higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

AIRCRAFT MAINTENANCE THEORY N2

04 December 2023

This marking guideline consists of 6 pages.

Copyright reserved

SECTION A

QUESTION 1

1.1	1.1.1	C		
	1.1.2	B		
	1.1.3	B		
	1.1.4	A		
	1.1.5	B		
			(5 × 1)	(5)
1.2	1.2.1	True		
	1.2.2	True		
	1.2.3	True		
	1.2.4	True		
	1.2.5	True		
			(5 × 1)	(5)
1.3	1.3.1	F		
	1.3.2	A		
	1.3.3	B		
	1.3.4	C		
	1.3.5	E		
			(5 × 1)	(5)
1.4	1.4.1	Angle of attack		
	1.4.2	Compression		
	1.4.3	Viscosity index		
	1.4.4	Volatility		
	1.4.5	Pitch angle		
			(5 × 1)	(5)
				[20]

TOTAL SECTION A: 20

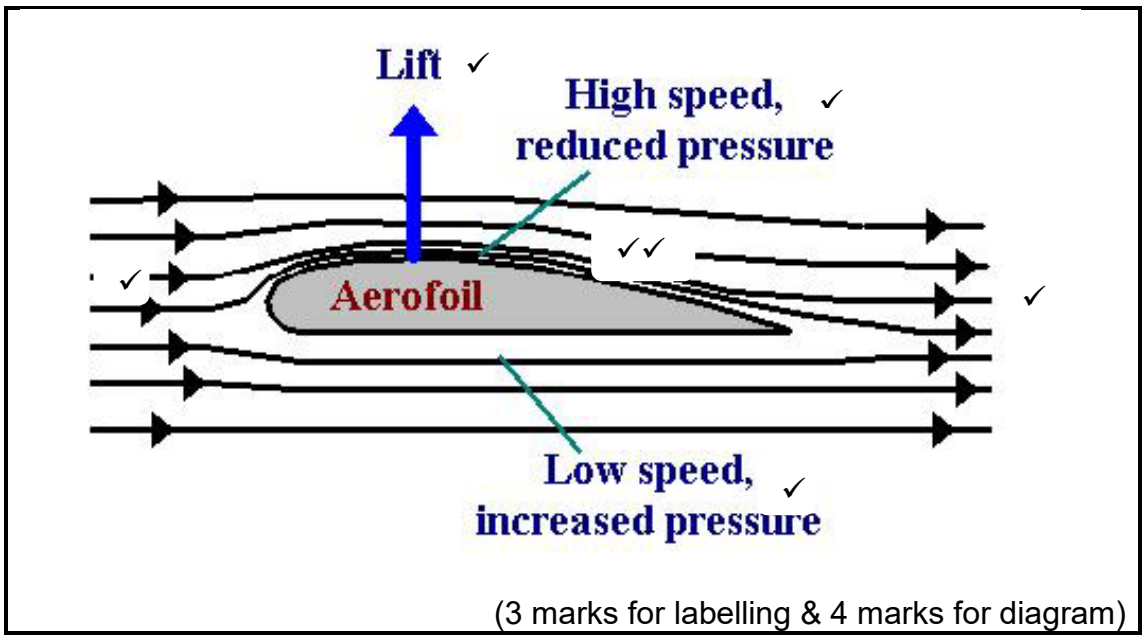
Copyright reserved

SECTION B

QUESTION 2

2.1 It is the angle between the chord line✓ and the relative airflow. (2)

2.2



(3 marks for labelling & 4 marks for diagram) (7)

2.3 Directional control✓
The aircraft is directionally controlled about the vertical axis during flight by means of the rudder.✓ The pilot will move the rudder pedals to the left or right giving a direct input to the control surfaces by the use of cables or push-rods or combinations of these assisted by hydraulic servos.✓ Boeing uses cables, input rods and PCU's for actuation, causing the rudder to deflect to the left or right.✓✓ The deflection causes the aircraft to yaw about the vertical axis.✓ (6)

2.4
- Compression
- Tension
- Torsion
- Bending
- Shear (5)

[20]

QUESTION 3

3.1
- Leading edges of the wings
- Leading edges of the vertical and horizontal stabilisers (10)

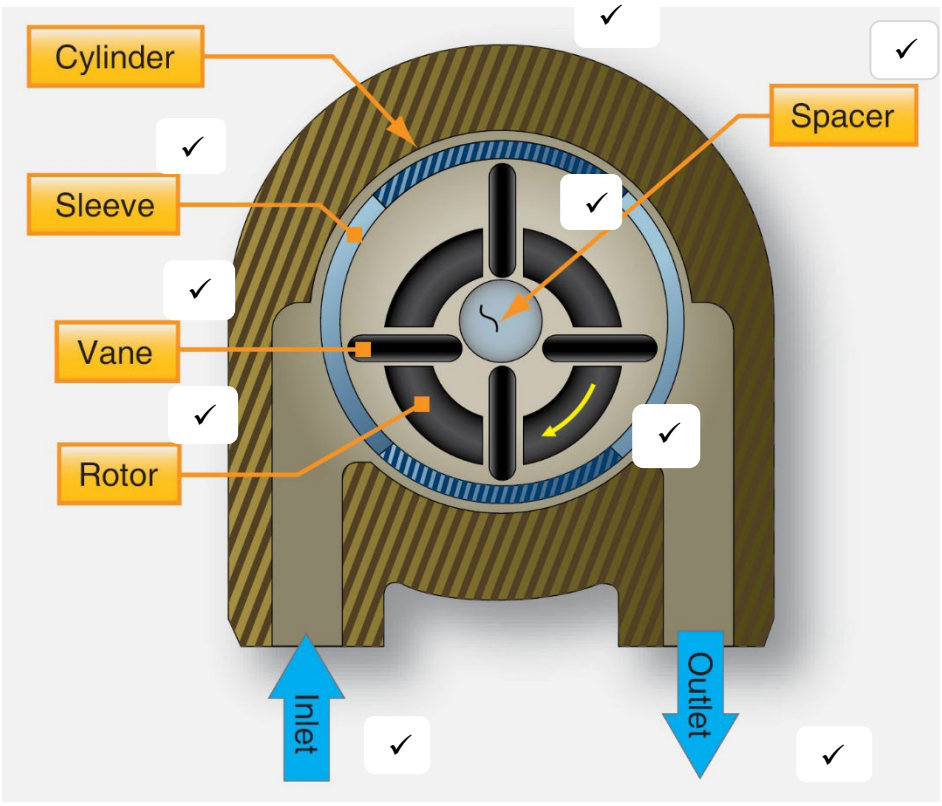
- Windshields, windows and radomes
- Heaters and engine air inlets
- Stall warning transmitter
- Pilot tubes
- Flight tubes
- Flight controls
- Leading edges of propeller blades
- Carburettors
- Lavatory drains
- Antennas (Any 10 × 1)

3.2
- Gears
- Gerotors
- Vanes
- Piston (4)

3.3 A – Outlet
B – Input shaft
C – Gear
D – Inlet
E – Gear
F – Output shaft (6 × 1) (6)
[20]

QUESTION 4

4.1



(5 marks for labels & 5 marks for diagram) (10)

4.2
- High cost
- Difficulty of manufacture
- Relatively high weight
- High starting power requirements
- Good efficiencies over only a narrow rotational speed range (5)

4.3
- Too high compression ratios
- An increase in manifold air pressure
- Insufficient cylinder cooling
- Too high carburettor inlet temperatures
- Wrong fuel/air ratios
- Incorrect timing – spark advanced too far
- Wrong position of the spark plugs
- Shape of the combustion chamber (Any 5 × 1) (5)

[20]

QUESTION 5

5.1
- Intake stroke✓ – Piston moves down✓
- Compression stroke✓ – Piston moves up✓
- Power stroke✓ – Piston moves down✓
- Exhaust stroke✓ – Piston moves up✓ (4 × 2) (8)

5.2
- A gyroplane has a more conventional fuselage,✓ is equipped with a conventional propeller to produce thrust,✓ has an empennage and may have stub wings.✓
- A helicopter has no propeller for producing forward thrust,✓ but relies solely on its rotor for lift and thrust.✓ A small rotor is provided at the tail to counter balance the torque of the main rotor.✓ (2 × 3) (6)

5.3 The degree✓ of an oil's resistance to flow.✓ (2)

5.4
- The hub assembly
- The dome assembly
- The anti-icing assembly
- The distributor valve assembly (for feathering on single-acting propellers) or engine-shaft-extension assembly (for non-feathering or double-acting propellers). (4)

[20]

TOTAL SECTION B: 80
GRAND TOTAL: 100

Copyright reserved