



**EAST AFRICAN SCHOOL OF AVIATION  
EXAMINATIONS**

**FINAL EXAM**

**SAFETY SECTION**

**SUBJECT: HUMAN FACTORS**

**Stream: Flight Dispatch 25**

**Duration: 2Hrs**

**DATE: 15/05/17**

**TIME: 2.00 – 4.00PM**

---

**Instructions to Candidate:**

- 1. This paper consists of **NINE (9)** pages*
- 2. Answer **ALL** questions in **Section A and B***
- 3. Examination rules and regulations should be adhered to.*
- 4. Maximum marks are indicated on each question*

**STUDENT'S NAME:** .....

**STUDENT'S NUMBER:** .....

**SECTION A**

1. What causes long or short sightedness?
  - A. Distortion of the cornea and the Iris
  - B. Presbyopia and the pupil
  - C. Distortion of the whole eyeball
  - D. Distortion of the lens and the fovea
  
2. After a rapid decompression at an altitude of 30 000 ft the first action of the pilot shall be:
  - A. Preventing panic of the passengers
  - B. Maintaining aircraft control and preventing hypoxia
  - C. Informing the operator and the ATC
  - D. Informing the cabin crew
  
3. Hyperventilation is caused by:
  - 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
  
4. The "Chokes" are associated with
  - A. Hyperventilation
  - B. Decompression Sicknesses
  - C. Blockage of the alveoli
  - D. Oxygen loss
  
5. How is the rate and depth of breathing controlled by
  - A. the amount of oxy-hemoglobin in the blood and lungs
  - B. the amount of oxygen in the blood and lungs
  - C. the amount of carbon dioxide and oxygen in the blood and lungs
  - D. the carbonic acid , water vapor and nitrogen mixture in the blood and lungs
  
6. The chemical substance responsible for addiction to tobacco is
  - A. The combination of nicotine ,tar and carbon monoxide
  - B. Tar
  - C. Nicotine
  - D. Carbon monoxide
  
7. To be effective in losing weight exercise must be regular and sufficient to
  - A. Raise the resting pulse by 30% for at least 30 minutes 3 times a day
  - B. Raise the resting pulse by 100% for at least 20 minutes 3 times a week
  - C. Raise the resting pulse by 20% for at least 30 minutes 30 times a week
  - D. Raise the resting pulse by 30% for at least 60 minutes 3 times a week

8. If information in the short term memory (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
9. The heart muscle is supplied with blood from
- A. The Coronary arteries
  - B. The heart veins
  - C. The Ventricle arteries
  - D. The Pulmonary veins
10. The factor which most increases risk of coronary disease is
- A. Lack of exercise
  - b Family history
  - c. Obesity
  - d. Smoking
11. Symptoms of hyperventilation are caused by
- A. Shortage of carbon dioxide in the blood
  - B. Surplus of carbon dioxide in the blood
  - C. Surplus of Oxygen and carbon dioxide in the blood
  - D. Shortage of carbon monoxide in the blood
12. When a person looks at a near object, the:
- A. Lens flattens
  - B. Pupil becomes smaller
  - C. Cornea becomes more curved
  - D. Cornea changes shape
13. The sleep pattern is closely associated with:
- a. Heart beat rate
  - b. Breathing rate
  - A. c. Blood pressure
  - d. Body temperature
14. The primary symptom of Decompression Sickness (DCS) is:
- a. The Bends
  - b. Oxygen bubbles in the blood
  - c. Formication
  - d. Cyanosis
15. The maximum number of unrelated items that can be stored in the working memory is
- a. Unlimited
  - b. About 7 items
  - b. c. Very limited about 3 items
  - d. About 30 items
16. Apnoea is:
- A. An inability to stop falling asleep when in sleep credit
  - B. An inability to stop falling asleep when in sleep debit
  - C. A cessation of breathing whilst asleep
  - D. Sleep walking

17. A natural 'free run' of the circadian rhythm of the human body is:  
a. 24 hours                      b. 25 hours                      c. 26 hours                      d. 48 hours
18. Decompression Sicknesses (DCS) are caused by:  
A. Increased gas within the joints  
B. Decrease of oxygen in the blood  
C. Increased carbon dioxide in the blood  
D. Nitrogen coming out of solution in the blood
19. The brain activity during REM sleep is similar to that of an individual who is:  
a. In slow wave sleep                      b. Awake                      c. At rest                      d. Unconscious
20. Narcolepsy is:  
A. An inability to stop falling asleep when in sleep credit  
B. An inability to stop falling asleep when in sleep debit  
C. A cessation of breathing whilst asleep  
D. Sleepwalking
21. The lens is responsible for approximately.....of the total eye focusing ability  
a. 70% - 80%                      b. 20% - 30%                      c. 50%                      d. 98%
22. Glaucoma is a disease which is caused by:  
A. Color blindness  
B. High pressure of the liquid of the eye  
C. Cataracts  
D. Double vision
23. One of the commonest cause of in-flight incapacitation is:  
A. Gastro-enteritis  
B. Hypoglycaemia  
C. Severe circadian dysrhythmia  
D. The common cold
24. The ossicles (the malleus, incus and stapes) are situated in:  
a. The inner ear                      b. Middle ear  
b. c. Outer ear                      d. Outer & middle ear
25. Strengthening and re organizing the human memory when learning new tasks is believed to occur in  
A. Slow wave sleep  
B. REM sleep  
C. Sleep stages 3 and 4  
D. Stages 1 and 2 stages

26. The Central Nervous System (CNS) consists of the:
- A. Brain and spinal chord
  - B. Brain and neurons
  - C. Neurons and synapses
  - D. None of the above
27. Body Mass Index is your:
- A. Height in meters over your weight in kilos
  - B. Weight in kilos over your height in meters
  - C. Weight in kgs over your height in meters squared
  - D. None of the above
28. Astigmatism is normally caused by:
- A. A lack of accommodation
  - B. A lack of vitamin A
  - C. A lack of empty field
  - D. A mis-shapened cornea
29. When the visual image is focused in front of the retina the condition is:
- A. Myopia
  - B. Hypermetropia
  - C. Presbycusis
  - D. Aerodantalgia
30. Slow wave sleep is a term used for:
- A. Stage 1 and 2
  - B. Stage 2 and 3
  - C. Stage 3 and 4
  - D. Stage 4 and REM
31. Referring to the BMI a man weighing 81 kgs and is 1.75 m tall would be
- A. Considered within the normal weight range
  - B. Considered to be over weight
  - C. Considered to be obese
  - D. Considered to be underweight
32. What is the effect of stress on performance?
- 1. It always reduces performance.
  - 2. Excessive stress weakens performance
  - 3. Optimum performance is obtained with optimum stress.
  - 4. Insufficient stress weakens performance.
- A. 1,3,4 is true
  - B. 1,3 is false
  - C. 2,3, is false
  - D. 2, 3,4 is true

33. The function of REM sleep is believed to be
- To refresh the body after exercise
  - To refresh body and brain following physical / mental activity
  - Assist in organizing the memory and helping to coordinate and assimilate new information
  - To exercise the brain so it is prepared for the next day
34. Concerning the atmosphere which of the following is not true
- The mixture of the gases of the atmosphere remains constant
  - The gases cover the earth up to 30,000 ft at the poles and 60,000 ft at the equator.
  - Within the atmosphere there is a decline in temperature of  $1.98^{\circ}\text{C} / 1000\text{ft}$
  - In the atmosphere pressure increases with altitude
35. Required oxygen for an individual experiencing a moderate workload at 37,000 ft can be provided by
- 100% oxygen under pressure
  - An oxygen / Air pressure
  - 100% oxygen
  - A mixture of oxygen and helium to balance the partial pressure
36. Which measure(s) will help to compensate hypoxia?
- Swim below 30ft before flying
  - Descend below 10,000ft
  - Breathe 100% oxygen
  - Climb to or above 10 000ft
- 2 and 3 are correct, 1 and 4 are false
  - 1, 2 and 4 are correct
  - 2 and 3 and 4 are correct
  - 1, 2 and 3 is correct
37. What does the duration of sleep depend on
- The number of hours awake prior to sleep
  - The mental and physical exercise taken prior to sleep
  - Timing i.e. when the temperature is falling
  - The quality and amount of REM sleep
38. Which of the following statement(s) is /are correct
- The retina has rods on its peripheral and cones on its central zone
  - The retina has cones and the crystalline lens has rods
  - The rods allow for night vision
  - The cones are located on the peripheral zone of the retina
- 2, 3
  - 4

- C. 1, 3
- D. 1

39. 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

40. The normal range of blood pressure is

- A. Systolic 120 mm HG and Diastolic 80 mm HG
- B. Systolic 80 mm HG and Diastolic 120 mm HG
- C. Systolic 120 mm HG and Diastolic 120 mm HG
- D. Systolic 80 mm HG and Diastolic 80 mm HG

41. You can overcome hyperventilation by breathing into a plastic or paper bag in order to

- A. To increase the amount of nitrogen in the lung
- B. To reduce blood pressure
- C. To raise the level of CO<sub>2</sub> in the blood as fast as possible
- D. To prevent you from exhaling too much oxygen

42. The amount of light allowed to enter the eye is controlled by the

- A. Cornea
- B. Retina
- C. Iris
- D. Fovea

43. Insomnia, a sleep disorder is divided into

- A. Psychological and Physiological
- B. Mental and Physiological
- C. Clinical and Situational
- D. Physiological and Clinical

44. Two factors affecting long term memory are

- A. Expectation and suggestion
- B. Repetition and echoism
- C. Amnesia and Anxiety
- D. Anxiety and concentration

45. Pain in the joints (“bends”), which suddenly appear during a flight, is symptoms of
- A. Hypoxia
  - B. Decompression sickness
  - C. Barotraumas
  - D. Air-sickness
46. What are the main limitations of short term memory? It is
- 1. Very sensitive to interruptions and interference
  - 2. Difficult to access
  - 3. Limited in size
  - 4. subject to loss of memory
- A. 2,4
  - B. 1,3,4
  - C. 1,2,3
  - D. 2,3
47. Slow wave sleep occurs
- A. During the low voltage brain activity
  - B. During sleep stages 3 and 4
  - C. As an individual first starts to sleep
  - D. During the dreaming stage of REM sleep
48. How many stages are there in a normal sleep cycle?
- A. 3 stages plus REM
  - B. 4 stages excluding REM
  - C. 3 stages including REM
  - D. 4 stages including REM
49. The parts of the eye responsible for night vision
- A. Is the cornea
  - B. Are the cones
  - C. Are the rods
  - D. Are rods and cones
50. Situational insomnia is
- A. An inability to sleep in normal favorable conditions
  - B. A condition which may be eased by taking many short naps
  - C. An inability to sleep due to an abnormal work patterns
  - D. An inability to sleep due to environmental distractions like noise



**SECTION B**

1. Define hypoxia and list **six** major signs and symptoms **8 marks**
  
2. (a) The human ear performs three functions in the body. Name them. **3 marks**  
  
(b) What is conductive deafness and what might cause it **4 marks**
  
3. (a) Mention the parts of an eye that enables it to achieve focus and explain how each of them achieves focus **8 marks**  
  
(b) Explain what causes (hypermetropia) long sightedness and (myopia) short sightedness in the human eye **8 marks**
  
4. (a) Explain the main differences between the long term memory and the short term memory **5 marks**  
  
(b) Explain how the capacity of the short term memory can be increased **6 marks**
  
5. Explain the differences and characteristics of Slow wave sleep and the REM sleep. **8 marks**