higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T30**(E)**(A14)T

NATIONAL CERTIFICATE

AIRCRAFT METALWORK THEORY N2

(11021102)

14 August 2019 (X-Paper)
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 METALWORK THEORY N2
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. Sketches must be large, neat and fully labelled.
5. Write neatly and legibly.

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QUESTION 1: DEVELOPMENT

FIGURE 1 shows a metal article in the shape of a truncated cone.

Copy the article in the ASWER BOOK and then develop the full structure. Show ALL the projection lines on the development. ALL the dimensions are in millimetres.

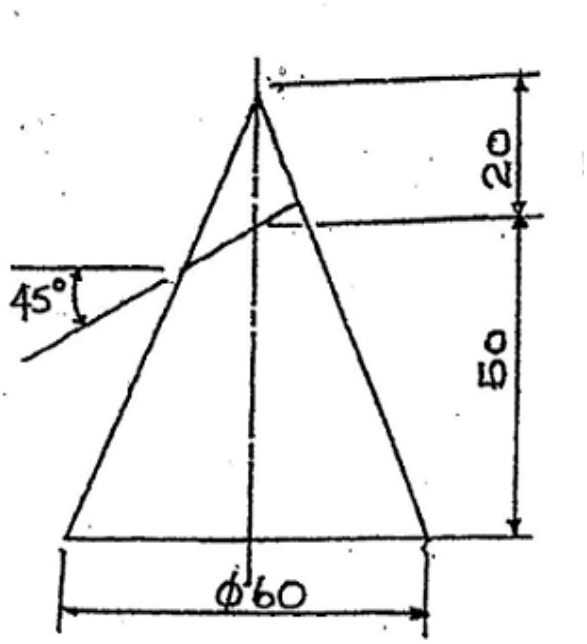

FIGURE 1 **[15]**

QUESTION 2: GENERAL

2.1 What is the most important factor that determines the minimum and maximum spaces between rivets? (1)

2.2 What is the purpose of the relief hole? (2)

2.3 What size drill is used to remove a rivet? (2)

2.4 Where is the title block usually located on a drawing? (2)

2.5 What causes electrolytic corrosion on aircraft structures? (2)

2.6 On which type of metal corrosion forms a greenish film? (1)

[10]

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QUESTION 3: MATERIAL

3.1 Name the THREE factors that determine the requirements to be met by any material used in airframe construction. (3)

3.2 The letter 'T' applies to heat treatable alloys. It is usually followed by a digit to indicate the type of treatment.

Name the following alloys:

3.2.1 T3

3.2.2 T4

3.2.3 T6

3.2.4 T7

(4 × 2) (8)

3.3 An alloy is said to be in the heat-treated condition when it has been subjected to a heat-treatment process.

Describe the heat-treatment process of alloys. (4)
[15]

QUESTION 4: CORROSION

4.1 Corrosion on aircraft and its control is a real problem that requires continuous preventative maintenance.

State FIVE corrosion preventative maintenance functions.

4.2 Foreign material is among the controllable factors affecting corrosion.

Give FIVE examples of foreign material that could affect corrosion.

(2 × 5) **[10]**

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QUESTION 5: FASTENERS

5.1 Complete the table of rivet head identification shown in FIGURE 2 by writing only the answer next to the question number (5.1.1–5.1.10) in the ANSWER BOOK.

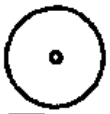
RIVET HEAD	HEAD MARKING	ALLOY CODE
	5.1.1	5.1.2
	5.1.3	5.1.4
	5.1.5	5.1.6
	5.1.7	5.1.8
	5.1.9	5.1.10

FIGURE 2 (10 × 1) (10)

5.2 Describe the whole preparation of a taper-lock fastener. (5)
[15]

QUESTION 6: CONSTRUCTION

6.1 When removing a tank from an aircraft, care should be taken with the handling of the tank.

Explain what must be avoided when handling a fuel tank and why. (5)

6.2 Make a neat, labelled sketch of a semi-monocoque aircraft construction. (7)

6.3 Make a neat, labelled sketch to show a damaged skin and core repair procedure **OR** describe the procedure of a core and skin repair. (8)
[20]

QUESTION 7: TOOLS

7.1 State the types of measurements taken by the following measurement instruments:

7.1.1 Vernier callipers (3)

7.1.2 Micrometer. Also state its accuracy. (4)

7.2 Name the parts indicated on the sketch of an outside micrometer in FIGURE 3 by writing only the answer next to the letter (A–H) in the ANSWER BOOK.

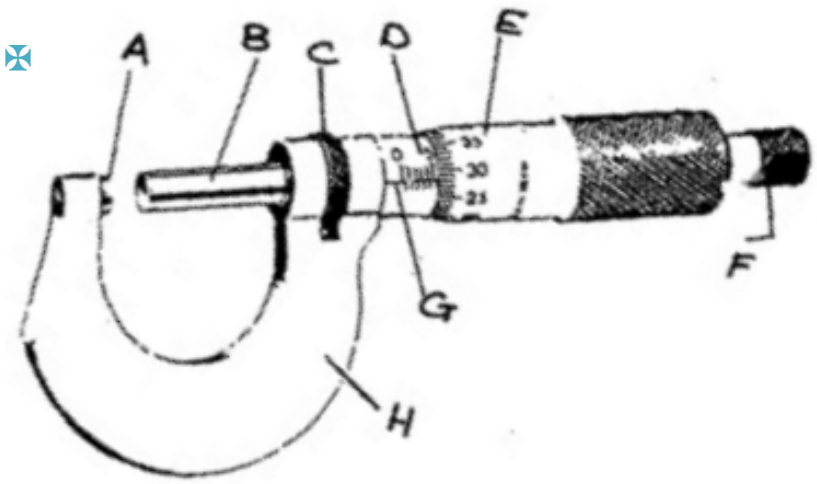


FIGURE 3 (8)

[15]

TOTAL: 100

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