higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

AIRCRAFT MAINTENANCE THEORY N2

(11041102)

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This question paper consists of 4 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
AIRCRAFT MAINTENANCE 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. Start each section on a new page.
5. Use only a black or blue pen.
6. Drawings must be done in pencil and should be large enough to show all details.
7. Drawings must be properly labelled on the drawing and be legible.
8. Write neatly and legibly.

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QUESTION 1

1.1 Make neat, labelled drawings to demonstrate the difference between the lift created by a flat plate and an aerofoil. (6)

1.2 Make a neat, labelled drawing by means of a drag curve, to show how drag changes, with a change of angle of attack. (3)

1.3 Explain what effect shear force has on an assembled structure. (3)

1.4 A cluster/station of a truss type welded tubular construction has been seriously damaged. A patch plate repair can be done.

Make a neat, labelled drawing of what the completed repair would look like after the plate has been welded in place. (4)

1.5 Describe the function of the reservoir of a hydraulic system. (4)
[20]

QUESTION 2

2.1 Some aircraft are equipped with positive-displacement cabin superchargers for their pressurisation systems.

Name TWO of the types of positive-displacement cabin superchargers. (2)

2.2 Make a neat, labelled drawing of the leading edge of a wing thermal anti-icing system using a piccolo tube to distribute the hot air through the leading edge of the wing structure. (6)

2.3 Explain the function of the pressure regulating valve on the pneumatic system. (2)

2.4 What is the purpose of checking an aircraft wing's incidence angle during air frame rigging checks? (1)

2.5 At the return of a flight with a light aircraft the pilot reports that his controls are stiff during operation.

State FOUR possible causes for this problem. (4)

2.6 Explain the purpose and process of annealing of mild steel. (4)

2.7 Briefly explain the cause of stress corrosion. (2)
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QUESTION 3

3.1 How can inter-crystalline corrosion be treated if it is discovered on an aircraft structure or component? (2)

3.2 Briefly describe what is meant by the term pre-ignition and surface-ignition to distinguish between them. (4)

3.3 What does the term viscosity refer to with reference to liquids? (2)

3.4 State FOUR advantages that an injection carburettor brings about when compared to a float type carburettor. (4)

3.5 Make a neat, labelled drawing of a simple diagram to illustrate a basic/simple gas turbine engine's fuel control unit. (6)

3.6 Make a simple, labelled drawing of a turbocharger to show the components that it consists of. (4)

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QUESTION 4

4.1 Explain what is meant when reference is made to constant speed propellers. (4)

4.2 What does it mean when reference is made to the term *brake horse power* (B.H.P.)? (2)

4.3 Describe how an acceleration check is done on an engine during a ground run. (Describe any engine but indicate whether it is the procedure for a piston or gas turbine engine.) (6)

4.4 Give a brief outline of a minor inspection of the landing gear of a light commercial aircraft. (4)

4.5 State FOUR factors that can affect the thrust output of a gas turbine engine. (4)

[20]

QUESTION 5

5.1 Make a neat, labelled drawing of a turbo propeller engine containing centrifugal compressors. (8)

5.2 Explain the function of the tail rotor gearbox of a helicopter and name where it is located on a helicopter. (4)

5.3 What does the term autorotation mean? (3)

5.4 Define the rotor term *plane of rotation*. (2)

[17]

TOTAL: 100

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