

3.22.2 Aviation Technology Paper 2 (450/2)

STATION 1

Figure 1 shows a pictorial view of a hydraulic system paper filter.
On the drawing paper provided:

- (a) Sketch in good proportion the exploded view of the filter. (8 marks)

- (b) Name **four** parts. (2 marks)

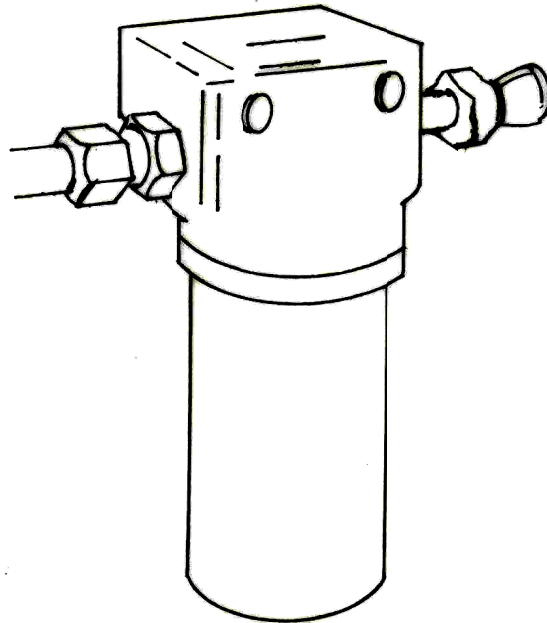


Figure 1

STATION 2

Using the tools, equipment and materials provided, make an overlap patch as shown in **Figure 2**.

(10 marks)

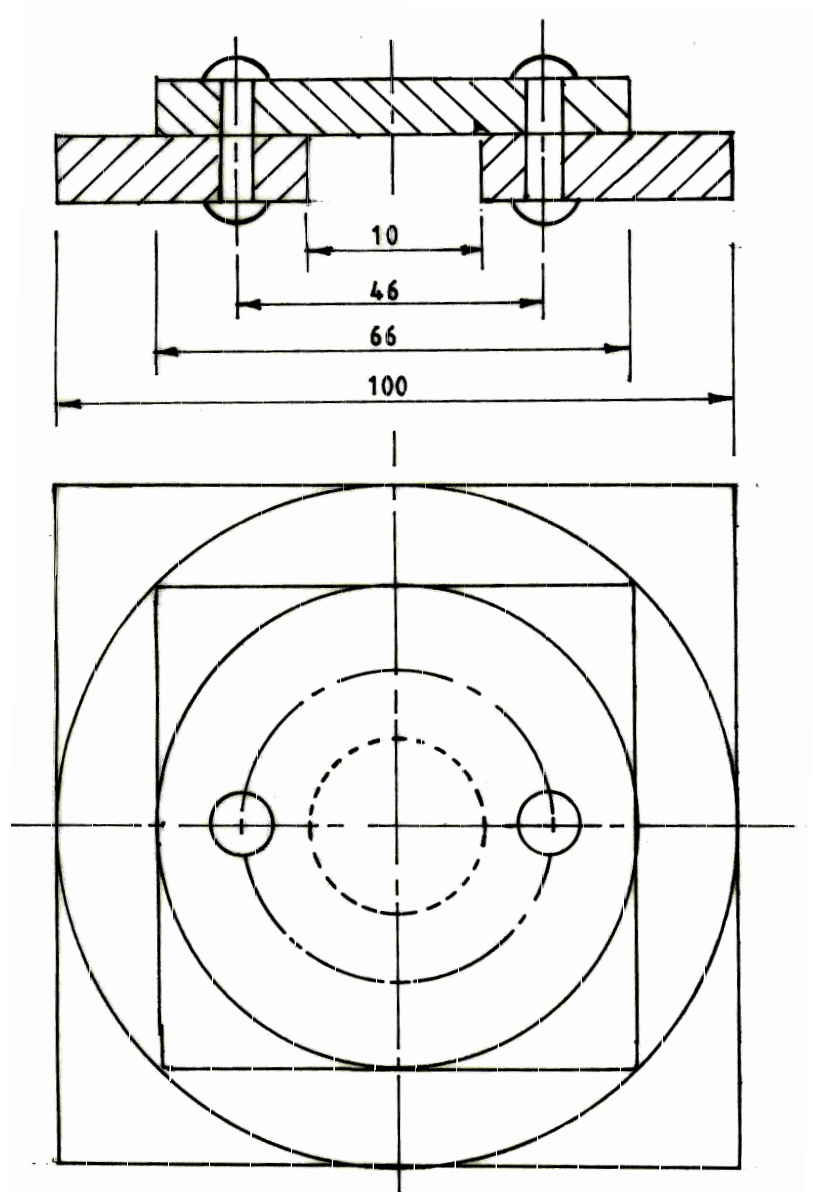


Figure 2

STATION 3

Using the tools and the connecting rod parts provided, carry out the following tasks:

- (a) Measure and record the following:
- (i) inside diameter of the small end;
 - (ii) roundness of the Gudgeon pin;
 - (iii) pitch of the cap bolt;
 - (iv) width of the cap bearing. (4 marks)
- (b) Identify **two** rejection criteria for the nut. (2 marks)
- (c) State the function of the **two** design features painted red and blue on the cap bearing.
- Red
- Blue (1 mark)
- (d) Give **two** inspection checks carried out on the connecting rod assembly.
- (i)
- (ii) (1 mark)
- (e) Identify and state the function of the piston rings labelled X and Y.
- X
- Y (2 marks)

STATION 4

- (a) Using the materials provided, make and label the aircraft wing plan forms to suit each of the following flow regimes:
- (i) subsonic;
 - (ii) supersonic;
 - (iii) hypersonic, (6 marks)
- (b) On the subsonic plan form, determine and show its:
- (i) surface area; (2 marks)
 - (ii) aspect ratio. (2 marks)

STATION 5

- (a) (i) Identify the materials labelled A, B, C and D and state where each is used in the aircraft. (4 marks)

	NAME	WHERE USED
A	_____	_____
B	_____	_____
C	_____	_____
D	_____	_____

- (b) Using the materials provided, demonstrate to the examiner the correct procedure of carrying out the dye penetrant test on the part labelled P. (6 marks)

STATION 6

- (a) Using the tools and equipment provided, carry out the tabulated tests on the materials labelled P and Q and record your observations in the table. (8 marks)

Test	Material P	Material Q
Breaking		
Cutting		
Burning		
Bending		

- (b) Identify the materials P and Q and state one application of each in an aircraft. (2 marks)

P

Application

Q

Application

STATION 7

- (a) Study the instrument labelled X and identify the following:
- (i) principle of operation of the instrument;
 - (ii) aircraft system used;
 - (iii) starting requirement.
- (1 ½ marks)
- (b) Using the pump and instrument assemblies labelled Y, W and Z, carry out the following tasks.
- (i) connect the pump to the instrument labelled Y, pump slowly and state: (½ mark)
- I. your observation;
 - II. the reason behind your observation;
 - III. **one** application in an aircraft.
- (2 marks)
- (ii) Repeat b(i) above with instrument labelled W. (2 marks)
- (iii) Repeat b(i) above with instrument labelled Z. (2 marks)
- (c) For the instruments labelled Y, W and Z state:
- (i) the principle of operation;
 - (ii) **two** maintenance tasks. (2 marks)

STATION 8

Using the tools, equipment and materials provided, carry out the following tasks:

- (a) strip one end of the cable provided to expose about 5mm of each layer.
Let the examiner check your work. (2 marks)
- (b) (i) Identify the type of cable;
- (ii) State **one** application in an aircraft;
- (iii) Sketch and label the four layers. (4 marks)
- (c) Solder the connector provided to the other end of the cable. **Let the examiner check your work.** (4 marks)

STATION 9

Using the tools provided, carry out the following tasks:

- (a) Remove the spark plug from the aeropiston cylinder provided and:
- (i) measure and record the size of the gap; (1 mark)
 - (ii) state the condition of the gap;
 - (iii) state the function of the gap. (3 marks)

Replace the spark plug and **let the examiner check your work.**

- (b) Identify the parts marked A and B. (1 mark)

A

B

- (c) Study the spark plug hole marked H and:
- (i) identify the defect;
 - (ii) state the repair method for the defect. (2 marks)

- (d) Remove the tappet cover and list **four** missing parts: (2 marks)

(i)

(ii)

(iii)

(iv)

- (e) Replace the tappet cover and **let the examiner check your work.** (1 mark)

STATION 10

(a) State the system in which each of the aircraft parts labelled L, M and N is used.

L
 M
 N

(1 ½ marks)

(b) Identify the aircraft components labelled P, Q and R and complete the table below:

(4 ½ marks)

COMPONENT	NAME	APPLICATION	MAINTENANCE REQUIRED
P			
Q			
R			

(c) Study the components labelled S, T, U and V and state one reason for discarding.

(4 marks)

COMPONENT	NAME	REASON FOR DISCARDING
S		
T		
U		
V		