Headquarters Air Cadets
Examination

Staff Cadet
33/4 Airframes
Generated 19-Jul-04
Serial: 756

1. *Use black or dark blue pen, NOT pencil.*
2. *Mark one answer per question with a cross.*
3. *If you wish to change an answer, cancel the original mark and mark another single answer.*

☒ *A selected answer.*
☒ *A cancelled answer.*

Mark:

Name and Initals _____ Date of Exam _____

Date of Birth _____ Squadron/Unit _____ Wing _____

1 How many main components does an aircraft have:

- *a* ☐ 3
- *b* ☐ 1
- *c* ☐ 4
- *d* ☐ 6

2 Which major airframe component has control surfaces which provide stability and control in pitch and yaw:

- *a* ☐ The tail unit
- *b* ☐ The wings
- *c* ☐ The fuselage
- *d* ☐ The ailerons

3 The main construction components of an airframe are ties, struts, beams and webs. A web is a member which is subject purely to:

- *a* ☐ Loads at an angle
- *b* ☐ Tension (pulling)
- *c* ☐ Compression
- *d* ☐ Loads in shear

4 The cantilever construction of an airframe is used for aircraft of all speed because:

- *a* ☐ It offers the highest aspect ratio
- *b* ☐ It offers the lowest wing loading
- *c* ☐ It offers the lowest drag
- *d* ☐ It offers the highest drag

5 At speeds near to the speed of sound the pressure waves generated in front of an aircraft cannot move forwards fast enough to warn the oncoming air an aircraft is approaching and they become:

- *a* ☐ SHOCK PRESSURES
- *b* ☐ PRESSURE WAVES
- *c* ☐ SHOCK WAVES
- *d* ☐ SHOCK WEAVES

6 The most important characteristic of materials used in airframe construction is that they have:

- *a* ☐ A low RSW
- *b* ☐ A high WSR
- *c* ☐ A low SWR
- *d* ☐ A high SWR

7 Steel is an alloy of:

- *a* ☐ TITANIUM
- *b* ☐ IRON
- *c* ☐ MAGNESIUM
- *d* ☐ ALUMINIUM

8 At a precise temperature two pieces of titanium pressed together will fuse and become a single piece. This process is called:

- *a* ☐ Rediflusion blonding
- *b* ☐ Diffusion bonding
- *c* ☐ Fusion bonding
- *d* ☐ Diffusion bending

9 What is the fatigue life, in flying hours, of the BULLDOG aircraft:

- *a* ☐ 50 000
- *b* ☐ 5000
- *c* ☐ 45 000
- *d* ☐ 4500

10 One of the two main components of an aircraft wing is the internal structure, the other is:

- *a* ☐ The skin
- *b* ☐ The ribs
- *c* ☐ The spars
- *d* ☐ The aileron

11 What is the ideal shape for a cut out in a fuselage:

- *a* ☐ A rectangle
- *b* ☐ A circle
- *c* ☐ A rectangle with rounded corners
- *d* ☐ An ellipse

12 Where are the engines mounted on a Dominie aircraft

- *a* ☐ In the nose
- *b* ☐ On the wings
- *c* ☐ In pods under the wings
- *d* ☐ At the rear of the fuselage

13 What is an OLEO LEG:

- *a* ☐ A gas-filled telescope
- *b* ☐ A spring steel shock absorber
- *c* ☐ A telescopic shock absorber
- *d* ☐ A Spanish undercarriage

14 When brakes overheat they tend to:

a ☐ Dissipate
b ☐ Fade
c ☐ Break up
d ☐ Burn out

15 Which plane of movement is controlled by the rudder:

a ☐ SLIP
b ☐ YAW
c ☐ ROLL
d ☐ PITCH

16 The control column or stick operates elevators and:

a ☐ UNDERCARRIAGE
b ☐ FIN
c ☐ AILERONS
d ☐ RUDDER

17 The system where an unstable aircraft can be flown by computer without control cables or linkages is known as:

a ☐ Fly-by-wire
b ☐ Fly-by-stability
c ☐ Fly-by-night
d ☐ Fly-by-height

18 Where a hydraulic actuator is used to move a jack to a specific position, rather than to the end of its travel, we use:

a ☐ A servo accumulator
b ☐ Several actuators
c ☐ Several accumulators
d ☐ A servo actuator

19 Elevons are control surfaces which combine the functions of elevators and:

a ☐ CANARDS
b ☐ FLAPS
c ☐ AILERONS
d ☐ RUDDER

20 Routine flying for long periods on one heading can easily be performed by a mechanical or electronic system called:

a ☐ An autopilot
b ☐ An autonav
c ☐ An autodirector
d ☐ An autoguide

21 An autopilot performs two fundamental operations. It detects when an aircraft has strayed from the required flight path and:

a ☐ It calculates and performs correcting control movements
b ☐ It measures the errors involved
c ☐ It sends error messages to the pilot's headset
d ☐ Re-calculates the ETA at the destination

22 The device which detects a disturbance in the flight parameters is part of the autopilot system and is called a:

a ☐ Rate horoscope
b ☐ Rate magnatron
c ☐ Great gyroscope
d ☐ Rate gyroscope

23 Autopilot disturbance correctors are called:

a ☐ Serving-motors
b ☐ Servo-motors
c ☐ Service-motors
d ☐ Salvo-motors

24 What is the meaning of ILS?

a ☐ Instrument Landing System
b ☐ Interim Landing System
c ☐ Immediate Landing System
d ☐ Interim Lighting System

25 What instrument is represented in this diagram

a ☐ VSI
b ☐ SVI
c ☐ HVI
d ☐ HIS