

HUMAN FACTORS FINAL EXAM FD 24

Answer all questions in part one.

Each question in part one has one mark.

PART 1

1. The part of the retina of a human eye with the highest visual acuity is
 - A. The optical nerve entry point
 - B. The fovea
 - C. The retinal optical focus point
 - D. The rod/cone balance point

2. The cabin pressure in a commercial pressurized aircraft is normally maintained at an equivalent atmosphere of
 - A. Always equivalent to sea level
 - B. Normally no exceeding 2,000 to 3000 ft
 - C. Normally no exceeding 6000 to 8000 ft
 - D. Normally no exceeding 10000 to 12000 ft

3. Why does excessive cold make a person more susceptible to hypoxia
 - A. The heart beats faster which uses up more oxygen
 - B. More energy is required when shivering therefore more oxygen is used
 - C. It lowers the temperature of the body which makes it less efficient
 - D. It lowers the temperature of the body especially the head which slows down the brain activity

4. The "Chokes" are associated with
 - A. NIHL
 - B. Decompression sickness
 - C. Blockage of the alveoli
 - D. Oxygen loss

5. How is the rate and depth of breathing controlled by
 - A. the amount of oxy-haemoglobin in the blood and lungs
 - B. the amount of haemoglobin 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. Hypotension is
 - A. High blood pressure
 - B. Low pulse rate
 - C. High pulse rate
 - D. Low blood pressure

7. Sleep apnoea
- Occurs more often in older people
 - Occurs when one is not able to prevent falling asleep even when in sleep credit
 - Most often occurs during REM sleep
 - Is cessation of breathing whilst asleep
8. The main factor in the focusing of the human eye is
- The cornea
 - The lens
 - The iris
 - The internal fluid in the eyeball
9. The chemical substance responsible for addiction to tobacco is
- The combination of nicotine ,tar and carbon monoxide
 - Tar
 - Nicotine
 - Carbon monoxide
10. 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
11. Which data compose the ICAO standard atmosphere?
- Density
 - Pressure
 - Temperature
 - Humidity
- 3, 4
 - 1,2, 3
 - 1,2, 4
 - 2,3,4
12. Symptoms caused by gas bubbles in the joints, following a decompression are called:
- Creeps
 - Leans
 - Chokes
 - Bends
13. The function of the Eustachian tube is to:
- Equalize the pressure between the outer and the middle ear
 - Equalize the pressure between the outer and the inner ear
 - Equalize the pressure between the inner and the middle ear
 - Equalize the pressure between the tympanum and the inner ear

14. You have been scuba diving to a depth of 35 feet. When can you next fly?
- A. After 24 hours
 - B. After 48 hours
 - C. After 12 hours
 - D. After 72 hours
15. The semicircular canal is part of the
- A. Outer ear
 - B. Middle ear
 - C. Ear drum
 - D. Inner ear
16. The factor which most increases risk of coronary disease is
- A. Lack of exercise
 - B. Family history
 - C. Obesity
 - D. Smoking
17. When focusing on distance objects
- A. The pupil gets larger
 - B. The shape of the lens gets more spherical
 - C. The shape of the lens gets flatter
 - D. The cornea gets smaller
18. 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
19. One of the causes of Conductive Deafness is:
- A. Long exposures to levels of noise in excess of 90 db
 - B. Age
 - C. A blow on the head with subsequent damage to the ossicles
 - D. Hypertension
20. The main function of the white blood cells is
- A. To contribute to the immune system of the body
 - B. To transport oxygen
 - C. To help in the process of clotting of blood
 - D. To contribute to good eye sight
21. Body Mass Index (BMI) is your:
- A. Height in metres over your weight in kilos

- B. Weight in kilos over your height in metres
- C. Weight in kgs over your height in metres squared
- D. None of the above

22. Required oxygen for an individual experiencing a moderate workload at 37,000 ft can be provided by

- A. 100% oxygen under pressure
- B. An oxygen / Air pressure
- C. 100% oxygen
- D. A mixture of oxygen and helium to balance the partial pressure

23. 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

24. The Systolic blood pressure is higher than Diastolic pressure and the normal reading for a healthy person is 120/80. Hypertension can lead to strokes.

- A. Is false as the Diastolic pressure is normally higher than the Systolic pressure
- B. Is false as the normal blood pressure is 180/90
- C. Is false because high blood pressure normally leads to heart attacks
- D. True

25. Concerning the atmosphere which of the following is not true

- A. The mixture of the gases of the atmosphere remains constant
- B. The gases cover the earth up to 30,000 ft at the poles and 60,000 ft at the equator.
- C. Within the atmosphere there is a decline in temperature of $1.98^{\circ}\text{C} / 1000\text{ft}$
- D. In the atmosphere pressure increases with altitude

26. The best method for losing weight is

- A. The use of appetite suppressants
- B. To eat less
- C. To take plenty of exercise
- D. To go on a crash diet

27. 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

28. The ossicles (the malleus, incus and stapes) are situated in:

- A. The inner ear

- B. Middle ear
- C. Outer ear
- D. Outer & middle ear

29. Referring to the BMI a man weighing 81 kgs and is 175 cm 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

30. 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

31. "Slow Wave" sleep occurs

- A. During low voltage / high frequency brain wave activity
- B. Sleep stages 3 and 4
- C. As an individual first starts to fall asleep
- D. During the dreaming stage of REM sleep

32. Situational insomnia is

- A. Inability to sleep in normal favorable conditions
- B. A condition caused by taking too many short naps during the day
- C. Inability to sleep due to circadian dysrhythmia
- D. Inability to sleep due to environmental noise

33. The earth's atmosphere consists of different gases of various concentrations. Match the following

- | | |
|-------------------|-----------|
| 1. Nitrogen | A. 0.03% |
| 2. Oxygen | B. 0.92% |
| 3. Carbon Dioxide | C. 20.95% |
| 4. Rare gases | D. 78.10% |

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

34. Presbycusis is an impairment of hearing due to
- A. Damage to the eardrum
 - B. Age
 - C. Damage to the semicircular canals
 - D. Damage to the Eustachian tube
35. 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
36. 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
37. 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
38. 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 in the blood
 - D. Shortage of carbon monoxide in the blood
39. The major factor which predisposes an individual to heart attack is
- A. Smoking
 - B. Family history
 - C. The amount of saturated fats in diet
 - D. Hypertension
40. Insomnia is divided into
- A. Psychological and physiological
 - B. Mental and physical
 - C. Clinical and situational
 - D. Clinical and physiological

PART 2

Answer any five questions

1. (a) State at least **four** functions of the circulatory system including blood
4 marks

(b) List and explain at least **four** important factors that determine the severity of and susceptibility to hypoxic hypoxia
8 marks
2. (a) Mention the **three** components that are the result of tobacco smoking. Explain the harmful effects of these components to the human body
9 marks

(b) Mention at least four major signs and symptoms of hypoxia.
4 marks
4. Explain the causes and correction of the following visual defects
 - i. Hypermetropia (Long sightedness)
 - ii. Myopia (Short sightedness)**8 marks**
5. (a) Explain **any two** of the following associated with signs and symptoms of Decompression sickness
 - i. Creeps
 - ii. Staggers
 - iii. Chokes**8 marks**

(b) Differentiate between **“Slow wave”** and the **“REM”** sleep
10 marks
6. Explain what would cause the following hearing impairment
 - i. Conductive deafness
 - ii. Noise Induced hearing loss
 - iii. Presbycusis**9 marks**