higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

AIRCRAFT MAINTENANCE THEORY N1

(11041091)

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09:00–12:00

This question paper consists of 6 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
AIRCRAFT MAINTENANCE THEORY N1
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Start each section on a new page.
5. Use only a black or a blue pen.
6. Write neatly and legibly.

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QUESTION 1

Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–C) next to the question number (1.1–1.10) in the ANSWER BOOK.

1.1 Which primary control system is fitted to the vertical stabiliser?

A Aileron
B Elevator
C Rudder

1.2 Which heat treatment process will be applied to release strain in the crystal structure of the steel?

A Hardening
B Normalizing
C Tempering

1.3 Aircraft bulletins are …

A history of aircraft condition, data of inspections on aircraft.
B step-by-step instructions to service the aircraft.
C publications issued by engine and component manufacturers.

1.4 What is meant by stalling angle?

A It's the angle of attack at which the lift of an aerofoil is its maximum
B It's the angle of incidence which the drag on a aircraft is at its minimum
C It's a whirling or twisting flow of air over an aerofoil

1.5 Factors affecting corrosion:

A Density
B Size of metal
C Pressure

1.6 Shear stress on aircraft structure.

A Where the forces applied cause a twisting action
B Is the stress develop when a force tends to cause a layer of material to slide along an adjacent layer
C Is stress that tends to crush material together

1.7 Requirements of hydraulic fluids.

A Must be compressible
B Must absorb moisture
C Good lubricant

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1.8 The purpose of the relief valve in hydraulic systems:

A To limit the amount of pressure being exerted on confined liquid
B To regulate the output of the pump
C To store hydraulic fluid under pressure

1.9 General requirements for gas turbine fuel:

A A very high degree of purity
B By-products of combustion should have no harmful effect on the flame tubes and turbine sections
C Have a low calorific value

1.10 The purpose of oil control rings on piston engines:

A To control the thickness of the oil film on cylinder walls
B To control the thickness of fuel on the cylinder walls
C To control the quantity of lubricant supplied to the cylinders

(10 × 1) **[10]**

QUESTION 2

Indicate whether the following statements are TRUE or FALSE.by writing only 'True' or 'False' next to the question number (2.1–2.5) in the ANSWER BOOK.

2.1 The advantage of a fixed-pitch propeller is that the blade pitch can be changed during flight.

2.2 The epicyclic gear drive is used as a reduction gear type on propellers.

2.3 Due to the increase in altitude and the increase in density superchargers are used on aircraft.

2.4 The main parts of a supercharger are the impeller and diffuser.

2.5 The magneto consists of two major parts – the generator and transformer.

(5 × 1) **[5]**

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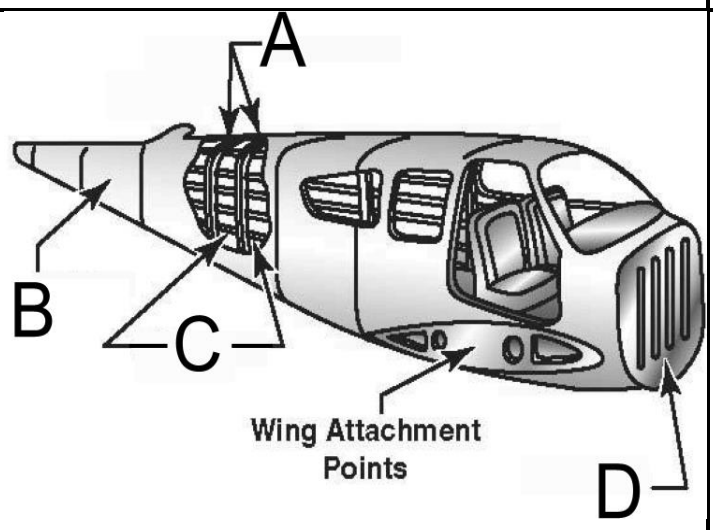
QUESTION 3

Choose a term from COLUMN B that matches a description in COLUMN A. Write the letter (A–H) next to the question number (3.1–3.5) as well as the type of fuselage construction in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1		A	Bulkhead
3.2		B	Longeron
3.3		C	Formers
3.4		D	Skin
3.5		E	Stringers
		F	Monocoque
		G	Semi monocoque
		H	Truss type

(5 × 1) **[5]**

QUESTION 4

4.1 List FIVE corrosion preventative maintenance procedures. (5)

4.2 Name THREE advantages and TWO disadvantages of the semi-monocoque fuselage construction. (5)

4.3 State THREE types of drag and give an example of each. (6)

4.4 Make a neat labelled sketch to show the distribution of pressure over an aerofoil at a 4° angle of attack. (4)

[20]

QUESTION 5

5.1 List FIVE advantages of the use of a hydraulic systems on aircraft. (5)

5.2 State TEN components of a typical hydraulic system used on aircraft. (10)

5.3 Illustrate with a neat sketch a twin engine cross-feed fuel system. (10)

[25]

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QUESTION 6

6.1 List TEN mayor components of a helicopter. (10)

6.2 List the basic sections and parts of a reciprocating radial engine. (10)
[20]

QUESTION 7

7.1 Make a neat labelled sketch of a single-stage gas-turbine engine (10)

7.2 Compare THREE advantages and TWO disadvantages of a centrifugal gas-turbine engine (5)
[15]

TOTAL: 100

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