THE UNIVERSITY OF ZAMBIA

SCHOOL OF MEDICINE

DEPARTMENT OF PATHOLOGY & MICROBIOLOGY

END OF YEAR EXAMINATION FOR ACADEMIC YEAR 2021/2022

GENERAL AND SYSTEMIC PATHOLOGY (MB CHB) PTM 4210

PAPER 1

17TH OCTOBER, 2022

COMPUTER NO:.....

TIME: THREE (3) HOURS

INSTRUCTIONS

1. Answer all questions on this paper.
2. Answer each question in a different/separate answer booklet.
3. Each answer sheet should be clearly labeled with the question number and with your computer number.

QUESTION 1

Haemostasis means "arrest of bleeding". What are the 5 factors that are involved in ensuring that that haemostasis is realized in the body? Describe mechanisms by which these factors can fail to function. (20marks)

QUESTION 2 — 20 marks

Discuss anemias under the following headings; in each case give appropriate examples:

i. **The definition**
ii. **Aetiological classification.**

QUESTION 3 — 20 marks

A 19-year-old male presents with a two (2) month history of weakness, fatigue, intermittent fever, and epistaxis. He was previously well with no history of illness. On examination he is pale, febrile (Temp 38°C), mild hepatosplenomegaly and gum hypertrophy. Full blood count shows a total white cell count (WCC) = $1.15x10^9$/L (4-$10x10^9$/L), Haemoglobin (HB) = 4.2g/dL (13-17g/dL) and platelets = $24x10^9$/L (150-$400x10^9$/L).

i. Give an interpretation of the full blood count results.
ii. What is the term used to describe the total white cell count in this patient?
iii. Give two (2) causes of a low total white cell count.
iv. What could the explanation be for the intermittent fever in this patient?
v. What could explain the epistaxis in this patient?

A bone marrow aspiration (BMA) and trephine biopsy are performed. The BMA is markedly hypercellular with predominance (67%) of intermediate to large cells with moderate cytoplasm with granules and Auer rods seen. Nuclei are of variable morphology with fine chromatin and prominent nucleoli. The trephine biopsy shows the same features. These cells express CD34, CD13, CD33, CD117 and are negative for TdT.

vi. What could explain the gum hypertrophy in this patient?
vii. What is the nature of the cells described in the BMA report?
viii. What is the definitive diagnosis in this patient?
ix. What further investigations would you request beyond what has already been provided?
x. What are the treatment options for your diagnosis in (8) above?

QUESTION 4

a. **Fill in a table to show the differentiating features between benign and malignant neoplasms. 12 marks**

	Feature	Benign	Malignant
1			
2			
3			
4			

b. **List the laboratory methods, with examples, for the diagnosis of cancer. 6 marks**

	Method	Example
1		
2		
3		

c. **The following questions are based on this clinical scenario.**

Jane Mwansa is a 60-year-old woman who presented to the hospital with complaints of a lump in the left breast. The lamp is not freely movable. She had menarche at 10 years of age and menopause at 55 years. She has no history of hormone replacement therapy. The Pathologist diagnoses the lump as an invasive ductal carcinoma of low grade.

i. Describe triple assessment for breast cancer. (3 marks)
ii. What is the most likely molecular profile of Jane's cancer? (2 marks)
iii. What is the molecular classification of breast cancer? (8 marks)
iv. What is the importance of testing breast cancer for Estrogen receptor, progesterone receptor and HER-2/Neu? (5 marks)
v. Occasionally, breast cancers are hereditary. Mention a genetic problem that predisposes to cancer which reportedly affected one famous Hollywood movie star. (2 marks).
vi. Not all breast lumps are malignant. Describe the morphology of a breast lump that typically affects young girls and young women. (2 marks.)

QUESTION 5 — 20 marks

A 75-year-old man has been experiencing headaches for the past 2 months. On physical examination, his vital signs are temperature of 37° C; pulse rate of 68/min; respirations of 15/min; and blood pressure of 130/85 mm Hg. He also complains of pain in the temporal area. His heart rate is regular, and there are no murmurs. His erythrocyte sedimentation rate is 100mm/hr.

a. What is the most likely diagnosis?
b. What is the likely pathogenesis of the above condition?
c. Which other vessels are likely to be affected?
d. A biopsy is performed along the affected artery in the temporal area, what histological features will be found?

QUESTION 6

A 40 year old woman presents at the University Teaching Hospital Obstetrics and Gynaecology department with a history of watery per vaginal discharge and postcoital bleeding. Visualisation of the uterine cervix demonstrates a destructive tumour. Previous screening by cervical smear done 4 years ago demonstrated atypical squamous cells with high grade features (High grade squamous intraepithelial lesion-HSIL). Unfortunately, the patient never followed up her results.

a. What is the most likely diagnosis with this current presentation? (5 marks)
b. What is the cause of this tumour? (5 marks)
c. Describe briefly the molecular pathogenesis of this tumour? (10 marks)

QUESTION 7

A 35 year old male, who is HIV positive presents to outpatient department with cervical lymphadenopathy. He gives a history of drenching night sweats, loss of weight and a productive cough. A biopsy of the lymph node is submitted and histology shows foci of activated macrophages (epithelioid cells), rimmed by fibroblasts, lymphocytes, histiocytes, occasional Langhans giant cells and central necrosis with amorphous granular debris.

a. What is the most likely diagnosis (2 marks)
b. List atleast 4 differentials (4 marks)
c. What are the systemic effects of inflammation (8 marks)
d. State three other investigations you would request for and give reasons (6 marks)

QUESTION 8

A 76 year old woman is brought to the University Teaching Hospital by her daughter who informs you that she has noticed that the mother has become forgetful of late. You examine her and notice that she has a tremor in her hand, masked facies, moves slowly, is rigid and has a stooped posture.

a. What is the most likely diagnosis? (2 marks)
b. List three (3) features that are diagnostic clinically (3 marks)
c. Which part of the brain is affected (5 marks)
d. If the patient happened to die and an autopsy is conducted, what changes on gross examination of this part of the brain would you see and why? (10 marks)
e. What histologic feature would you see in some neurons that would help confirm your diagnosis? (5 marks)
f. What is the histologic finding in (E) composed of? (5 marks)

QUESTION 9

A 22-year-old patient with diabetes mellitus comes to the Accident and Emergency department. She gives a 2-day history of vomiting and abdominal pain. She is drowsy and her breathing is deep and rapid. There is a distinctive smell from her breath.

a. What is the most likely diagnosis? (5 marks)
b. Which bedside tests could you do to help you to confirm this diagnosis? (5 marks)
c. Which laboratory tests would you request to help manage this patient? (5 marks)
d. What conditions are likely to precipitate the condition you mentioned in (a) above? (5 marks)

QUESTION 10 20 marks

A 34 year old woman consulted her gynaecologist 8 months after the birth of her third baby because her periods had not returned since the birth. The pregnancy had been normal, but the birth was complicated by a severe post-partum haemorrhage for which a transfusion had been necessary. The baby was bottle-fed because her breast milk had been insufficient. This was in contrast to her 2 previous infants, whom she had breast fed successfully for 9 months each.

The following results were obtained:

	Patients results	Normal levels
Prolactin	< 3 ng/mL	< 29
FSH	1.3 U/L	3 – 18
LH	< 1.0 U/L	1.4 - 47
TSH	0.25U/L	0.35 – 5.5
Free T4	5.6pmol/L	10 – 24
9 a.m. plasma cortisol	560 nmol/L	140 – 700

a. What diagnosis is indicated?

b. Explain the pathophysiology of the disorder in 'a'.

c. Which hormones does this patient require as replacement therapy?

d. What clinical manifestations might occur if no hormone replacements were given?

e. Would you expect to find hyperkalemia and acidosis in this patient, as occurs in Addisons disease?

THE END

Good luck