

**UNIVERSITY OF ESWATINI
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF GENERAL NURSING**

MAIN EXAMINATION, NOVEMBER 2019

COURSE TITLE: PATHOPHYSIOLOGY

COURSE CODE: GNS 603

TIME ALLOCATED: THREE (3) HOURS

MARKS ALLOCATED: 100

INSTRUCTION:

- **ANSWER ALL QUESTIONS**
- **ANSWER ALL QUESTIONS IN THE SEPARATE ANSWER-BOOKLET PROVIDED**
- **THERE ARE FOUR (4) QUESTIONS, EACH WORTH 25 MARKS**
- **THERE ARE EIGHT (8) PRINTED PAGES EXCLUDING COVER PAGE**

Instruction: For each part-question, 1.1 – 1.20, choose the most appropriate response and write in your answer booklet the corresponding letter only, in **capital letters**, e.g. 26 B. Each correct response carries 1 mark.

QUESTION 1

- 1.1 The structure of the chromosome that is involved in evasion of cellular senescence by cancer cells is?
- A. Telomeres
 - B. Centromere
 - C. Kinetochore
 - D. Chromatid
- 1.2 Translocation of chromosomes is the basis of most diseases in the body. Which of the following chromosomes are involved in the development of Ewing Sarcoma?
- A. Chromosome 21
 - B. Chromosome 11 and 22
 - C. Chromosome 18
 - D. Chromosome 13 and 21
- 1.3 Nomusa a 35-year-old woman who presents to your office with abrupt cessation of menses. On further investigation, a tumour of the anterior pituitary gland was identified which prevented the release of follicle stimulating hormone (FSH) which of the following cellular communication mechanisms is affected by the tumour?
- A. Paracrine signalling
 - B. Endocrine signalling
 - C. Exocrine signaling
 - D. Autocrine signalling

- 1.4 Luyolo was involved in a motor vehicle accident where he sustained a complete spinal cord injury. Which of the following explains why nervous cells injuries are permanent?
- A. Nerve cells are labile and enter G0 phase
 - B. Nerve cells are stable and enter the G0 phase
 - C. Cells move in and out of the cell cycle
 - D. Cells leave the cell cycle and remain active
- 1.5 A client presents to the clinical area with history of paralysis of the lower extremities, fever and loss of weight. The client reports no history of trauma. Further history indicate that the client is living with HIV and has defaulted antiretroviral therapy for 5months. Which of the following is the likely diagnosis of this client?
- A. Potts disease
 - B. Osteomyelitis
 - C. Osteoporosis
 - D. Chronic osteomyelitis
- 1.6 Primary cell-mediated disorders of the immune system cause severe problems with infections. Which of the following is a disease that involve primary mediated disorders of the immune system?
- A. DiGeorge syndrome
 - B. Y-linked hyper-IgM syndrome
 - C. X-linked agammaglobulinemia
 - D. Y-linked agammaglobulinemia
- 1.7 Which of the following explains compensatory hypertrophy?
- A. When the body increases its major organs during times of malnutrition
 - B. When one kidney is removed, the remaining kidney enlarges
 - C. When the body controls the myocardial growth by stimulating actin expression to enlarge the heart

- D. When the body stimulates gene expression to begin progressive decrease in left ventricular mass
- 1.8 Calcification of normal tissue of the lung, heart and blood vessels occur during periods of hypercalcaemia. Which of the following are major causes of hypercalcaemia?
- A. Diabetes mellitus and Paget's disease
 - B. Hypoparathyroidism and vitamin D intoxication
 - C. Hyperparathyroidism and immobilization
 - D. Immobilization and hypoparathyroidism
- 1.9 Inflammation plays a role in the pathogenesis of some diseases. In which of the following diseases does inflammation act as a pathogenesis?
- A. Osteoporosis
 - B. Osteogenesis imperfecta
 - C. Hydronephrosis
 - D. Rheumatoid arthritis
- 1.10 A young woman presents with signs and symptoms of urinary tract infection (UTI). The family nurse practitioner notes that this is the fifth UTI in as many months. What would this information lead the family nurse practitioner to believe?
- A. There is possible obstruction in the urinary tract
 - B. The woman has multiple sex partners
 - C. The woman takes too many bubble baths
 - D. The woman does not clean herself properly

- 1.11 Which of the following microorganisms is the common cause of lower urinary tract infection?
- A. *Staphylococcus saprophyticus*
 - B. *Pseudomonas aeruginosa*
 - C. *Escherichia coli*
 - D. *Staphylococcus aureus*
- 1.12 Nonhle comes to the office of the nurse practitioner with complaints of general body malaise, mild fever, and painful joints. The family nurse practitioner determines that the symptoms are too general. In which of the following stages of natural disease would you assign Nonhle to?
- A. Prodromal stage
 - B. Stage of overt disease
 - C. Convalescence stage
 - D. Stage of defervescence
- 1.13 A new born premature baby had to be put on a ventilator support because of difficulties to breath. Apparently her alveoli were collapsed. Which of the following statements can best explain this scenario?
- A. The baby has few or no type I pneumocytes
 - B. The function of the baby's type II pneumocytes is too low to sustain life
 - C. The baby's lungs are still too small to sustain life
 - D. The baby's respiratory muscles are still too weak to support spontaneous breathing
- 1.14 Which of the following best describes the events in vitiligo?
- A. Melanocytes in the skin are lost
 - B. The epidermal layer of the skin is lost
 - C. Melanocytes progressively produces too little melanin
 - D. The body lacks proteins and/or enzymes required to produce melanin

- 1.15 A client presents with blurred vision, severe headache and a painful red eye secondary to a road traffic accident in which he sustained head injuries that extends to the eye. Based on these findings, as a Family Nurse Practitioner, you will further investigate this client for possible _____
- A. Brain damage
 - B. Ciliary body dysfunction
 - C. Closed angle glaucoma
 - D. Open angle glaucoma
- 1.16 How best would you account for visual loss in presbyopia?
- A. Photoreceptors die with age, thereby reducing visual acuity
 - B. Volumes of vitreous and aqueous humour decreases, thereby affecting accommodation
 - C. The lens gradually loses their elasticity with age, thereby affecting accommodation
 - D. Proteins are gradually broken down and accumulate in the lens, causing opacity
- 1.17 Sam has been working in a grinding mill for too long, and now he can only hear loud sounds. Which of the following is likely to have happened to him?
- A. The tympanic membrane has hardened
 - B. The small bones in the middle ear have been deformed
 - C. Perilymph and endolymph have been used up
 - D. Receptors in the organ of corti have been downgraded

- 1.18 With regard to lung volumes and capacities, the amount of air that remains in the lungs at the end of a normal expiration is known as _____.
- A. Residual volume
 - B. Expiratory reserve volume
 - C. Functional residual volume
 - D. Vital capacity
- 1.19 According to Mendel's laws of inheritance, phenotypic manifestation of a gene that controls a single-gene trait in an offspring depends on _____.
- A. The position of the gene on the locus of the chromosome
 - B. The amount of the gene that has been inherited from the parent
 - C. The number of nucleotides and nitrogenous bases in the gene
 - D. The allele with which it is paired on the chromosomal locus
- 1.20 After a prolonged period of battling with hypertension, a client came presenting with coughing, wheezes, crackles and cyanosis, among other manifestations. It can be concluded that this client now has _____.
- A. Left-sided heart failure
 - B. Hypertensive emergency
 - C. Pneumonia
 - D. Right-sided heart failure

Instruction: For each of the statements 1.21 – 1.25 below, write down in your booklet the most appropriate word or phrase to fill in the blank space

- 1.21 Glaucoma can be classified as closed or open angle glaucoma based on the opening or closure of the _____ angle.
- 1.22 The three small bones that mediate transmission of the sound wave across the middle ear are collectively known as _____

- 1.23 The main cation that triggers the cardiac myocytes excitation-contraction coupling is _____
- 1.24 A physiological chemical substance that reduces tension on alveoli surface, thereby preventing alveoli from collapsing is known as _____
- 1.25 A sequence of three (3) nitrogenous bases in a gene, that code for a particular amino acid during the translation phase of protein synthesis is known as a _____

QUESTION 2

- 2.1 A motorist driving down a high mountain sustained a temporary hearing loss by the time he finished the slope.
- (a) Explain this hearing loss [3]
 - (b) Outline and explain a remedial measure to such a hearing loss [3]
- 2.2 Outline the main characteristic features of x-linked single-gene disorders [6]
- 2.3 Discuss the molecular basis of cancer growth in terms of the following;
- (a) Sustained angiogenesis [3]
 - (b) Evasion of apoptosis [3]
- 2.4 Mrs Zondwako is a 65 year old menopausal woman who presents with fever, difficulty moving after recovering from a minor surgical procedure following a fractured femur. Mrs Zondwako is later diagnosed with osteomyelitis.
- (a) Explain the pathophysiology behind the increased risk of fractures in menopausal women [3]
 - (b) Explain the mechanism of Mrs Zondwako's osteomyelitis [4]

QUESTION 3

- 3.1 Describe the mechanism of diabetic retinopathy [5]
- 3.2 Explain how medications and environmental toxins damage renal structures [5]
- 3.3 Describe the host defense mechanisms against the development of a urinary tract infection [6]
- 3.4 Discuss the multistep mechanism of carcinogenesis [9]

QUESTION 4

- 4.1 Food intake may alleviate or aggravate peptic ulcer pain. Discuss. [10]
- 4.2 Discuss the pathophysiology and clinical manifestations of right sided heart failure. [15]