

HUMAN FACTORS FINAL EXAMINATION FD WILSON CLASS

1. Which component(s) is/are transporting the oxygen in the blood?
 - A. Haemoglobin in the red blood cells.
 - B. White blood cells
 - C. Plasma
 - D. Blood fat

2. The retina allows for the acquisition of colours as a result of the:
 - A. Rods located in its peripheral zone
 - B. Cones located in its central part
 - C. Rods located in its central part
 - D. Crystalline lens

3. The atmosphere contains the following gases:
 - A. 78% Nitrogen, 21% Oxygen, 1 % carbon monoxide, rest: rare gases.
 - B. 78% Helium, 21% oxygen, 1% Carbon monoxide, rest: rare gases
 - C. 78% Helium, 21% Oxygen, 0.03% carbon dioxide, rest: rare gases
 - D. 78% Nitrogen, 21% Oxygen, 0.03% carbon dioxide, rest: rare gases

4. Which one of the following symptoms could a person get when he is subjected to hypoxia?
 1. Fatigue
 2. Euphoria
 3. Lack of concentration
 4. Pain in the joints
 5. Sensation of suffocation
 - A. 1, 2 and 3 are correct
 - B. 4 and 5 are correct
 - C. 1, 2, 3 and 4 are correct
 - D. Only 5 is false

5. Symptoms caused by gas bubbles in the lungs, following a decompression are called:
 - A. Creeps
 - B. Leans
 - C. Chokes
 - D. Bends

6. You can overcome hyperventilation by breathing into a plastic or paper bag. The intention is:
 - A. To increase the amount of nitrogen in the lung
 - B. To reduce blood pressure
 - C. To raise the level of CO₂ in the blood as fast as possible

- D. To prevent you from exhaling too much oxygen
7. Any prolonged exposure to noise in excess of 90 db can end up in.
- A. A ruptured ear drum
 - B. Noise induced hearing loss
 - C. Conductive hearing loss
 - D. Presbycusis (effects of aging)
8. With regard to short term memory we can say that
- A. It is made up of everyday information for immediate use and is limited in its capacity for storing and retaining information
 - B. It is made up of everyday information for immediate use and is limited in terms of time for which it retains data but not in its storage capacity
 - C. It is a stable form of working memory and thus not very sensitive to any disturbance
 - D. It mainly contains procedural knowledge not needed immediately
9. When assessing an individual risk in developing coronary artery diseases, the following factors may contribute
- 1) Obesity
 - 2) Distress
 - 3) Smoking
 - 4) Family history
- A. 1,2,3,4 are correct
 - B. 2 and 3 are correct; 1 and 4 are false
 - C. Only 3 is correct; 1,2, and 4 are false
 - D. 1,2,3 is correct ; 4 is false
10. Carbon monoxide, a product of incomplete combustion, is toxic because
- A. It prevents the absorption of food from the digestive tract
 - B. It prevents the excretion of waste matter in the kidneys
 - C. It disturbs gaseous diffusion at the alveoli capillary membrane
 - D. It competes with oxygen in its union with hemoglobin
11. Pain in the joints (“bends”), which suddenly appear during a flight, are symptoms of
- A. Hypoxia
 - B. Decompression sickness
 - C. Barotraumas
 - D. Air-sickness
12. What is “divided attention”?
- A. Ease of concentrating on a particular objective

- B. Difficulty of concentrating on a particular objective
- C. The adverse effect of motivation which leads to one's attention being dispersed.
- D. The ability to carry out two or more tasks that do not overload the memory.

13. Which measure(s) will help to compensate hypoxia?

- 1. Descend below 10,000ft
- 2. Breathe 100% oxygen
- 3. Climb to or above 10 000ft
- 4. Reduce physical activities.

- A. 1 and 2 are correct, 3 and 4 are false
- B. 1, 2 and 4 are correct
- C. 1, 2 and 3 are correct
- D. Only 1 is correct

14. When focusing on near objects:

- A. The pupil gets large
- B. The shape of lens gets more spherical
- C. The shape of lens gets flatter
- D. The cornea gets smaller

15. The heart muscle is supplied with blood from the

- A. Coronary arteries
- B. The auricles
- C. The right and left ventricles
- D. The pulmonary veins

16. The metabolism of alcohol (processing of alcohol from the body)

- A. Is a question of time
- B. Is quicker when one is used to it
- C. Can be accelerated by eating and drinking coffee
- D. Can be quickened by medication

17. The biological reaction to stress is identical regardless of the cause of stress. This mechanism occurs in three phases. The sequence is:

- A. Alarm phase-denial phase-exhaustion phase
- B. Exhaustion phase-resistance phase-adaptation phase
- C. Resistance phase-exhaustion phase-recovery phase
- D. Alarm phase-resistance phase-exhaustion phase

18. When exhaling. The expired air contains

- A. Less water vapour than the inhaled air
- B. More oxygen than the inhaled air
- C. More carbon dioxide than the inhaled air

D. More nitrogen than the inhaled air

19. Which of the following statement(s) is /are correct

1. The retina has rods on its peripheral and cones on its central zone
2. The retina has cones and the crystalline lens has rods
3. The rods allow for night vision
4. The cones are located on the peripheral zone of the retina

- A. 2, 3
- B. 4
- C. 1, 3
- D. 1

20. Which of the following is most true?

- A. Regular exercise is beneficial to general health, but the most efficient way to lose weight is by reducing caloric consumption.
- B. Regular exercise is an impediment to losing weight since it increases the metabolic rate
- C. Regular exercise is beneficial to general health and is the only effective way to lose weight.
- D. Regular exercise and reduction in caloric consumption are both essential in order to lose weight.

21. What is decompression sickness

- A. A frequent disorder in commercial aviation due to pressurization of aircraft
- B. A disorder which is only encountered below 18,000ft
- C. The formation of bubbles in the body tissue with no consequences.
- D. A sickness resulting from the formation of nitrogen bubbles in the body after a cabin pressure loss at high altitude

22. Noise induced hearing loss is influenced by

- A. The duration and intensity of a noise
- B. The duration of a noise but not its intensity
- C. The suddenness of onset of a noise
- D. The intensity of the noise but not its duration

23. What is the effect of stress on performance?

- 1: It always reduces performance.
- 2: Optimum performance is obtained with optimum arousal.
- 3: Excessive stress weakens performance
- 4: Insufficient stress weakens performance.

The combination of the correct statement is:

- A. 1,3,4
- B. 1,2,4
- C. 2,3,4
- D. 1,2,3

24. Information stays in the short term memory

- A. About 24 hours
- B. About 20 seconds
- C. Less than 1 second
- D. From 5 – 10 minutes

25. Breathing 100% oxygen at 38000 ft is equivalent to breathe ambient air at:

- A. 8 000 ft
- B. 14 000 ft
- C. 18 000 ft
- D. 10 000 ft

26. If information in the working memory if not rehearsed will be lost in

- A. 1 to 2 seconds
- B. 8 to 12 seconds
- C. 5 to 10 seconds
- D. 10 to 20 seconds

27. The capacity of the working memory (short term memory) may be expanded by

- A. Constant repetition of the material
- B. Chunking the material
- C. Immediate transfer of the material to the long term memory
- D. Practice of the use of mnemonics as memory aids

28. Human factors have been statistically proved to contribute approximately

- A. 50% of aircraft accidents
- B. 70% of aircraft accidents
- C. 90% of aircraft accidents
- D. Have not played a significant role in aircraft accidents

29. What should a pilot do if disoriented at night?

- A. Ignore his instruments
- B. Look at the horizon
- C. Descend
- D. Rely on his instruments

30. After SCUBA diving (more than 30 feet of depth) you have to wait a period of time before flying again. This period is at least:

- A. 24 hours
- B. 6 hours
- C. 12 hours
- D. 48 hours

31. Our body takes its energy from:

- 1: Minerals
- 2: Protein
- 3: Carbohydrates
- 4: vitamins

- A. 1,3
- B. 2,3
- C. 1,2,3,4
- D. 1,4

32. One of the substances present in the smoke of cigarettes can make it significantly more difficult for the red blood cells to transport oxygen as a consequence contributes to hypoxia. Which substance are we referring to?

- A. Carbonic anhydride
- B. Tar
- C. Carbon dioxide
- D. Carbon monoxide

33. Anxiety and fear can cause

- A. Hyperventilation
- B. Hypoxia
- C. Disorientation
- D. Air sickness

34. Which data compose the ICAO standard atmosphere?

- 1. Density
- 2. Pressure
- 3. Temperature
- 4. Humidity

- A. 3, 4
- B. 1,2,3
- C. 1,2,4
- D. 2,3,4

35. Sleeplessness or the disruption of sleeping patterns
1. Can lead to symptoms of drowsiness, irritability and lack of concentration.
 2. Will make an individual more prone to make errors
- A. 1 and 2 are both not correct
B. 1 and 2 are both correct
C. 1 is not correct, 2 is correct
D. 1 is correct, 2 is not correct
36. The maximum number of unrelated items that can be stored in the working memory is
- A. Unlimited
B. About 7 items
C. Very limited about 3 items
D. About 30 items
37. The semi circular canals form part of the
- A. Inner ear
B. Middle ear
C. Ear drum
D. External ear
38. Oxygen combined with hemoglobin in blood is transported by
- A. White blood cells
B. Red blood cells
C. Platelets
D. Blood Plasma
39. Hyperventilation is
- A. a too high percentage of nitrogen in the blood
B. a decreased lung ventilation
C. a too high percentage of oxygen in the blood
D. an increased lung ventilation
40. According to the ICAO standard atmosphere, the temperature lapse rate of the troposphere is approximately
- A. Constant in the atmosphere
B. 2 °c every 1000ft
C. 10 °c every 100ft
D. 2 °c every 1000 meters

PART TWO

Answer any four questions

1. (a) Explain why the human body needs oxygen **4 marks**

(b) List the composition of blood and indicate six functions of blood and the circulation system **10 marks**
2. (a) Mention at least four major signs and symptoms of hypoxia and explain how hypoxia can be treated **10 marks**

(b) Differentiate between hypoxia and hyperventilation **4 marks**
3. Explain the characteristics and functions of both the Cones and Rods in a human eye **6 marks**
4. List and explain the four major signs and symptoms of decompression sickness **8 marks**
5. Explain how tobacco and smoking affects the human body and especially when flying **10 marks**

