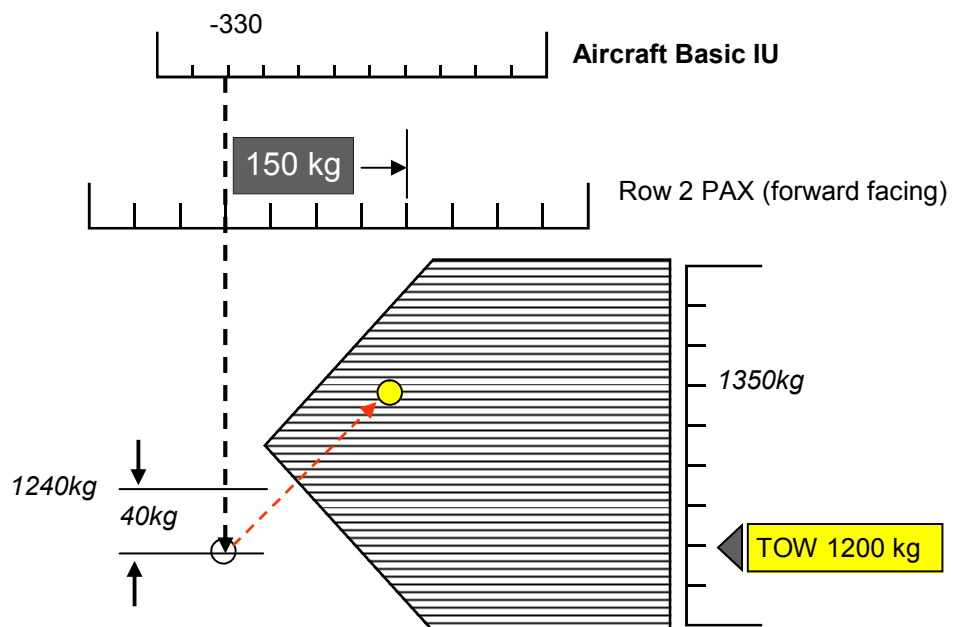

Fig 7.
Load System "ALPHA"
Not to Scale.

Q6.

(3 marks) Refer Loading System "Alpha" in the VFR day Booklet.
Given:
Basic empty weight 1050 kg/IU –230.
The GW (TOW) CG aft of the datum is closest to ?

WORKING

Station	Weight (kg)
Aircraft BEW	1050
Pilot and front passenger (Row 1)	110
Forward Facing Centre Row Passengers (Row 2)	154
Passengers in rear row (Row 3)	100
Nose baggage area	40
Rear baggage area	10
ZFW	1464
Plus Fuel - 140 Litres (100 kg)	100
Take-off weight	1564

< 1633 kg *OKAY !*

Answer !

-230

- 20   **Aircraft Basic IU**

Row 1-110 kg

Row 2 FWD -154 kg

Row 3–100 kg

Nose Bags-40 kg

Rear Bags-10 kg

Fuel 100 kg

TOW 1564 kg OKAY !

ZFW 1464 kg OKAY !

Fig 7.
Load System "ALPHA"
Not to Scale.
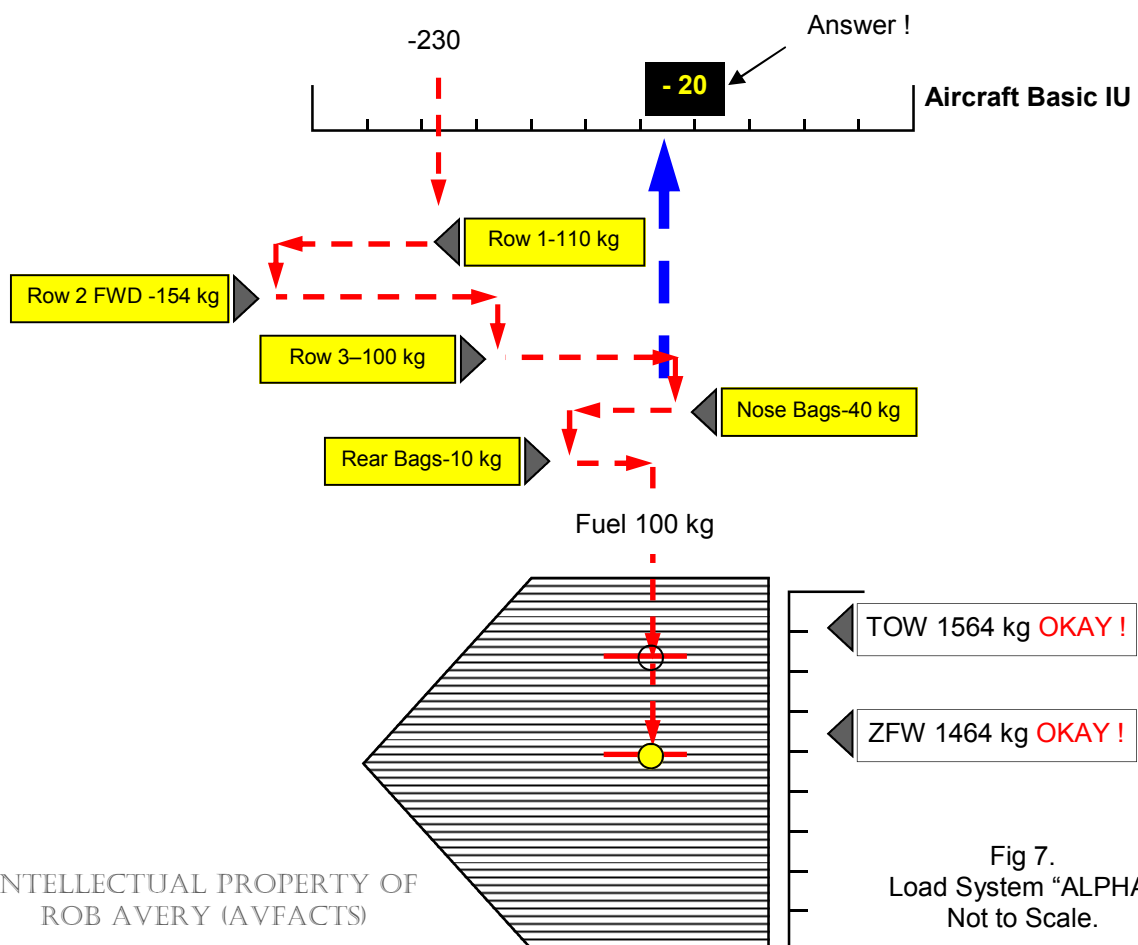
Q7.

(3 marks) Refer Loading System "Alpha" in the VFR day Booklet.
Given:
Basic empty weight 1075 kg/IU –260.
The TOW CG is closest to ?

WORKING

Station	Weight (kg)
Aircraft BEW	1075
Pilot and front passenger (Row 1)	150
AFT Facing Centre Row Passengers (Row 2)	154
Passengers in rear row (Row 3)	125
Nose baggage area	25
Rear baggage area	—
ZFW	1529
Plus Fuel - 113 Litres (80 kg)	80
Take-off weight	1609

< 1633 kg *OKAY !*

-260

- 40 ← Answer !

Aircraft Basic IU

Row 1-150 kg

Row 2 AFT -154 kg

Row 3–125 kg

Nose Bags-25 kg

Rear Bags-Nil

Fuel 80 kg

TOW 1609 kg OKAY !
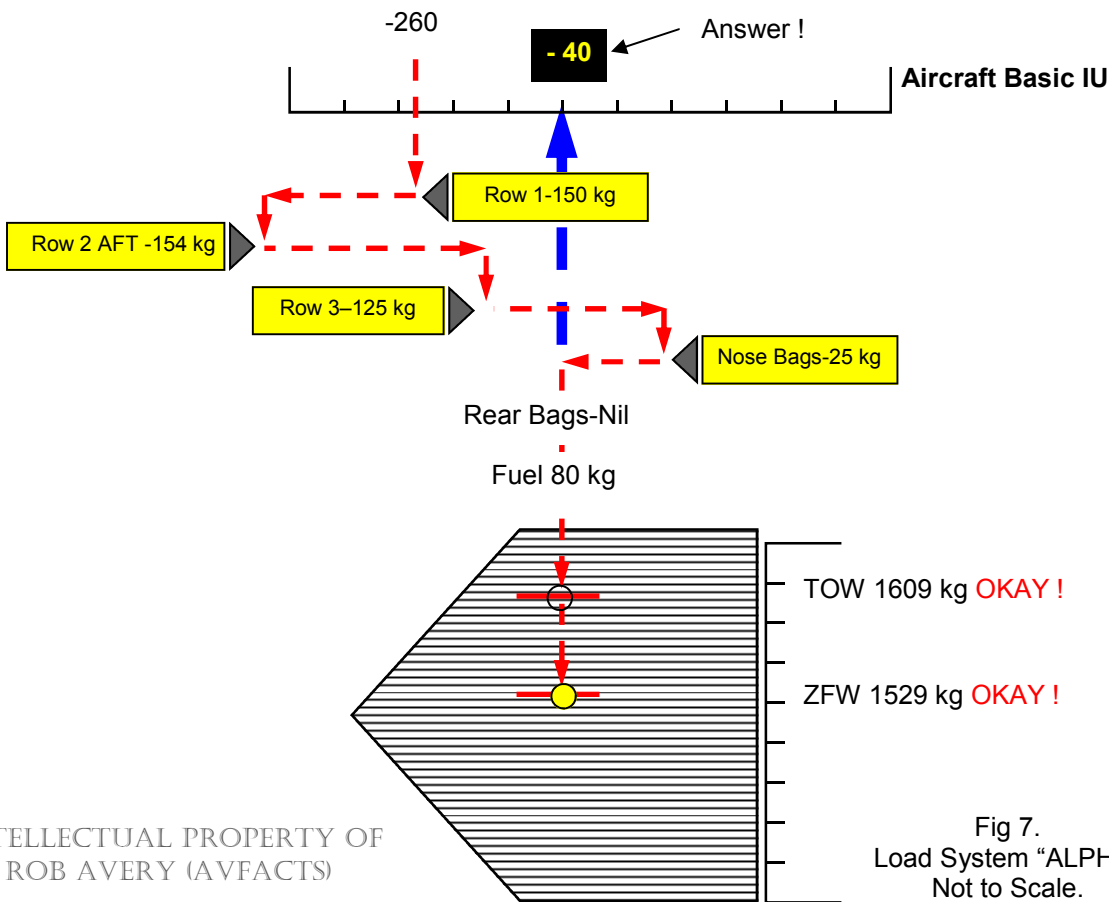
ZFW 1529 kg OKAY !

Fig 7.
Load System "ALPHA"
Not to Scale.

Q8.

Q8. (5 marks)
Given:

- Basic Operating Weight is 1060/-280 IU.
- Fuel load - Full tanks.
- Pilot weight 75 kg.
- Row 1 passenger weight 50 kg.

The minimum ballast that must be loaded in any area to bring the CG within the forward CG envelope limit is closest to ?

WORKING

Station	Weight (kg)
Aircraft BEW	1060
Pilot and front passenger (Row 1)	125
Forward Centre Row Passengers (Row 2)	Nil
Passengers in rear row (Row 3)	Nil
Nose baggage area	Nil
Rear baggage area	Nil
ZFW	**1185**
Plus Fuel - 365 Litres (252 kg)	252
Take-off weight	**1437**

< 1633 kg OKAY !

Aircraft Basic IU

-280

Row 1-125 kg

Row 2 NIL

Row 3 NIL

Nose Bags NIL

Rear Bags NIL

Fuel 252 kg

40 kg

1195 kg

10 kg

1185 kg

Draw in "trend lines for say 100 kg from ZFW and TOW positions. Whichever is the larger is the ballast to load. In this case at TOW (40 kg). New TOW is therefore 1477 kg - See diagram.

NOTE: Check adding this does not exceed MTOW of 1633 kg. It does NOT, so OKAY !!

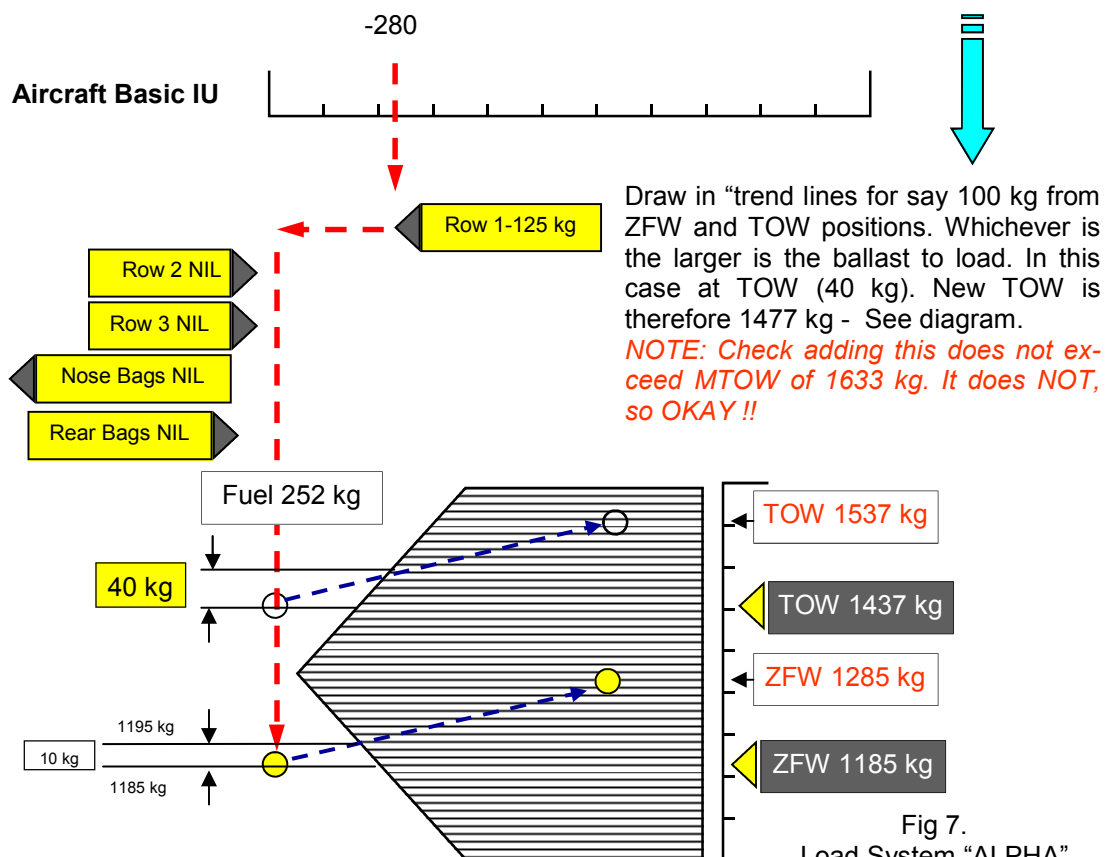TOW 1537 kg

TOW 1437 kg

ZFW 1285 kg

ZFW 1185 kg

Fig 7.
Load System "ALPHA"
Not to Scale.

Q9.

(5 marks)
Given:

- Basic Operating Weight is 1050/-240 IU.
- Pilot weight 75 kg.
- Row 1 passenger weight 70 kg.
- Row 2 (forward facing) passengers total 154 kg.
- Rear baggage area - Maximum weight allowed.
- Nose baggage area - 20 kg.

The maximum fuel that can be loaded while keeping the CG within the forward CG envelope limit is closest to ?

WORKING

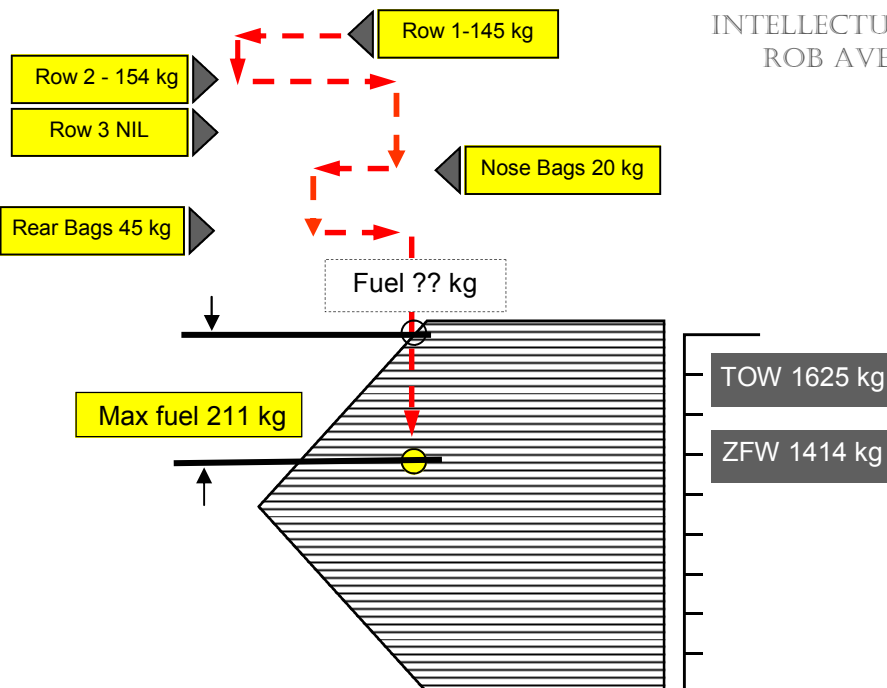| Station	Weight (kg)
Aircraft BEW	1050
Pilot and front passenger (Row 1)	145
Forward Centre Row Passengers (Row 2)	154
Passengers in rear row (Row 3)	Nil
Nose baggage area	20
Rear baggage area	45
ZFW	**1414**

Plot ZFW position, then draw a vertical line (representing fuel being added), until it intersects with the forward envelope limit - at about 1625 kg in this case. See diagram below.

Subtract ZFW of 1414 kg from TOW of 1625 kg to get max fuel that may be loaded = 211 kg. *Answer !!*

Aircraft Basic IU

-240

For BAK exam round down to 200 kg to be conservative.

Row 1-145 kg

Row 2 - 154 kg

Row 3 NIL

Nose Bags 20 kg

Rear Bags 45 kg

INTELLECTUAL PROPERTY OF
ROB AVERY (AVFACTS)

Fuel ?? kg

TOW 1625 kg

Max fuel 211 kg

ZFW 1414 kg

Fig 7.
Load System "ALPHA"
Not to Scale.

End of BAK Assessment Module 10b Working File.