



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES**

**DEPARTMENT OF HEALTH SCIENCES**

<b>QUALIFICATION:</b> BACHELOR OF ENVIRONMENTAL HEALTH SCIENCES	
<b>QUALIFICATION CODE:</b> 08BOHS	<b>LEVEL:</b> 6
<b>COURSE CODE:</b> OHS611S	<b>COURSE NAME:</b> OCCUPATIONAL HEALTH AND SAFETY 2A
<b>SESSION:</b> JULY, 2022	<b>PAPER:</b> THEORY
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 100

<b>SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION QUESTION PAPER</b>	
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<b>INSTRUCTIONS</b>
<ol style="list-style-type: none"><li>1. Answer ALL the questions.</li><li>2. Write clearly and neatly.</li><li>3. Number the answers clearly.</li></ol>

**PERMISSIBLE MATERIALS**

NONE

**THIS QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)**

## SECTION A (30 MARKS)

### QUESTION 1

(10 MARKS)

Select the best answer

- 1.1 The sound level of one machine is 90 dB(A). A second identical machine also producing 90 dB(A) is installed next to it. What is the sound level when both machines are running: (1)
- A. 180 dB(A)
  - B. 135 dB(A)
  - C. 93 dB(A)
  - D. 87 dB(A)
- 1.2 Which of the following is not a type of ionizing radiation? (1)
- A. Gamma rays
  - B. X-rays
  - C. Beta rays
  - D. Ultra violet radiation
- 1.3 The part of the eye that is responsible for colour perception: (1)
- A. Conjunctiva
  - B. Rod cells
  - C. Lens
  - D. Cone cells
- 1.4 The human ear is most sensitive to which of the following sound frequency ranges? (1)
- A. 5 to 5 000 Hz
  - B. 20 to 20 000 Hz
  - C. 2 to 120 KHz
  - D. 500 to 6 000 Hz
- 1.5 A factory with water-borne reticulated sewerage system employs 560 workers. In terms of the regulations relating to the health and safety of employees at work, what is the minimum number of toilets the employer should provide to comply? (1)
- A. 56
  - B. 22
  - C. 11
  - D. 21
- 1.6 Effects of whole body vibration include all the following except: (1)
- A. Impotence
  - B. Increased heart rate
  - C. Increased blood pressure
  - D. Lower back pain

- 1.7 The gas laws best explain hyperbaric environments where the amount of gas dissolving in blood and body tissues increases due to increased partial pressure is: (1)
- A. Boyle's Law
  - B. Henry's Law
  - C. Dalton's Law
  - D. Charles's Law
- 1.8 The condition where the body is deprived of oxygen at high altitude, low pressure conditions is known as: (1)
- A. Hypoxia
  - B. Dysbarism
  - C. Decompression sickness
  - D. Barotraumas
- 1.9 The terms that describe radiation effects that are determined by the level of radiation dose the person is exposed to: (1)
- A. Probabilistic effects
  - B. Stochastic effects
  - C. Collective Dose effect
  - D. Deterministic effects
- 1.10 The following ionizing types has the shortest range (i.e. travels the shortest distance in exposed tissue) for the same initial energy: (1)
- A. Alpha particle
  - B. Beta particle
  - C. Gamma rays
  - D. X-rays

## **QUESTION 2**

**(10 MARKS)**

2. Indicate which statement is **true** and which one is **false**.
- 2.1 Ultra violet radiation can cause skin cancer (melanomas) in exposed workers. (1)
- 2.2 An increase in the number of red blood cells is a form of adaptation for people who live or work in high altitudes. (1)
- 2.3 Cooling of the body through evaporation is reduced when the air is saturated with moisture. (1)
- 2.4 Once a worker is acclimatized to heat stress, the worker can maintain that status for the rest of his working life. (1)
- 2.5 Filter A weighting is used in occupational noise measurements because it responds to noise in a similar manner as the human ear. (1)

- 2.6 Hyperthermia is a condition resulting from the body's exposure to extreme cold environment resulting in the body temperature falling below 35°C. (1)
- 2.7 Visual acuity describes the ability of the eye to adjust to a dark or light environment. (1)
- 2.8 In terms of the Namibian Health and Safety regulations, it is mandatory / compulsory for anyone handling, manufacturing, selling or storing chemicals to provide Material Safety Data Sheets for the chemical substances. (1)
- 2.9 When dealing with noise, an increase of 3dB will result in the doubling of sound energy. (1)
- 2.10 A health and safety representative can legally be held jointly liable with the Chief Executive Officer for the company's health and safety negligence. (1)

### **QUESTION 3**

**(10 MARKS)**

3.0 Match the terms in **Column A** with the most appropriate phrase or description in **Column B**.

	<b>Column A</b>		<b>Column B</b>	<b>Marks</b>
3.1	Luminance	A	Reduction of breathing rate to below 12 breaths per minute.	(1)
3.2	Audiometric test	B	Ringing or buzzing noise in ears following exposure to high noise levels.	(1)
3.3	Glare	C	The luminous flux that strikes a unit area.	(1)
3.4	Bradypnoea	D	Thermoregulatory failure resulting in core body temperature rising over 41°C.	(1)
3.5	Tinnitus	E	Condition in which the core body temperature drops to below the required or normal body temperature due to cold stress.	(1)
3.6	Illumination	F	Brightness within the field of vision exceeding the general level of brightness.	(1)
3.7	Octave Band Analyser	G	Amount of light reflected by a unit area surface. Also known as brightness.	(1)
3.8	Heat stroke	H	Period required for one half of a radioactive material to decay.	(1)
3.9	Physical half life	I	Checks for hearing threshold shift or loss in persons exposed to noise.	(1)
3.10	Hypothermia	J	Sound frequency analysis.	(1)

## SECTION B (20 MARKS)

### QUESTION 4

(15 MARKS)

- 4.1 Elaborate on the scope as well as the exceptions coverage of the Labour Act. No. 11 of 2007. [5]
- 4.2 In terms of the Labour Act and regulations applicable in Namibia, outline the procedure and criteria for selecting health and safety representatives in the workplace. (5)
- 4.3 Summarize the duties and rights of health and safety representatives. (5)

### QUESTION 5

(5 MARKS)

- 5.0 There are two types of vibration, hand-arm vibration (HAV) and whole body vibration (WBV). Exposure to HAV can lead to health effects commonly referred to as Hand-Arm Vibration Syndrome (HAVS).
- 5.1 What are the causes of HAVS? Give examples of three work tasks or equipment that may contribute to HAVS. (5)

## SECTION C (50 MARKS)

### QUESTION 6

(20 MARKS)

- 6.1 Name ten of Occupational Health and Safety Legal framework applicable in Namibia. [10]
- 6.2 Describe the measures you would take to improve and ensure good lighting (illumination) in the workplace. (10)

### QUESTION 7

(20 MARKS)

- 7.1 How is acclimatization of workers in hot environments normally achieved? (15)
- 7.2 Outline the control measures you would recommend to prevent and control of HAVS. (5)

### QUESTION 8

(10 MARKS)

- 8.1 Hearing loss is mostly at the frequency range of 4000 Hz and above, elaborate on the advise you would give to the management on the action they should take regarding the control of noise. (10)

**End of Examination paper**

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TOTAL: 100 MARKS