CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN NURSING

NURS 224: HUMAN PATHOLOGY II

STREAMS: BSC. NURSING (Y2S1) **TIME: 2 HOURS**

DAY/DATE: TUESDAY 19/12/2023 **8.30 A.M. – 10.30 A.M.**

INSTRUCTIONS

- Do not write anything on the question paper.
- Mobile phones and any other reference materials are **NOT** allowed in the examination room.
- The paper has three (3) Sections. **ALL** the questions are compulsory
- Your answers for Section A (MCQs) should be on the first page of the answer Booklet.
- Number ALL your answers and indicate the order of appearance in the space provided in the cover page of the examination answer booklet.

SECTION A: MULTIPLE CHOICE QUESTIONS (20 Marks)

1. Severe haemolytic transfusion reactions commonly occur when:
   a) The transfused blood contains antibodies against the recipient cells.
   b) The recipient has a high titre of antibodies against the donor cells.
   c) Group A blood is transfused into Group AB recipients.
   d) Group O blood is transfused into Group A recipients.
2. Complement is involved in the pathogenesis of each of the following **EXCEPT:**
   a) Arthus reaction
   b) Erythroblastosis foetalis.
   c) Contact dermatitis
   d) Hemolytic transfusion ABO reaction

3. One week following an injection of aqueous penicillin, a patient develops joint pains, a red, pruritic skin rash, fever and lymphadenopathy. Presuming that the diagnosis of serum sickness is correct:
   a) The antibody involved is probably IgD
   b) The antibody involved is probably IgA.
   c) No antibody is involved, since this syndrome is secondary to a cell-mediated immune reaction.
   d) The serum concentration of complement would be decreased
4. The phase of cell cycle where DNA replication occurs is:
   a) G_1
   b) S
   c) G_2
   d) M
5. Plasma membrane receptors that activate signaling pathways usually by forming molecular dimers that result in protein phosphorylation reactions upon binding of their specific ligand are:
   a) Steroid hormone receptors
   b) Receptor tyrosine kinase
   c) Ligand gated ion channels
   d) G-protein coupled receptors
6. A healthy 22 year old woman undergoes a normal routine examination. A discrete firm rubbery, movable mass is found in the left breast. There is no axillary lymphadenopathy noted and the skin underlying the breast and the nipple is normal. The most likely neoplasm to be present in this woman is:
   a) Fibroadenoma
   b) Lipoma
   c) Leiomyoma
   d) Intraductal carcinoma
7. A lack of chromosomal shortening allows the malignant cells to undergo many divisions than normal cells. The enzyme responsible for this effect is:
   a) Reverse transcriptase

b) Topoisomerase
c) Telomerase
d) Tyrosine kinase

8. The mechanism that enables the tumor cells to evade immune destruction by lymphocytes ia:
   a) Expression of oncofetal antigens
   b) Up-regulation of caspace production
   c) Formation of blocking antibodies
   d) Down regulation of major histocompatibility (MHC) class I expression
9. Which of the following condition is likely to be statistically related to the development of malignancy:
   a) Bronchial asthma
   b) Uterine leiomyomas
   c) Ulcerative colitis
   d) Myocardial infarction
10. The check point that monitors the completion of DNA replication and is arrested by ionizing radiation resulting in increased numbers of chromosomal abnormalities is:
    a) G_2/M
    b) G_0/G_1
    c) G_1/S
    d) S/G_2
11. A 48 year old woman has a routine physical examination. A 4 cm diameter non tender mass is palpated in the right breast that appears fixed to the chest wall. A chest X ray shows multiple 0.5-2 cm nodules in both lungs. The TNM classification that best describes the stages of her disease is:
    a) $T_1N_1M_0$
    b) $T_2N_1M_0$
    c) $T_3N_0M_0$
    d) $T_4N_1M_1$
12. A condition associated with viral oncogenesis is:
    a) Retinoblastoma
    b) T cell leukemia

c) Prostate adenocarcinoma
d) Hepatic angiosarcoma

13. Malignant tumors contain reactive stroma and cells. Common leukocytes associated with malignant tumors include:
    a) Macrophage, Lymphocyte
    b) Lymphocyte, Neutrophil
    c) Neutrophil, Macrophage
    d) Neutrophil, Eosinophil
14. A clinical study involves patients diagnosed with carcinoma whose tumor stage is T4N1M1. The patients' survival rate 5 years from the time of diagnosis is less than 50%, regardless of therapy. The most likely clinical findings in this group of patients is:
    a) Obstruction
    b) Hypercalcemia
    c) Cachexia
    d) Endocrinopathies
15. The mechanism through which radiation therapy diminishes a tumor mass is by:
    a) Generation of free radicals
    b) Loss of blood supply
    c) Point mutation of DNA
    d) Secondary inflammation
16. Chromosomes involved in Robertsonian translocation are :
    a) Holocentric
    b) Submetacentric
    c) Metacentric
    d) Acrocentric
17. Turner syndrome does not occur in males with 44+Y chromosome complement because:
    a) The ovum is seldom devoid of X chromosome
    b) Fetus with 44+Y chromosome complement dies
    c) A male sperm does not penetrate X deficient ovum
    d) X chromosome is necessary for fertilization to occur
18. Leber's hereditary optic atrophy is caused by a mutation in :

a) Chromosome 21
b) Chromosome 12
c) Chromosome 18
d) Mitochondrial DNA

19. Which of the following conditions shows anticipation in paternal transmission:
    a) Fragile X
    b) Huntington
    c) Cystic fibrosis
    d) Marfan syndrome
20. A genetic disorder resulting from genomic imprinting is
    a) Fragile X
    b) Alkaptonuria
    c) Prader-Willi
    d) Thalassemia

SECTION B: SHORT ANSWER QUESTIONS (35 Marks)

1. Explain three (3) signaling mechanisms that are used by cells to communicate (6 marks)
2. Giving examples, explain two (2) types of signaling molecules that are involved in cell growth (4 marks)
3. Explain three (3) types of hypersensitivity reactions (6 marks)
4. Explain three (3) mechanisms through which tumor suppressor gene products prevent the development of neoplasms (6 marks)
5. State five (5) categories of tumor antigens (5 marks)
6. Enumerate four (4) effects of neoplasms (4 marks)
7. Outline the four (4) steps of tumor cell hematogenous metastasis (4 marks)

SECTION C: LONG ANSWER QUESTION (15 Marks)

1. All Mendelian disorders are the result of mutations in single genes that have large effects. These disorders usually follow the classic Mendelian pattern of inheritance.
    a) Explain three (3) types of point mutations that may result in Mendelian disorders (6 marks)
    b) Describe three (3) categories of mendelian disorders (9 marks)

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