UNIT 1 TEST

70 marks

1 Use the words in the box to write compound (two-word) nouns from Unit 1. **10 marks**

strength	area	rivet	conductivity	power	brake	units	plant	conditions	engine

Example: melting *point*

1 horse _____
2 rotary _____
3 operating _____
4 air _____
5 tensile _____
6 surface _____
7 power _____
8 imperial _____
9 thermal _____
10 blind _____

2 Complete this table with nouns and adjectives. **10 marks**

	adjective	noun
Example	*metallic*	*metal*
1		malleability
2	ductile	
3		brittleness
4	hard	
5		density
6	conductive	
7		elasticity
8	suitable	
9		toughness
10	strong	

3 Complete this specification for an airship, using the numbers and units below. Use each unit once only.

10 marks

20 2 x 180 800 6,000 kg m hp km m^3 kph

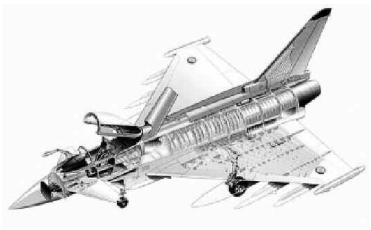
	number	unit
passengers	14	
maximum speed	150	
length	60	
ceiling		m
engines		
volume	10,000	
crew	4	
width		m
range		
cruise speed	120	kph
payload weight	1,500	

4 Complete the sentences below each drawing with words and phrases from the box.

20 marks

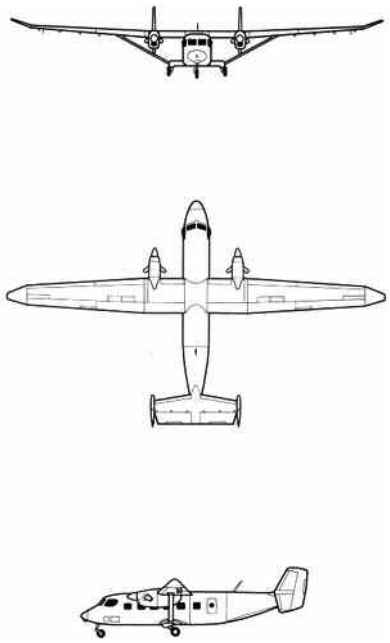
rough sketches orthographic projection two-engine four-engine cutaway components jet fighter perspective exploded detailed

A



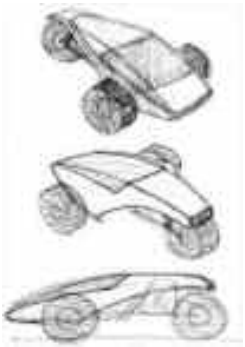
This is a _____ view of a _____. It shows the position and size of important parts inside the aircraft.

B



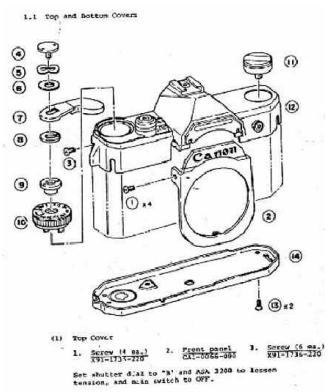
These are _____ _____ views of a _____ passenger plane. They show a side view, a plan view and a front view drawn to scale.

C



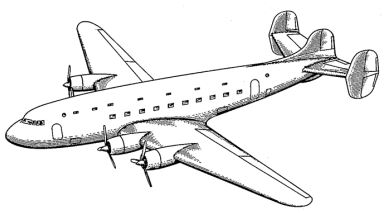
These are _____ _____ of a three-wheeled car. They show the general idea of what it will look like but there isn't any _____ information.

D



This is an _____ or assembly view of a camera. It shows the important internal and external _____ and how they are fitted together.

E



This is a _____ view of a _____ passenger plane. It shows what the plane really looks like when it is flying.

5 Write questions about these things to fit the answers. 10 marks

1 How _____ the hovercraft move?
It rides on a cushion of air.

2 What _____ exploded/assembly drawing?
It's a drawing which shows how something is assembled.

3 What _____ ejection seat do?
It allows the pilot to eject from the plane.

4 Which _____, spiders' silk or steel?
Spiders' silk is much stronger.

5 How many _____ this airship carry?
It can carry up to 12 passengers.

6 How _____ this plane fly?
It only flew once.

7 How _____ cost to build?
More than $25,000,000.

8 Where _____ Bristol Brabazon built?
It was built in Bristol in England.

9 Does glass _____ easily?
Yes it does. It's very brittle.

10 _____ fuel cost less in the future?
No, it will probably cost more.

6 Read the information and decide whether the sentences below are true or false. **10 marks**

TITANIUM AND TITANIUM ALLOYS

In aircraft construction and repair, titanium is used for fuselage skins, engine covers, firewalls, longerons, frames, fittings, air ducts and fasteners. Titanium is used to make compressor disks, spacer rings, compressor blades and vanes, as well as bolts, turbine housings and liners, and miscellaneous hardware for turbine engines.

Titanium falls between aluminium and stainless steel in terms of elasticity, density and elevated temperature strength. It has a melting point of 2,730°F to 3,155°F, low thermal conductivity and a low coefficient of expansion. It is light, strong, and more resistant to metal fatigue and stress-corrosion cracking than aluminium. Titanium's high resistance to corrosion is caused by the formation of a protective skin of oxide, the surface of which prevents further corrosion into the metal. Titanium is approximately 60 percent heavier than aluminium and about 50 percent lighter than stainless steel.

The ultimate yield strength of titanium drops rapidly above 800°F. The absorption of oxygen and nitrogen from the air at temperatures above 1,000°F makes the metal so brittle on long exposure that it soon becomes worthless. However, titanium does have some value for short-time exposure up to 3,000°F, where strength is not important. Aircraft firewalls demand this requirement.

Unlike ferrous metals such as steel, titanium is non-magnetic. However, it has an electrical resistance similar to that of stainless steel. Some of the base alloys of titanium are quite hard, although heat treating and alloying do not develop the hardness of titanium to the high levels of some of the heat-treated alloys of steel. Iron, molybdenum and chromium are used to stabilise titanium and produce alloys that will quench harden and age harden. The addition of these metals also adds ductility.

(Adapted from *Standard Aircraft Handbook for Mechanics and Technicians* by Larry Reithmaier.)

Circle the correct answer according to the text.

1 Many aircraft components are made from titanium. True/False

2 Titanium has the same density as aluminium and steel. True/False

3 Titanium parts wear out more quickly than aluminium ones. True/False

4 Titanium doesn't corrode easily. True/False

5 Steel weighs more than aluminium. True/False

6 Titanium's strength increases as it gets hotter. True/False

7 At extremely high temperatures, titanium breaks very easily. True/False

8 Stainless steel is magnetic. True/False

9 Pure titanium is more ductile than titanium alloy. True/False

10 Titanium alloys are not as hard as some steel alloys. True/False