



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF HEALTH SCIENCES

QUALIFICATION : BACHELOR IN ENVIRONMENTAL HEALTH SCIENCES	
QUALIFICATION CODE: 08BOHS	LEVEL: 6
COURSE: OCCUPATIONAL HEALTH & SAFETY 2A	COURSE CODE: OHS 611S
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DURATION: 3 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION PAPER	
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THIS QUESTION PAPER CONSISTS OF 6 PAGES (Including this front page)

INSTRUCTIONS

1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.

PERMISSIBLE MATERIALS

None

SECTION A (30 MARKS)

QUESTION 1

(10 MARKS)

- 1.0 Select most appropriate answer from the options provided.
- 1.1 Lighting surveys in the work environment are usually done to determine: (1)
- A. Luminous intensity
 - B. Luminous flux
 - C. Illumination
 - D. Brightness
- 1.2 Which of these terms describe radiation effects which are determined by the level of radiation dose the person is exposed to? (1)
- A. Stochastic effects
 - B. Collective dose effect
 - C. Deterministic effect
 - D. Radioactivity
- 1.3 Presbycusis is a form of hearing loss due to: (1)
- A. Exposure to occupational noise
 - B. Exposure to chemicals (especially solvents)
 - C. Ear diseases or infections
 - D. Sensory hairs damaged with age
- 1.4 Which of these terms describe hearing lost due to loud noise? (1)
- A. Stochastic effects
 - B. Collective dose effect
 - C. Deterministic effect
 - D. Sociocusis
- 1.5 The purpose of Hearing Protection Devices is to : (1)
- A. Relieve employer from having to do noise control
 - B. Protect the worker from acquiring hearing loss due to noise exposure
 - C. Keep foreign bodies out of the ear
 - D. Allow the employer to increase production noise for better production throughout.
- 1.6 The purpose of audiometric test is to: (1)
- A. Identify employees who need hearing protection

- B. Minimize employer liability for hearing loss
- C. Identify employees with a temporary shift in hearing due to noise exposure
- D. Collect evidence of workers hearing loss

- 1.7 In a steel making factory with furnaces and red-hot metal rods, the main thermal hazard will be through: (1)
- A. Radiation
 - B. Conduction
 - C. Convection
 - D. Air conduction
- 1.8 Heat disorder which results from thermoregulatory failure in persons is known as: (1)
- A. Heat oedema
 - B. Heat syncope
 - C. Heat stroke
 - D. Heat exhaustion / cramp
- 1.9 The condition where there is physical damage to body tissues caused by a difference in pressure between air spaces inside the human body tissues and the surrounding fluids is known as: (1)
- A. Hypoxia
 - B. Dysbarism
 - C. Decompression sickness
 - D. Barotrauma
- 1.10 The total pressure exerted by a gaseous mixture is equal to the sum of the partial pressures of each individual component in a gas mixture. This is a definition of: (1)
- A. Charles' gas law
 - B. Boyle's gas law
 - C. Henry's gas law
 - D. Dalton's gas law

QUESTION 2

(10 MARKS)

- 2.0 Indicate which of the following statements is **True** or **False**.
- 2.1 The breathing rate of people exposed to low pressure environments increases to compensate for low oxygen diffusion. (1)
- 2.2 Isotopes are nuclides with the same atomic number but different mass numbers. (1)
- 2.3 A hyperbaric environment refers to a low altitude environment with increased barometric pressure. (1)
- 2.4 In terms of the Namibian Health and Safety legislation, it is not a requirement for organizations to have an Occupational Health and Safety policy. (1)
- 2.5 Employees should purchase and maintain their own Personal Protective Clothing and Equipment. (1)
- 2.6 The Labour Act requires that an employer pays Health and Safety representatives an allowance for conducting their duties at the work place. (1)
- 2.7 The biological half-life of a radio-active material in radiation refers to the time required for the number of radio-active atoms in a sample to decrease by one-half. (1)
- 2.8 The eye's ability to focus on near and distant objects is known as visual acuity. (1)
- 2.9 Occupational health and safety is premised (based) on disease and injury prevention rather than curative or treatment of workers. (1)
- 2.10 Heat acclimatized workers generally sweat less than their unacclimatized counterparts. (1)

QUESTION3**(10 MARKS)**

3.0 Match the statement in **Column A** to the corresponding concept(s) in **Column B**.
Write on your answer sheet the correct column A number with a correct column B letter.

	COLUMN A		COLUMN B	Marks
3.1	Shielding	A	Ringling sound in the ear following exposure to high noise level	(1)
3.2	Ototoxicity	B	Total pressure exerted by a gaseous mixture is equal to the sum of the partial pressures of each individual constituent gases	(1)
3.3	Boyle's Law	C	Electromagnetic radiation of longer wavelength than visible light	(1)
3.4	Hand arm vibration	D	Lower back pain	(1)
3.5	Whole body vibration	E	Hearing loss due to exposure to chemicals or drugs	(1)
3.6	Heat syncope	F	A protective barrier, usually of dense material that reduces the passage of radiation	(1)
3.7	Dalton's law	G	Heat Stress Index	(1)
3.8	Infra-red radiation	H	Heat disorder resulting in affected persons fainting	(1)
3.9	Tinnitus	I	Vibration white finger	(1)
3.10	WBGT	J	Volume of gas of fixed mass and temperature is inversely proportional to its pressure	(1)

SECTION B (40 MARKS)**QUESTION 4****(15 MARKS)**

- 4.1 Why is the A weighting often used when measuring sound levels? (2)
- 4.2 Explain concisely how sound is transmitted from its source and through the components of the ear. (5)
- 4.3 An employee is working in an environment where he is exposed to 98dB(A) noise level. The Safety Officer supplies him with earmuffs with a Noise Reduction Rating (NRR) of 30dB.
- A. Calculate the actual noise reduction this would offer. (3)
- B. Would the noise reduction offered be adequate to protect the employee from hearing loss? (2)

- 4.4 The noise level for a new pump is known to be 78d(B)A. The background noise level in the area where the pump is installed is 82dB(A). What is the overall noise when the pump is operating? (3)

QUESTION 5 (25 MARKS)

- 5.0 Differentiate the following Occupational Health and Safety terms:
- 5.1 Hazard and Half-life. (5)
- 5.2 Dose and Effective dose. (5)
- 5.3 Ionizing and non-ionizing radiation. (5)
- 5.4 Hypobaric and hyperbaric pressure environments. (5)
- 5.5 Alpha radiation and Beta radiation. (5)

SECTION C (30 MARKS)

QUESTION 6 (30 MARKS)

- 6.1 Discuss the following terms used in Illumination.
- a. Adaptation. (5)
- b. Accommodation. (5)
- c. Visual acuity. (5)
- d. Glare. (5)
- 6.2 Elaborate on the process you would use to carry out thermal stress assessment. (10)

Good luck!!