

- a. Large mononuclear cell resembling monocytes
- b. Mononuclear cell resembling histiocytes - *macrophages in spleen.*
- c. Mononuclear cell resembling megakaryocytes
- d. Mononuclear cells resembling erythroblast
- e. Small mononuclear cells resembling Lymphocytes

130. Severity of clinical symptoms of anaemia depends on all of the following Except:

- a. Speed of onset ✓
- b. Age ✓
- ? c. Gender
- d. Type of Hb
- e. Oxygen carrying capacity ✓

131. Which of the following is not associated with blood transfusion reaction:

- a. Urticarial rash ✓
- b. Fluid overload ✓
- c. Lymphocytosis ✓
- d. Pyrexia ✓
- e. Haemolysis ✓

132. Bone marrow aspirate is a mandatory laboratory investigation in Kenya for the diagnosis of one of the following.

- a. Congenital hereditary spherocytosis - ✓ *Microspherocytes*
- b. Pernicious anaemia ✓
- c. Iron deficiency anaemia ✓
- d. Autoimmune associated with renal failure.
- e. Spherocytosis ✓

133. Von Willebrand's disease is due to defect in

- a. Factor V
- b. Factor VII
- c. Factor VIII
- d. Factor II
- e. Factor I

Six year old is referred to KNH hematology clinic with the following: Pancytopenia, skeletal abnormalities, dermatological abnormality and failure to grow/to thrive.

134. This six year is not at risk to experience:

Bone marrow failure

- a. Bleeding ✓
- b. Infection ✓
- c. Both infection and bleeding ✓
- d. Features of polycythemia ↑
- e. Easy bruisability ✓

leucemia's anaemia

135. The laboratory investigation necessary does not include:

- a. WBC differential ✓
- b. Reticulocyte count ✓
- c. Peripheral blood film morphology ✓
- d. Red cell mass ✓
- e. ESR ✓

136. If familial type is considered one of the mandatory investigations will include:

- a. Chromosomal studies
- b. Cytogenetics
- c. Finger-printing
- d. Analysis for sex chromosome
- e. Genetic examination

137. At the Kenyatta National Hospital the bone marrow aspiration was attempted on this 6 year old boy and a dry tap obtained despite being performed by an experienced hematologist. The following examination must now be done:

- a. Fine needle aspiration
- b. Trepine bone marrow biopsy
- c. Liver aspirate
- d. Splenic aspirate
- ~~e. A repeat bone marrow at a different site~~

138. The following are features of Von Willibrands disease

- a. Inherited as sex-linked *x autosomal*
- b. Prothrombin test is prolonged *x*
- c. Activated partial thromboplastin time is normal *x* ↑
- d. Thrombin clotting time is significantly prolonged
- e. Bleeding time is prolonged

Factor 8

For the donor blood transfusion safety to be satisfactory the Kenya National Blood Transfusion Service undertakes several activities:

139. At the National Blood Transfusion Center the following policies are taken EXCEPT:

- a. Blood donation with regards to protection of the donor
- b. Blood handling
- c. Blood processing

- d. Blood utilization ✓
- e. Production of rules ✓

140. At the RBTC safety is factored at the following EXCEPT:

- a. Donor examination and screening ✓
- b. Deferment of donors
- c. Administration of questionnaire ✓
- d. Testing for hemoglobin level
- e. Testing of malaria parasite on the donor ✓

141. The main function of the BTU with regards to safety involves:

- a. Compatibility testing
- b. Following up of blood donors
- c. Monitoring recipients
- d. Ensuring product preparation ✗
- e. Use of products other than blood ✗

Kaposi's Sarcoma is known for the following:

142. Association with

- a. Hepatitis C virus
- b. Hepatitis B virus
- c. Hepatitis A virus
- d. HHV8
- e. Hepatitis D virus

143. Clinical manifestation depends on:

- a. Gender
- b. Age
- c. Anatomical position in the body
- d. Endemic form
- e. Epidemic form -

144. Is one of

- a. HIV 1 defining
- b. HIV 1 associated
- c. AIDs defining
- d. AIDs associated
- e. No association with HIV

Myelodysplasia - Hematopoietic stem cell ^{stem cells} ~~stem cells~~ + ~~fat~~

145. Is better described by the following:
- a. Qualitative and quantitative abnormalities of the cellular elements of blood
 - b. Qualitative alone
 - c. Quantitative alone
 - d. Only lymphocytes are affected ~~x~~ + *granulocytes.*
 - e. Is always congenital ~~x~~
146. The myelodysplastic syndrome aspect is characterized by:
- a. Hematological features alone
 - b. Clinical features alone
 - c. Clinical and laboratory features
 - d. Affects only adults
 - e. Affects only children
147. The investigations must always include all of the following EXCEPT:
- a. Trephine bone marrow biopsy
 - b. Bone marrow aspirate
 - c. Reticulocyte count
 - d. Liver biopsy
 - e. Blood Cells morphology

The Peripheral Blood Film:

morphology.

148. Enables the assessment of all the following EXCEPT:
- a. Red Blood cells ✓
 - b. White cells ✓
 - c. Platelets ✓
 - d. Cellular inclusion ✓
 - e. Hemoglobin abnormality
149. For the diagnosis of the following parasites EXCEPT:
- a. Leishman Donovan
 - b. Babesia ✓
 - c. Malaria ✓
 - d. Filariasis
 - e. Trypanosomiasis ✓
150. Demonstrates the following EXCEPT:
- a. Rouleux formation
 - b. Auto-agglutination
 - c. Red cell fragmentation
 - d. Platelet aggregation
 - e. Hemolysis



UNIVERSITY OF NAIROBI

UNIVERSITY EXAMINATIONS 2017/2018

LEVEL III EXAMINATIONS FOR THE DEGREE OF BACHELOR OF MEDICINE
AND BACHELOR OF SURGERY (6 YEAR PROGRAM)

HIP 305. GENERAL PATHOLOGY - WRITTEN PAPER

DATE: SEPTEMBER 28, 2017

TIME: 2:00 P.M. - 4:00 P.M.

INSTRUCTIONS

1. There will be 5 minutes reading time.
2. Enter your Registration number in all your answer books and scripts.
3. The examination consists of 2 parts.

PART A - MCQ

- (i) Each question has only one correct answer.
- (ii) Answer the questions in the answer sheet provided.
- (iii) If you do correction do so very clearly.

PART B - SAQ

- (i) Answer each question in a separate book.
- (ii) Number all your questions clearly.

PART A : MCQ

1. Initial event in atherosclerosis:
 - a) Intimal tear
 - b) Intimal injury
 - c) Fibrosis
 - d) Plaque rupture
 - e) Thrombosis

2. Macrophages in atherosclerosis ingest cholesterol using:
 - a) Oxidised LDL receptors
 - b) Scavenger receptors
 - c) Apo E receptors
 - d) Clathrin coated pits
 - e) Toll like receptors

3. Vascular endothelial lesion observed in pre-eclampsia/eclampsia:
 - a) Thrombosis
 - b) Pseudo - aneurysms
 - c) Vasculitis
 - d) Atherosclerosis
 - e) Endotheliosis

4. Which of the following changes are not observed in a tumour stromal micro environment?
 - a) Extracellular matrix build up
 - b) Increase in cancer associated fibroblasts
 - c) Increased extracellular matrix metalloproteinases
 - d) Decreased neutrophils
 - e) Angiogenesis

5. Diagnostic utility of circulating tumour cells:
 - a) Identifies the likelihood of growth of secondary tumour
 - b) Useful in liquid biopsies where sensitive sequencing based techniques are applied
 - c) Useful for analyzing tumour cell origin
 - d) They can be filtered in the IVC
 - e) Not useful for studies of inaccessible retroperitoneal neoplasm

6. Liquefaction necrosis is seen in:
 - a) Liver
 - b) Spleen
 - c) Focal bacterial infections
 - d) Testes
 - e) Lungs

7. The most common exogenous pigment is:
- Haemosiderin
 - Bilirubin
 - Silica
 - Carbon
 - Lipofuscin
8. Tissue macrophages found in the central nervous system are:
- Microglial cells
 - Astrocytes
 - Oligodendrocytes
 - Axons
 - Histiocytes
9. Vascular changes occurring as a result of malignant hypertension:
- Fibrinoid necrosis
 - Hyaline arteriosclerosis ✓
 - Vascular dilatation
 - Angiogenesis
 - Fibroblastic proliferation
10. Biochemical mechanisms involved in cell injury except:
- ATP depletion
 - Free radicals
 - Intracellular calcium metabolism
 - Defective plasma membrane
 - Intracellular sodium - potassium balance
11. White infarcts are likely to be seen in: (Infarcts)
- Kidney ✓, heart & spleen
 - Lung
 - Ovary
 - Testes
 - Brain
12. Following deep vein thrombosis the following may occur EXCEPT:
- Incorporation into venous wall
 - Contraction of thrombus allowing adequate blood flow
 - Complete lumen obstruction with swelling and warmth of involved leg
 - Lung infarction due to thrombo-embolus
 - Ipsilateral kidney infarct due to atherosclerosis

13. Epithelial tumours
- Form 20% of cancers
 - Malignant types usually spread through the blood stream
 - Not associated with paraneoplastic syndromes
 - Are always well differentiated
 - Commonest tumours in the head and neck region
14. Oddly named tumour:
- Squamous cell papilloma
 - Chorocarcinoma
 - Basal cell adenoma
 - Melanoma
 - Transitional cell papilloma
15. The following statement is NOT true about proto oncogenes induced by retroviruses:
- These retroviruses integrate into the host genome to promote proto oncogenes
 - Part of the viral genes is involved in viral replication using host reverse transcriptase
 - The viral genome replicates within the host cell
 - Part of the viral genome indirectly upregulates tyrosine kinase
 - Proto oncogenes frequently down regulate tumour suppressor genes
16. A thirty year old male mechanic presents to the chest clinic with three year history of cough and haemoptysis. A chest x-ray shows canon ball type opacities and sputum cytology shows atypical cells. Which of the following agents is NOT likely to be the genesis of these lesions?
- Benzidine
 - Bis (-2-chloroethyl) sulfide
 - Nicked
 - Chromium
 - ~~500~~ *SO₂*
17. Not a directly acting carcinogen:
- Griseofulvin
 - Nitroso urea ✓
 - Chlorambucil ✓
 - I-acetyl imidazole
 - Dimethyl carbamyl chloride ✓
18. The third step in the carcinogenic effect of Benzo (a) pyrenes (BAPS):
- Diol epoxides metabolized to epoxides by cytochrome p-450
 - BAPS metabolized to epoxides by cytochrome P450
 - Epoxides converted to diol epoxides by epoxide hychocylases
 - Diol epoxides react with DNA
 - Epoxides undergo a national institute of Health (NIH) shift to produce phenols

19. Fundamental changes in physiology of malignancy except:
- a) Evading apoptosis ✓
 - b) Self sufficiency in growth signals ✓
 - c) Sensitivity to anti-growth signals
 - d) Limitless replicative potential ✓
 - e) Sustained angiogenesis ✓
20. Natural plant with carcinogenic ability is:
- a) Betel nuts
 - b) Aflatoxin B
 - c) Nitrosamines
 - d) Griseofulvin
 - e) Aspergillus
21. Commonest ~~plant~~ source of irradiation with carcinogenic ability is:
- a) Nuclear fission
 - b) X-rays
 - c) Uv sunlight ✓
 - d) Radionuclide's
 - e) Atomic fall out
22. Cells found in chronic inflammation except:
- a) Neutrophil
 - b) Eosinophil
 - c) Plasma cell ✓
 - d) Histiocyte ✓
 - e) Lymphocyte ✓
23. Which valves are commonly affected by rheumatic fever?
- a) Tricuspid, mitral
 - b) Mitral, aortic ✓
 - c) Tricuspid, pulmonary
 - d) Aortic, pulmonary
 - e) Artificial valves, pulmonary
24. Which of the following are Anitschkov cells?
- a) Lymphocytes
 - b) Plasma cells
 - c) Eosinophils
 - d) Activated macrophages ✓
 - e) Langhan's giant cells

25. What pigment accumulates in the liver in cachexia?
- Haemosiderin
 - Bilirubin
 - Melanin
 - Lipofuscin
 - Ferritin
26. Secondary diabetes mellitus is caused by all except:
- Pheochromocytoma ✓
 - Cushing's syndrome ✓
 - Hypothyroidism
 - Acromegaly ✓
 - Glucagonoma ✓
27. A sixty year old female's reproductive hormones are expected to be:
- Normal FSH, Low LH and high estradiol
 - Low FSH, Low LH and high estradiol
 - High FSH, High LH and high estradiol *low*
 - High FSH, High LH and High estradiol
 - Normal FSH, Low LH and Low estradiol
28. A dynamic test was carried out in a patient using TRH to test the pituitary function. TSH levels were measured. Basal levels of TSH were low and there was no increase after injection of TRH. What is the diagnosis? *↓ TSH*
- Hypothalamic hypofunction
 - Hypopituitarism
 - Primary hypothyroidism ✓
 - Compensated hypothyroidism
 - Hashimoto's thyroiditis ✓
29. An oral glucose tolerance test was carried in 50-year old male patient. The fasting blood sugar levels were 6.6 mmol/L and 2 hour levels were 8.5 mmol/L. What is the diagnosis? *FB 5.6, 2h 8.5*
- Normal response
 - Diabetes mellitus
 - Insulinoma
 - Impaired glucose tolerance
 - Not diagnostic ✓
30. Hypoglycemia is caused by all except:
- Addison's disease
 - Primary hepatocellular carcinoma
 - Renal failure
 - Malabsorption
 - Hyperthyroidism

31. Empyema seen in early childhood may be due to a deficiency of:
- a) Fibrinogen ✓
 - b) α 1 anti hyptin
 - c) Caemloplasmin ✓
 - d) Haptoglobin ✓
 - e) α -feto prolesin ✗
32. Bence - Jones proteins are:
- a) Monoclonal heavy chains
 - b) Monoclonal light chains
 - c) Intact α globulins
 - d) α 2 macroglobulins
 - e) Tonus horsefall proteins
33. In multiple myeloma which one of the following proteins is elevated in plasma?
- a) Albumin
 - b) Haptoglobin
 - c) α L anti trypsin
 - d) γ - globulin ✓
 - e) α 2 globulin
34. Use of thiaside diuretics in the treatment of hypertension may lead to the following except:
- a) Hyperuricaemia ✓
 - b) Hypercalcemia ✓
 - c) Hyponatraemia ✓
 - d) Hyperkalemia ✓
 - e) Hyperglycemia ✓
35. Causes of hypernatremia include the following:
- a) Nephrotic syndrome ✓
 - b) Diabetes insipidus ✗
 - c) Liver failure ✓
 - d) Congestive cardiac failure ✓
 - e) Haemolysis ✗
36. A 25 year old male was found to have a serum potassium of 6.9 mmol/L. Possible causes of this include the following except:
- a) Insulin insufficiency ✓
 - b) Conn's syndrome ✗ - aldosterone deficiency.
 - c) Systemic acidosis ✓
 - d) Acute kidney injury ✓
 - e) Haemolysis in the sample ✓

37. Causes of hypocalcemia do not include
- a) Thyrotoxicosis
 - b) Tertiary hyperparathyroidism
 - c) Hypervitaminosis D
 - d) Chronic kidney disease
 - e) Sarcoidosis
38. The following observation is in keeping with suspected iron overload except
- a) Reduced total iron binding capacity
 - b) Increased serum ferritin
 - c) Increased transferrin saturation
 - d) Increased plasma iron
 - e) Increased serum transferrin
39. A blood specimen was collected in an EDTA tube which biochemical analysis can reliably be done using this specimen?
- a) Blood gas analysis
 - b) Calcium
 - c) Electrolytes
 - d) Hb Alc
 - e) Liver function profile
40. Which of the following is NOT a qualitative point of care test?
- a) Blood glucose
 - b) Hepatitis A antibody test
 - c) Malaria antigen test
 - d) Urine benzodiazepine
 - e) Urine pregnancy test
41. The rate limiting enzyme in the biosynthesis of haeme involves this enzyme:
- a) Coproporphyrinogen oxidase
 - b) Hydroxymethylbilane synthetase
 - c) 5 amino lavulinic acid synthase
 - d) Ferrochelatase
 - e) Uroporphyrinogen decarboxylase
42. What number of normal values for a parameter with Gaussian distribution will fall outside the $\pm 2SD$ from the mean: (95%)
- a) $\frac{1}{10}$
 - b) $\frac{1}{20}$
 - c) $\frac{1}{100}$
 - d) $\frac{1}{200}$
 - e) $\frac{1}{300}$

43. Cholesterol function in all the following except:
- a) Synthesis of vitamin D
 - b) Steroid hormone precursor
 - c) Bile acid precursor
 - d) Prostaglandin synthesis
 - e) Cellular membrane structure.
44. Approximately 70% of LDL – cholesterol is usually cleared from plasma through:
- a) Splenic sequestration
 - b) ABCA1 mediated transfer
 - c) SRB1 mediated transfer
 - d) Receptor mediated endocytosis
 - e) Bulk endocytosis
45. Which of the following vitamins is useful as an antioxidant?
- a) C
 - b) D
 - c) Niacin
 - d) E
 - e) Riboflavin
46. The pka for the phosphate buffer system is:
- a) 5.8
 - b) 6.8
 - c) 7.8
 - d) 8.8
 - e) 9.8
47. Inherited metabolic disorders associated with tyrosine metabolism DO NOT include:
- a) Albinism
 - b) Alkaptonuria
 - c) Congenital hypothyroidism
 - d) Maple syrup urine disease ✓
 - e) Phenyl ketonuria ✓
48. Which of the following is NOT usually suggestive of an inherited metabolic disorder when it occurs in childhood?
- a) Convulsions
 - b) Dysmorphic features
 - c) Failure to thrive
 - d) Hyperglycaemia
 - e) Metabolic acidosis

49. What is the pH of a blood sample which has a hydrogen ion concentration of 50 nmol/L
- a) 7.30
 b) 7.35
 c) 7.40
 d) 7.45
 e) 7.50
- $-\log[H^+]$
50. A test's negativity in the absence of the disease is referred to as:
- a) Accuracy of the test
 b) Negative predictive value
 c) Positive predictive value
 d) Sensitivity of the test
 e) Specificity of the test
51. Haemolytic anaemia - 3/1 spleen or BMA:
 Which one of the following is true regarding hereditary spherocytosis:
- a) Caused by an inherited defect in haemoglobin
 b) G-6 PD is the main defective enzyme
 c) Affects both men and women equally
 d) It's more frequent in blacks than whites
 e) It can not be treated by splenectomy
52. NOT TRUE about auto immune haemolytic anaemia:
- a) It may be due to drugs
 b) Always associated with pernicious conaemia
 c) May be associated with IgM antibodies in senim.
 d) May complicate B-cell chronic lymphocytic leukaemia
 e) Associated with a positive direct antiglobulin test
53. Spherocytes in the blood film is a feature of:
- a) Thalasaemia major
 b) Reticulocytosis
 c) G-6PD deficiency ✓
 d) Auto immune haemolytic anaemia ✓
 e) Sickle cell anaemia
54. NOT true concerning hypersplenism or cause:
- a) The cell count in the blood is increased
 b) Multiple myeloma
 c) Schistosomiasis
 d) Splenectomy can be valuable
 e) Common feature of liver disease

55. A 64 years old complete blood count results of Hb 19 gdl^{-1} WBC $35 \times 10^9 \text{ l}^{-1}$ plat $800 \times 10^9 \text{ l}^{-1}$. RBC $8 \times 10^{12} \text{ l}^{-1}$ Further relevant history include:
- Sex
 - Body weight
 - Duration of complaint
 - Smoking
 - Diet
56. The basic investigation to accompany these automatic generation is:
- Blood film evaluation
 - Septic screen
 - Serum levels of B₁₂, folate and iron
 - Bleeding time test
 - Phlebotomy
57. One of the following values of assessed will show an increase:
- MCV
 - MC it
 - Red cell mass
 - Oxygen saturation
 - MCHC
58. To assess further the changes the necessary test is:
- Reticulocyte count
 - Bone marrow aspirate
 - Trephine Bone
 - Differential WBC count
 - Splenic aspirate
59. One of the following investigation not helpful = the management of this case:
- Philadelphia chromose
 - Jak-2
 - Leucocyte Alkaline phosphate ✓
 - Neutrophil Alkaline phosphate ✓
 - Blood pH ✓
60. A 16 year old herdsboy has a massive splenomegabal is clinically suspected to have a parasite. The investigation for the cause does not include:
- Blood film
 - Bone marrow
 - Splenic aspirate
 - White blood cell morphology and differential
 - Stool culture

61. Rectal snip is for a patient suspected to have:

- a) Kalaza
- b) Malaria ✓
- c) Schistosomiasis
- d) Filariasis
- e) Trypanosomiasis

Transfusion³, haemoglobin structure².

62. The following blood type is regarded as a universal donor:

- a) A
- b) AB
- c) B
- d) O
- e) None of the above

63. The self-life of a unit of platelets is:

- a) 35 days at 2-6°C
- b) 5 days at room temperature ✓
- c) -19°C for 1 year
- d) -70 in glycerol for 3 years
- e) 24 hours at room temperature

64. Which one of these infectious agents is NOT tested for in blood products:

- a) Hepatitis C antibody ✓
- b) Hepatitis B ✓
- c) HIV I and II ✓
- d) Cholera
- e) Treponema palladium

65. A blood group O individual has:

- a) O antigen on the rbc's ✓
- b) O antibody in the serum ✗
- c) Both a and b antibody in the serum ✓
- d) No antibody in the serum
- e) A and B antigen on the rbc's ✗

66. The following is true regarding haemoglobin structure EXCEPT:

- a) The tertiary structure refers to folding of the α and β globin chains
- b) A molecule of haemoglobin can transport up to 16 oxygen molecules
- c) Free gamma (γ) chains can form homotetramers known as haemoglobin Bart's
- d) Haemoglobin has highest affinity for oxygen in presence of low 2,3 bisphosphoglycerate levels
- e) Bohr shift is the phenomena that occur when decreased pH causes haemoglobin to release oxygen into tissues

67. Abnormal haemoglobin variants include:
- a) Hb A₂
 - b) Hb f
 - c) Hb C
 - d) Hb Portland
 - e) Hb Gower I
- C, ED & S (abnormal)
68. In the coagulation cascade, the central molecule that has a role in the pathogenesis of disorders and future treatment intervention is:
- a) Fibrinogen
 - b) Tissue factor
 - c) Prothrombin activator
 - d) Hageman factor
 - e) Proaccelerin
69. The vitamin dependent factor includes the following except:
- a) Factor II
 - b) Factor VII
 - c) Factor X
 - d) Factor IX
 - e) Factor XI
70. Plasmin inhibitors include:
- a) β_2 - antiplasmin
 - b) α_2 - macroglobulin ✓
 - c) Urokinase
 - d) Tissue plasminogen activator
 - e) Thrombin
71. Activated platelets produce the following on coming in contact with exposed collagen:
- a) Serotonin and thromboxane ✓
 - b) Von Willebrand factor
 - c) Tissue factor
 - d) Thromboxane and calcium
 - e) ADP and phospholipids
72. The normal levels of vit B₁₂ in serum is:
- a) 150-600 ng/L
 - b) 160 - 92 sng/L
 - c) 3 - 6 μ g/mL
 - d) 5 - 20 mg/l.
 - e) 100 - 500 mcg/ml

73. The absorption of vitamin takes place at the:
- a) Prodenum with intrinsic factor
 - b) Stomach using pancreatic preteases
 - c) Terminal ileum with intrinsic factor
 - d) Distal ileum without intrinsic factor
 - e) Colon with intrinsic factor, vit k and preteases
74. Serum homocysteine levels specifically increases in:
- a) Vit K deficiency
 - b) Vitamin B₁₂ deficiency
 - c) Folic acid deficiency
 - d) Iron deficiency anaemia
 - e) Combined Folic and Vit B₁₂ deficiency
75. Rich sources of iron include the following except:
- a) Meat
 - b) Cooked blood
 - c) Leafy vegetables
 - d) Milk
 - e) Poultry products

PART B - SAQ

1.a) Outline the three morphologic features of chronic inflammation. (5 marks)

b) Discuss epithelial tumours under the following:
i) Nomenclature
ii) Growth pattern
iii) An example each of the three (3) epithelial tissue types (5 marks)

2. A 3 year old is suspected to have haemolytic anaemia. The following are the blood counts:

Hb 6.5 g/dL ↓

WBC $20 \times 10^9/L$ ↑ *Acute bleed*

Platelets $496 \times 10^9/L$ ↑

MCV 97 fl - ~

MCH 31 pg - ~

MCHC 33 g/dL - ~

i) Comment on the above results. (3 marks)
ii) Give two (2) causes of haemolysis in this patient. (2 marks)
iii) Outline relevant laboratory investigations. (5 marks)

3.a) Describe blood count and peripheral blood film features of a leukamoid reaction. (5 marks)

b) List 5 common causes of a leukamoid reaction. (5 marks)

4.a) Describe the mechanisms of formation of a primary haemostatic plug in an injured blood vessel. (5 marks)

b) Outline the tests that comprise the coagulation screen and give the relevance of each test. (5 marks)

5.a) Describe the etiological causes of endocrinopathies. (6 marks)

b) List the uses of the endocrine laboratory. (4 marks)

6.a) Describe the causes of hypercalcemia. (5 marks)

b) Describe the indications for therapeutic drug monitoring. (5 marks)

7.

The following performance characteristics were obtained for two markers in diagnosis of Rheumatoid arthritis.

	Sensitivity	Specificity
Rheumatoid factor	54%	98%
CRP	73%	78%

- i) Define the terms "sensitivity" and "specificity". (4 marks)
- ii) Based on these findings, describe the best utility of these two markers in Rheumatoid arthritis diagnosis. Give reasons. (6 marks)

UNIVERSITY OF NAIROBI
DEPARTMENT OF HUMAN PATHOLOGY
CLINICAL CHEMISTRY UNIT

Jyoti Patel

Kalua

DATE: 30/3/11

TIME: 2.00PM - 3.00PM

~~12/3/2011~~

INSTRUCTIONS

Circle the correct response
There is only one correct response

1. A patient with excess ADH production may present with:
a) Polyuria \times \leftarrow deficient ADH \times
b) Decreased plasma osmolality \times \uparrow causes release \times Natriuresis H_2O
c) Increased urine osmolality \times E
d) Increased urine sodium concentration \times N_{a^+}
e) Hyponatraemia \times
2. The following plays an important role in fluid homeostasis.
a) Calcitonin \times
b) Aldosterone \checkmark B
c) Erythropoietin \times
d) Calcitriol \times
e) Insulin \times
3. An arterial blood specimen only should be used for the following test:-
a) Liver function tests \times
b) Blood gas analysis \checkmark B
c) Thyroid profile \times
d) Lipid profile \times
e) Urea \times
4. PO₂ of less than 40mmHg is consistent with:-
a) Adequate oxygenation \times 100 mmHg 80-100 mmHg
b) Mild hypoxemia
c) Severe hypoxemia \checkmark
d) Alkalosis
e) Excessive PCO₂ in blood

11. What is the transferrin saturation in a normal subject?

- a) 10 %
- b) 22 %
- c) 25 %
- d) 50 %
- e) 33 % ✓

12. Oedema is mainly characterized by:-

- a) Intravascular fluid overload
- b) Increased free fluid in the interstitial space ✓
- c) Intracellular fluid overload
- d) Hyperproteinemic states
- e) Hyperkalemia

BGA:

13. The following can be calculated from the Henderson-Hasselbalch equation except;

- a) PH ✓
- b) PCO₂ ✓
- c) Total CO₂ X
- d) PO₂ ✓
- e) Bicarbonate ✓

$$pH = -pKa + \log \frac{[A^-]}{[base]}$$

14. Respiratory acidosis can be caused by the following drugs except:-

- a) Benzodiazepines ✓
- b) Cocaine ✓
- c) Morphine ✓
- d) Tubocurarine ✓
- e) Salicylates X alkalosis

15. The anion gap is increased in the following conditions except;

- a) Lactic acidosis ✓
- b) Diarrhea ✓
- c) Ketoacidosis ✓
- d) Uraemia
- e) Alcohol intoxication

$$B [Na+K] - [Cl+HCO_3]$$

16. The following BGA findings are from a patient admitted in ICU. pH - 7.60; PCO₂ - 38mmHg (35-45); HCO₃ - 40mmol/L (22 - 28).

This is in keeping with:-

- a) Metabolic acidosis X
- b) Metabolic alkalosis ✓
- c) Respiratory acidosis X
- d) Respiratory alkalosis X
- e) Mixed metabolic & respiratory alkalosis X

HCO₃ for metabolic

B

17. Cerebrospinal fluid (CSF) collected for the analysis of meningitis is collected in preservative

- a) EDTA
- b) Heparin
- c) None
- d) Fluoride ✓ ; glucose d
- e) Iodoacetate

18. The following are applications of medical laboratory results except;

- a) Management of patients in chronic illness T
- b) Testing for the presence of disease causing organisms T
- c) Completion of differential diagnosis T
- d) Indicative of response to treatment T
- e) Comparing with neighbouring laboratories F

19. Highlight the specimen useful for measurement of creatinine clearance test

- a) Urine collected over a period of 24 hrs ✓
- b) Urine collected overnight ✗
- c) Early morning urine A
- d) Random urine ✗
- e) Urine collected for a period not exceeding one hr. ✗

* 20. Whole blood can be useful for analysis of all of the following except;

- a) Blood gas analysis ✓
- b) Hormonal analysis b
- c) Lactate ✓
- d) Ammonia ✓
- e) Trace elements ✓

* 21. Most biochemical parameters usually present which type of distribution?

- a) Polymodal ✗
- b) Skewed ✗
- c) Bimodal ✗
- d) Kurtotic ✗
- e) Unimodal ✓

* 22. The following is a measure of central tendency when a distribution is not Gaussian

- a) Mean ✓
- b) Range ✓
- c) Variance ✓
- d) Median ✓ - skewed d
- e) Coefficient of variation ✓

normal curve

23. Which of the following can be used to transform non-symmetrical data to symmetry?

- a) Chi square
- b) Square root ~~x~~
- c) Correlation coefficient ~~x~~
- d) K-S index
- e) Grubb's method

24. The correct term used to describe "normal ranges" is; 1-2

- a) Confidence interval
- b) Reference ranges
- c) Normal reference ranges
- d) Reference interval
- e) Confidence range

25. Of the following which correctly represents a non-parametric statistic?

- a) F-test
- b) Chi square
- c) Mann - whitney U
- d) Student's 't' test
- e) Bartlett's test

26. The product of standard deviation divided by the mean of the method multiplied by 100% is also known as;

- a) Arithmetic mean
- b) Coefficient of variation
- c) Variance
- d) Standard deviation
- e) Index of skewness

(b) $\frac{SD}{\text{mean}} \times 100\%$

27. The preparation which may be used in the emergency treatment of hyperkalaemia include;-

- a) Calcium chloride
- b) Glucose with soluble insulin
- c) 50% dextrose ~~x~~
- d) Lente insulin infusion
- e) All of the above ~~x~~

Ca - gluconate = protect the hearts
(b) *Lente - human made form of insulin*

28. The following are clinical features of hypokalaemia;

- a) Peripheral oedema
- b) Polyuria
- c) Kussmaul's breathing
- d) Diarrhea
- e) None of the above

Metabolic acidosis

(b) \downarrow *weakness, hypotonia, digoxin tx, met. alkalosis, constipation.*

Cushing's / ACTH secretion by
 Pituitary
~~Adison's disease~~ Addison's disease / chronic adrenal
 insufficiency; ^{low} insufficient steroid production.

29. Causes of dilutional hyponatraemia include the following except:

- a) Cardiac failure ✓
- b) Liver failure ✓
- c) Nephritic syndrome ✓
- d) Conn's syndrome ✓
- e) Acute renal failure ✓

excess production of adrenal hormones ✓
 (aldosterone)
 Conn's hyperaldosteronism

ⓓ

30. The following hormone leads to an increase in renal tubular reabsorption of sodium:

- a) Cortisol ✓
- b) Atrial natriuretic hormone ✓
- c) Renin ✓
- d) Arginine vasopressin ✓
- e) Adrenaline ✓

ANP, BNP, CNP

ⓐ

c

Osmolality

- Affected by
 x no^l of solute
 or temp^o of solute



INSTRUCTIONS

1. Circle the correct response.
2. There is only one correct response for each question.
3. Do not guess. An incorrect response carries -1/2 mark.

20
/3

1. Vasopressin is a hormone that is secreted by:

- a) Kidneys *
- b) Anterior pituitary
- c) Posterior pituitary ✓
- d) Thymus *
- e) Pineal body *

B x C

2. The normal daily urine output in an adult is:-

- a) 300 - 500mls
- b) 500 - 1000mls
- c) 1000 - 2000mls ✓
- ~~d) 1500 - 2500mls~~ / adult ✓
- ~~e) 500-1500mls~~

E ✓

3. The following has least effect on sodium and fluid homeostasis:-

- a) Vasopressin ✓
- b) Aldosterone ✓
- ~~c) Cortisol~~
- ~~d) Atrial natriuretic peptide~~ ✓
- e) Thyroxine ✓

E ✓

4. The following analyte is predominantly intracellular:-

- a) Sodium *
- b) Chloride *
- c) Potassium ✓
- d) Urea
- e) Glucose

C ✓ K⁺

3.5 / 10
105
22

Which of the following statements is not true concerning fluid distribution in an adult male?

- 21/11/19
6/11/19
- a) Plasma contributes about 25% of extracellular fluid
 - b) One quarter of total body water is in the interstitium
 - c) Plasma is easily available for biochemical analysis
 - d) Males have relatively less fluid than females
 - e) Extracellular fluid is more than intracellular fluid

Intracellular - 28L
Extracellular - 10L
- Plasma - 3.5L
- Interstitial - 10L
- Transcellular - 0.5L

6. Dilutional hyponatraemia occurs commonly in the following conditions except:-

- 10/11/19
- a) Renal failure
 - b) Congestive cardiac failure
 - c) Liver failure
 - d) Excess ADH secretion
 - e) Acute gastroenteritis

7. Elevated levels of urea may be seen in the following conditions except:-

- Prerenal → ↓ GFR
Renal
Post renal →
- a) Acute dehydration
 - b) Renal failure
 - c) Severe liver disease
 - d) High protein intake
 - e) Upper GIT bleeding

8. The following is a cause of hyperkalemia:

- a) Acute renal failure
- b) Insulin administration
- c) Mineralocorticoid excess
- d) Severe diarrhea
- e) Cushing's syndrome

Hypo
- Mineralocorticoid excess (Cushing's, Conn's, carbonic dehydratase, liquorice)
- 920 XCS - CCF, nephrotic synd, liver dx with ascites, renal artery stenosis
- Transcellular K shift
- Addison's
- Aldosteron

9. The major protein associated with plasma iron transport is:-

- a) Apoferritin
- b) Ferritin
- c) Transferrin
- d) Apoprotein A1
- e) Apoprotein D1

33% → normal saturation

10. In data analysis, the measure of central tendency of that data when it is NOT symmetrical is:-

- a) Mean
- b) Range
- c) Median
- d) Variance
- e) Standard deviation

11. A confidence interval commonly used as an acceptance/rejection criteria for laboratory analytical runs is:-

- a) 68%
- b) 85%
- c) 95% ✓ 2 SD
- d) 99%
- e) 100%

12. In data where the number of observations are few; the best measure of variation is:-

- a) Variance
- b) Standard deviation
- c) Mode
- d) Range
- e) Mean

13. Which of the following statistics would be ideal while testing for significance between two means? t-test

- a) Student's 't' test → Experimental & stated mean
- b) F test (variances)
- c) Chi square
- d) ANOVA
- e) Correlation coefficient

14. While setting up reference ranges, which would not be an exclusion criteria while setting up health based reference ranges?

- a) Hypertension
- b) Diabetes
- c) Obesity
- d) Height ✓
- e) Genetic abnormalities

15. Which of the following is a measure of Gaussianity?

- a) ANOVA - used to analyse t_s among group means
- b) Correlation Coefficient **B**
- c) K-S index
- d) Wilcoxon's ranked sum - non-parametric
- e) Kruskal-wallis - non-parametric method of testing whether samples originated from same distribution

16. The following method is used to remove outliers from a mass of biological data:

- a) Dixon's δ Pierce (Logarithm & SD) Dixon's Q test - used for 12 v. Repetition of outliers
- b) Fraser's
- c) Grubbs' - assessed = σ variances
- d) Square root
- e) Logarithm

17. How many observations would be required while setting up a reference range for a parameter in which no other reference range has been determined?

- a) 40 - reference range made for
- b) 70
- c) 80
- d) 100
- e) 120

18. Of the following, which is associated with the highest concentration of iron in plasma?

- a) Cytochromes } 50%
- b) Catalase } 5%
- c) Peroxidase
- d) Haemoglobin $\checkmark - 50\%$ Ferritin 30% Myoglobin 7%
- e) None of the above

19. The following greatly influence iron absorption except;

- a) Oxygen tension in the intestinal cells
- b) Size of the body iron stores
- c) Marrow erythropoietic activity $\checkmark \uparrow$ erythropoiesis $\rightarrow \uparrow$ Fe
- d) Presence of ascorbate and phytates in the GIT \checkmark reduce
- e) High iron content in diet

26. Causes of hypercalcaemia include the following except:-

- a) ✓ Tertiary hyperparathyroidism
- b) ✓ Sarcoidosis (20 Abs 20 to vit D hypersensitivity)
- c) ✓ Hypervitaminosis D
- d) ✓ Use of thiazide diuretics
- e) ~~✓ Thyroidectomy~~ E Thyro → Thyrotoxicosis
hypothyroid

- hyper PTH
- Thyrotoxicosis
- Vit D intoxication
- Thiazide diuretics
• Sarcoidosis
• hyperparathyroidism

27. The following are causes of Hyperphosphatemia except:-

- a) ✓ Increased phosphate intake ✓
- b) ✓ Cell lysis e.g. rhabdomyolysis *crush injury*
- c) ~~✓ Lactic acidosis~~
- d) ✓ Intracellular phosphate loss e.g. in acidosis ✓
- e) ✓ Cytotoxic therapy ✓

28. The following are fixed acids except:-

- a) HCl
- b) Lactate
- c) ~~Carbonic acid~~ → volatile
- d) Sulphuric acid
- e) Acetoacetate

29. Metabolic alkalosis may be due to:-

- a) Addison's disease *def. ald.*
- b) High altitude
- c) ✓ Hypokalemia, *diuretics, D. RF*
- d) Cerebral trauma
- e) Paracetamol poisoning *acidosis*

Hypokalemia
 - Muscular: weakness, constipation/ileus, hypotonia, depression, confusion.
 - Cardiac: Arrhythmias, potentiation of digoxin toxicity. ECG changes (ST depression, T depression/inversion, prolonged PR interval, prominent U wave).
 - Renal: Impaired conc'n ability → polyuria, polydipsia → MB alkalosis.

30. Causes of hypocalcaemia include:

- a) ✓ Chronic renal failure
- b) ~~✓ Hypervitaminosis D~~ Def. X Deficiency
- c) ✓ Metastatic bone disease *hypercalcaemia*
- d) ✓ Primary hyperparathyroidism *hyper*
- e) ✓ Thyrotoxicosis *hyper*

31. Which of the following factors has least influence on serum calcium concentrations?

- a) Calcitonin ✓
- b) 1,25 dihydroxycholecalciferol
- c) Parathyroid hormone
- d) ~~24,25 dihydroxycholecalciferol~~
- e) None of the above

20. Iron overload is usually associated with:-

- a) Increased plasma ferritin ✓
- b) Decreased plasma ferritin ✗ - def
- c) Decreased plasma iron ✗ def
- d) Increased plasma transferrin ✗ def
- e) Increased plasma TIBC ✗ def

↑ TIBC
↑ plasma ferritin

21. The following results would be expected in iron deficiency except:-

- a) Decreased transferrin saturation ✓
- b) Decreased ferritin ✓
- c) Decreased plasma iron ✓
- d) Increased plasma transferrin ✓
- e) Decreased plasma TIBC ✗ ↑ E

22. Which of the following set of information is crucial for test ordering form?

- a) Gender, Age, Race, Diagnosis ✗
- b) Age, Diagnosis, Date, Religion ✗
- c) History, Diagnosis, Specimen, Date ✓
- d) Specimen, Date, Marital status, Gender ✗
- e) Skin colour, History, Hospital No., Race ✗

23. Name the blood specimen that would be appropriate for (serum protein) electrophoresis:-

- a) Heparinised
- b) Serum ✓
- c) Fluorinated
- d) EDTA
- e) Citrated

analyse with carrier prot -
e.g. thyroxine binding globulin
- cortisol binding globulin
- albumin

24. What would be the best preservative for spinal fluid (CSF) collected for routine biochemical analysis.

- a) EDTA ✗ preserves cellular comp
- b) Heparin ✗ least interference
- c) Iodoacetate
- d) Citrate
- e) Fluoride ✓ → inhibit glycolytic enzymes.

E 24 hr

25. Name the appropriate specimen for Creatinine clearance test.

- a) 24 hour urine ✓ A
- b) Fluorinated plasma ✗
- c) Stone ✗
- d) Serum ✗
- e) (Random urine) analysis ✗



Pathology

UNIVERSITY OF NAIROBI

UNIVERSITY EXAMINATIONS - 2012/2013

LEVEL II END OF YEAR EXAMINATIONS FOR THE DEGREE OF BACHELOR OF DENTAL SURGERY

GENERAL PATHOLOGY

MCO PAPER

DATE: Tuesday, 5th November, 2013

TIME: 2.00PM - 5.00PM

INSTRUCTIONS:

1. Answer as directed in each section of the paper.
2. Each question has only ONE correct response.
3. DO NOT GUESS.
4. If you make a correction, do so very clearly eg (A) ~~(A)~~
5. Enter your examination number and answer on the answer sheet provided.

8. Death notification form used in Kenya

- a) 602 form
- b) D1 form**
- c) A23 form
- d) Death certificate
- e) P3 form

9. An example of acute inflammation

- a) Lepranous leprosy
- b) Tertiary syphilis
- c) Cryptococcal meningitis
- d) Bee sting**
- e) Schistosomal cystitis

10. The following is not amorphologic form of acute inflammation

- a) Serous fluid formation in pulmonary TB
- b) Fibrinous deposition in rheumatic carditis
- c) Abscesses formation is post tooth extraction
- d) Fibrino suppurative inflammation in lobar pneumonia
- e) Granuloma formation around foreign body in lower leg**

11. Odontogenic tumors are of

- a) Mesenchymal origin
- b) Epithelial origin
- c) Glial origin
- d) Hemapoetic origin
- e) Rove origin

12. The following is true of soft tissue tumors

- a) Cells form tubular and glandular structures
- b) Cells produce keratin
- c) Cells grow in sheets and have thin walled vascular channels**
- d) Desmoplasia is often associated with these tumors
- e) Mucin production is a common phenomenon

13. Tumors associated with inherited tumor suppression genes except:

- a) Rabinoblastomas
- b) Familial adenomatous polyposis
- c) Wilms' s tumors
- d) Neurofibromatosis type I
- e) Burkitt lymphoma**

14. Cancers are best described as

- a) Benign epithelial tumors
- b) Malignant mesenchymal tumors
- c) Benign epithelial and mesenchymal tumors
- d) All types of malignant tumours**
- e) All Neoplasms

1. Does not occur during nuclei excesion and repair process in the G2 of the cell cycle

- a) Excision mutations
- b) Ligation of nucleotides
- c) Synthesis of nucleotide patch
- d) Deletion of damaged nucleotide
- e) Transcription**

2. Neoplasms commonly seen in patients treated for cancers using radiotherapy

- a) Fibrosarcoma
- b) Hepatocellular carcinoma
- c) Squamous cell carcinoma of the uterine**
- d) Squamous cell carcinoma of buccal

3. A stable cell

- a) Epidermal cell
- b) Hepatocytes**
- c) Neuron
- d) Colonic mucosal cell
- e) Transitional epithelia cell

4. Not an effect of radiation injury

- a) Hyperchromasia
- b) Pleomorphism
- c) Increased mitoses**
- d) Apoptosis
- e) Intracellular eosinophilic bodies

5. The following occurs in the S-phase of cell cycle

- a) Diminished RNAs content
- b) Diminished DNA pairs
- c) 1st Resting phase
- d) Cell division phase
- e) Increased protein synthesis**

6. Not a common complication of HIV/AIDS patients in CDC stage IV

- a) Cardomyopathy
- b) Deep venous thrombosis
- c) Meningoencephalitis
- d) Blindness due to cataract**
- e) Blindness due to retinopathy

7. Commonest life threatening fungal infection in HIV/AIDS

- a) Cryptococcus neoformans**
- b) Oral Candidiasis
- c) Actinomyces species
- d) Maduromycetoma
- e) Aspergillus neoformans

22. Breast carcinoma usually spreads to axillary lymph nodes via
- Lymphatic spread
 - Haematogenous spread
 - Seeding
 - Direct spread
 - Metaplasia
23. Haematogenous spread of tumours is favoured by
- Schwannomas
 - Sarcomas
 - Chondromas
 - Haematomas
 - Melanomas
24. True about dysplasia
- Means cancer
 - Always leads to cancer
 - May be reversible
 - Carcinoma in situ is moderate dysplasia
 - Does not involve epithelium
25. Malignant tumours arising from epithelium
- Sarcoma
 - Carcinoma
 - Chondroma
 - Choristoma
 - Hamastoma
26. Malignant tumour
- Melanoma
 - Fibroma
 - Chondroma
 - Adenoma
 - Ameloblastoma
27. In congestive heart failure, oedema occur as a result of:
- Secondary aldosteronism
 - Lymphatic obstruction
 - Reduced plasma osmotic pressure
 - Increased vascular permeability
 - Raised antidiuretic hormone levels
28. Activation signals for macrophages include the following except:
- Bacterial endotoxin
 - Microbial products
 - Interferon-gamma
 - Fibronectin
 - Interleukin (IL-12)
15. A malignant tumor previous treated to remission with cytotoxic drugs recurs, the likely explanation
- Tumour acquiring new genetic mutation that make it resistant to current treatment
 - Tumour that was not sensitive to initial treatment
 - Host response that does not allow tumour to be cleared
 - A mutation of P53 gene
 - Tumour has acquired a Ras gene mutation
16. Not a mechanism of cell injury due to radiation exposure
- Protein-adduct formation
 - Peroxidation of lipid membranes
 - Double standard chromosomal breakages
 - Increase in aquaporins and osmotic lysis
 - Free radical oxidative injury
17. Not classified under the Chapel-Hill classification of vasculitis
- Churg-Strauss syndrome
 - Osler-Weber-Rendu syndrome
 - Temporal arteritis
 - Polyarteritis nodosa
 - P-ANCA associated microscopic polyangitis
18. Which of these infections are associated with small vessel vasculitis?
- Malaria
 - Marburg viral haemorrhagic fever
 - Tinea vesicolor
 - Staphylococcal toxic shock syndrome
 - Non-gonococcal urethritis
19. Cystic infarcts are usually found in the
- Spleen
 - Brain
 - Liver
 - Muscle
 - Intestine
20. The term neoplasia means
- Tumour
 - New growth
 - Swelling
 - Oncology
 - Study of cancer
21. A benign tumour arising in cartilage
- Chondrosarcoma
 - Chondroma
 - Chordoma
 - Chondrocarinoma
 - Chondroid myoma

36. A 7 year male has a rapidly growing mass in the mandible. A rapid diagnostic procedure would be
- An excisional biopsy
 - Chromosomal studies
 - A fine needle aspiration biopsy
 - A needle core biopsy
 - An ultra-sound guided incisional biopsy
37. A 70 year man has a pulsatile mass in midline of his lower abdomen. Most likely diagnosis is
- Angiosarcoma
 - Metastatic prostatic carcinoma
 - Kaposi's sarcoma
 - Aortic aneurysm
 - Arterio-venous fistula
38. Dystrophic calcification
- Occurs only in bone
 - Is a common cause of organ dysfunction after trauma
 - Hypocalcaemia is a common association
 - Occurs due to formation of crystalline calcium bicarbonate
 - Occurs in areas of any type of necrosis
39. Which public health intervention has resulted in the greatest impact on reduction of cancer mortality?
- Hepatitis B vaccine
 - Prostatic specific antigen (PSA) screening for men under 50 years
 - Urinalysis in steel industry workers
 - Prohibition of use of nickel fasteners in undergarments
 - Automation of chimney sweeping
40. Which is the least likely to give rise to subsequent carcinoma in the affected tissues?
- Atypical endometrial hyperplasia
 - Multiple colonic polyps
 - Oral leucoplakia
 - Low grade vaginal intraepithelial neoplasia
 - Multiple fibroepithelial polyps on the face
- Stem for Questions 41 - 44
A 9 year old is suspected to have acute myeloid leukaemia
41. The most unlikely finding on examination is erythema
- Cyanosis
 - Features of an infection
 - Palour of mucous membrane
 - Splenomegaly and/or hepatomegaly
 - Easy bruisability
29. Hypertension contributes to the pathogenesis of
- Coronary heart disease
 - Cerebro vascular accidents
 - Cardiac hypertrophy
 - Neoplasia
 - Aortic dissection
30. Factors associated with essential hypertension except:
- Smoking
 - Stress
 - Obesity
 - Heavy salt consumption
 - Being resident in Africa
31. Fibrinoid necrosis of the arterioles occur in:
- Malignant hypertension
 - Diabetes mellitus
 - Atherosclerosis
 - Congestive heart failure
 - Giant cell arteritis
32. A feature of irreversible cell injury:
- Plasma membrane blebbing
 - Loosening of intercellular attachments
 - Mitochondrial swelling
 - Nuclear shrinkage
 - Detachment of the ribosomes from the endoplasmic
33. In paraneoplastic syndrome thymoma is associated with
- Fever
 - Myasthenia gravis
 - Hypertrophic osteoarthropathy
 - Hypocalcaemia
 - Secondary amyloidosis
34. True of mutations except:
- May give rise to inherited diseases
 - May involve loss or gain of a whole or part of a chromosome
 - When they involve single base substitutions are called point mutations
 - Those affecting germ cells are transmitted to progeny
 - Defined as permanent damage to RNA
35. Not true of mendelian disorders
- Majority are recessive
 - Are result of single gene mutation
 - All have minor phenotypic affects
 - Up to 85% of mutation are familial
 - Every individual carries a small number of deleterious genes

- A type of cell characteristically present in Hodgkin's lymphoma is:
- a) Mast cells
 - b) Reed-Sternberg cell
 - c) Langerhan's giant cells
 - d) Gaucher cells
 - e) Sebaceous histiocyte
49. Oral manifestations of megaloblastic anaemia include:
- a) Adenoid hypertrophy
 - b) Red beefy tongue
 - c) Gum hypertrophy
 - d) Angular cheilitis
 - e) Dental caries
50. A useful disease marker in multiple myeloma is
- a) Serum albumin
 - b) Serum alkaline phosphatase
 - c) Monoclonal immunoglobulin
 - d) Polyclonal immunoglobulin
 - e) Serum calcium
51. The cause of the sickle shape in sickle cell anaemia is
- a) Abnormal rbc membrane structure
 - b) Defect in the vasculature
 - c) Abnormal rate of globin chain synthesis
 - d) Point mutation in red cell enzyme genes
 - e) Point mutation in β globin gene
52. The sickle cell crises is best defined as
- a) Hypoxic state causing sickling of red cell
 - b) Skeletal abnormalities seen
 - c) Increased intensity of what is occurring in the steady state
 - d) Increased jaundice
 - e) All the above are true
53. Diagnostic test in sickle cell anaemia is:
- a) Sickling test
 - b) Haemoglobin electrophoresis
 - c) Elevated LDH levels
 - d) Peripheral blood film appearances
 - e) b and c
54. The following one is not a physical feature associated with SCD
- a) Bowing of the skull
 - b) Splenomegaly
 - c) Proptosis
 - d) Non-healing leg ulcers
 - e) Hip joint deformity

42. The finding in the mouth that is suggestive of this type of leukaemia is
- a) Jaundice
 - b) Gum hypertrophy
 - c) Bleeding
 - d) Mouth sores
 - e) Palor
43. At the Kenyatta National Hospital the diagnostic process does NOT include:
- a) Blood film morphology
 - b) White cell differential count
 - c) Bone marrow examination
 - d) Cytogenetic studies
 - e) Complete blood count
44. One of the following if present confirms acute myeloid leukaemia
- a) Blast cells in bone marrow
 - b) Auer rods
 - c) Reduced haemoglobin level
 - d) Increased white blood cell count
 - e) Blast cells in the peripheral film
- Stem statement for Q45 - 47
- In Human Immune Deficiency Virus Infection (HIV)
45. A test which will show raised level is:
- a) CD₄ lymphocytes
 - b) Erythrocyte sedimentation rate (ESR)
 - c) Reticulocyte count
 - d) Total lymphocyte count
 - e) All blood cells
46. Bone marrow examination is NOT required in:
- a) Thrombocytopenia
 - b) Lymphoma
 - c) Myelodysplasia
 - d) Lymphopenia
 - e) Peripheral pancytopenia
47. One of the following malignancies is NOT likely
- a) Primary effusion lymphoma
 - b) Primary central nervous system lymphoma
 - c) Primary cavity Non-Hodgkin's lymphoma
 - d) Carcinoma of the tongue
 - e) Kaposi's sarcoma

61. A useful investigation in this patient

- a) Coagulation screen
- b) Bone marrow examination ●
- c) Hams test
- d) Coombs test ✓
- e) Sickling test

62. A likely diagnosis

- a) Immune Thrombocytopenia purpura
- b) Acute leukaemia ●
- c) Burkitt lymphoma ✓
- d) Multiple myeloma
- e) Chronic lymphocytic leukaemia ✓

63. Management of this patient will include:

- a) Surgery
- b) Radiotherapy
- c) Chemotherapy ●
- d) Speech therapy
- e) Tooth extraction

For Questions 64 and 65

A patient is sent to a Haematology and Blood Transfusion Laboratory for evaluation.

64. This is not likely to have problems with

- a) Red blood cells
- b) White blood cells
- c) Platelets
- d) Lipid profile ●
- e) Haemostatic or thrombosis

65. The haematologist has to perform all the following except.

- a) Comprehensive history taking ✓
- b) Systemic enquiry ✓
- c) Physical examination ✓
- d) New radiodiagnostic techniques ●
- e) Baseline investigations ✓

For Question 66 and 67

The patients who are seriously ill with query terminal illness:

66. Target cells are a characteristics feature in:

- a) Discharge them to the nearest hospital close to home
- b) Offer palliative care ●
- c) Hand them over to non-medical personnel ✓
- d) Ask the relatives what should be done ✓
- e) Are better off at home with relatives and friends ✓

55. Important aspects of comprehensive care of sickle cell disease includes all

- a) Education of parent/patient
- b) Psychosocial support
- c) Genetic counselling
- d) Multidisciplinary management
- e) Limitation of as much activity as possible ●

56. Features suggestive of a platelets disorder include all except

- a) Petechiae ✓
- b) Easy bruising ✓
- c) Purpura ✓
- d) Haemarthrosis ●
- e) Mucosal bleeding

*57. A 6 year old boy from the coast presents with a malignant jaw mass. The differential diagnosis in order of likelihood is

- a) Rhabdomyosarcoma, neuroblastoma, Burkitt lymphoma
- b) Burkitt lymphoma, rhabdomyosarcoma, Osteogenic sarcoma
- c) Fibrosarcoma, osteogenic sarcoma, Burkitt lymphoma
- d) Fibrosarcoma, lymphoma, rhabdomyosarcoma
- e) Burkitt lymphoma, fibrosarcoma, ewings sarcoma

58. Diagnosis of a suspected malignant maxillofacial tumor is best done by

- a) MRI of the lesion
- b) Fine needle aspiration cytology
- c) X ray of the lesion
- d) Biopsy and histology of the lesion ●
- e) CT scan of the lesion

For Q59 - 63

A 3 year old female child presents with bleeding and mild hepatosplenomegaly. The mother also reports recurrent fevers:

59. Initial investigation must include:

- a) Liver biopsy ✓
- b) Bone marrow aspirate
- c) Reticulocyte count ✓
- d) PBF examination ●
- e) Bilirubin estimation ✓

60. Clinical examination may further illicit:

- a) Jaundice
- b) Pallor ●
- c) Alopecia
- d) Skin rash
- e) Pathological fractures

4. Faecal haemoglobin consists of:
- 2 a and 2 gamma
 - 2 a and 2 epsilon
 - 2 a and 2 zeta
 - 2 a and 3 delta
 - 2 a and 3 beta
75. The following is useful in the management of Haemophilia A:
- Aspirin ×
 - Warfarin ×
 - DDAVP •
 - Prednisone ✓ ✓ ✓ ✓ ✓
 - Vitamin B₁₂ ×
76. The following drugs may predispose to abnormal bleeding during dental procedure:
- Steroids
 - Anti-Tuberculous drugs
 - Antimalarials
 - Warfarin •
 - Tranexamic acid
77. Total pain is composed of the following:
- Maximum amount of pain a patient can feel
 - The patient's pain and family members pain
 - Physical pain, social pain, psychological pain and spiritual pain experienced by the patient •
 - Physical pain, social pain, psychological pain and spiritual pain experienced by the patient and family
 - Pain of the wound, cancer and treatments
78. The following are strong opioids
- Tramadol
 - Codeine Phosphate
 - Fentanyl
 - Methadone
 - Morphine •
79. When breaking bad news, the following must be observed:
- Prepare the setting; A private comfortable interview room •
 - All the information must be given at once
 - A relative must be present
 - Documentation must be done
 - No emotions must be allowed to show

67. The preferred setting based management involves all of the following EXCEPT.
- Symptoms control ✓
 - Holistic control ✓
 - Drugs PRN ✓
 - A properly scheduled drugs for pain control ✓
 - Investigations may still be carried out •
68. The apparatus/instrument NOT useful in a Haematology laboratory is:
- Klima
 - Salah •
 - Jamshidi
 - EDTA container
 - Vacutainer with no additive
69. The stain least used in haematology laboratory is:
- Haematoxylin/Eosin ✓
 - Leishman ✓
 - May Grunwald Giemsa •
 - Prussian blue ✓
 - Brilliant creysl blue
70. Lymphocyte count expected in a normal 2-year old male:
- $4-11 \times 10^9/L$ ✓
 - $0.4-0.6 \times 10^9/L$
 - $5.2 \times 10^9/L$
 - $1.5-4.5 \times 10^9/L$
 - $2.5-8.5 \times 10^9/L$
- * 71. Investigation of megaloblastic anaemia includes the following
- Hams test ✓ ✓ ✓ ✓ ✓
 - Urinary methyl malonic acid estimation •
 - Shumm's test
 - Serum haemopexin assay
 - Serum LDH assay
72. A cause of lymphocytosis includes:
- Haemolysis
 - Viral infection •
 - Malaria infection
 - Bacterial infection
 - Post splenectomy
73. Megaloblastic anaemia is characterized by the following on Peripheral blood film EXCEPT
- Normoblasts •
 - Polychromasia
 - Bite cells
 - Hypersegmented neutrophils
 - Howell jolly bodies

87. One of the following relatives of a haemophilia patient is most likely to have haemophilia

- a) The father
- b) Maternal uncle •
- c) The sister ✓
- d) The grandmother ✓
- e) Paternal uncle

88. The following are 'labile' coagulation factors:-

- a) Factors I and II
- b) Factors VII and Factor IX
- c) Factors XII and Factor XI
- d) Factors V and VIII •
- e) Factor XIII

* 89. The following are features frequently associated with acute leukaemia except:-

- a) Spherocytes
- b) Elliptocytes
- c) Sideroblasts
- d) Blast cells ✓
- e) Schistocytes

90. The following operation may lead to a megaloblastic anaemia

- a) Jejunostomy
- b) Resection of the terminal ileum •
- c) Appendicectomy
- d) Resection of the colon
- e) Resection of the proximal ileum

91. Bombay phenotype individuals:

- a) Have antigens A and B in their red blood cells ✓
- b) Have antibodies A and B only in the serum ✓
- c) Lack ABO antibodies only in serum ✓
- d) Are universal recipients ×
- e) Are universal donors •

A^B
 $O_{as} \rightarrow$ Universal recipients

* 92. An individual grouped as Du positive: Du ~~test~~

- a) Is rhesus negative ✓
- b) Lacks all rhesus antigens ✓
- c) Is rhesus null phenotype ✓
- d) Is rhesus positive •
- e) Lacks some rhesus antigens

93. A cross-match will:

- a) Prevent immunization
- b) Detect errors in ABO-typing •
- c) Guarantee normal survival of donors rbc's in the recipient ✓
- d) Not detect errors in ABO grouping ×
- e) Is not important ×

80. The following IS NOT a routinely performed test in the haemostasis and the laboratory

- a) Prothrombin time
- b) Thrombin time
- c) Coombs test • ✓
- d) Bleeding time
- e) Fibrin time

81. Heparin therapy may be monitored by:

- a) Ivy's bleeding time
- b) APTT •
- c) INR
- d) Prothrombin time
- e) FDPs monitoring

82. The following are listed as natural anticoagulants EXCEPT

- a) Protein C ✓
- b) Protein S ✓
- c) Antithrombin III
- d) Heparin-2 Co-factor
- e) Lupus anticoagulant •

83. NOT a cause of folate deficiency

- a) Resection of the terminal ileum • B_{12} ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
- b) Chronic haemolysis
- c) Pregnancy ✓
- d) Tropical sprue ✓
- e) Resection of jejunum and duodenum

84. One of the following is not associated with Eosinophilia:

- a) Tropical Eosinophilia
- b) Hypereosinophilia
- c) Helminthiasis
- d) Chronic Granulocytic Leukaemia
- e) Typhoid •

85. Vitamin K is necessary for function of the following factors:

- a) VIII, X, V, II ✓
- b) X, XI, XII, XIII ✓
- c) II, VII, IX, X • ✓
- d) V, IX, X, XI ✓
- e) IX, X, XI, XII ✓

86. Causes of prolonged APTT could include all EXCEPT

- a) Factor VIII deficiency ✓
- b) Factor IX deficiency ✓
- c) Liver disease ✓ ✓
- d) Von Willebrand's disease ✓
- e) Factor XIII deficiency •

101. Neonatal screening is recommended for:-

- a) Congenital hypothyroidism *
- b) Cystinuria
- c) Wilson's disease
- d) Renal glycosuria
- e) Porphyria

102. Causes of metabolic alkalosis include:-

- a) Chronic renal failure
- b) Prolonged vomiting *
- c) Diarrhoea *
- d) Salicylate poisoning *
- e) Uncontrolled diabetes mellitus *

103. Haemolysis of a blood sample will cause pre-analytical elevation of the following except:-

- a) Aspartate transaminase
- b) Bilirubin
- c) Magnesium
- d) Phosphate
- e) Potassium

104. A biochemical test was found to have sensitivity of 98% and specificity of 74%. This test is suitable for:-

- a) Diagnosis
- b) Disease staging
- c) Screening
- d) Surveillance
- e) Treatment monitoring

105. Diabetic ketoacidosis (DKA) is a common complication in what type of diabetes mellitus?

- a) Type I diabetes mellitus *
- b) Type II diabetes mellitus
- c) Gestational diabetes mellitus
- d) Pheochromocytoma
- e) Achromegaly

106. Glycated albumin indicates glycaemia control over a period of:-

- a) 6 months
- b) 3 months *
- c) 1 month
- d) 2 weeks
- e) One day

94. Rhogam:

- a) Is a purified gamma D globulin
- b) Is a purified gamma E globulin
- c) Coats the maternal red blood cells *
- d) Lyses the maternal red blood cells
- e) Lyses abnormal fetal red blood cells

95. Substances that are capable of reacting with antibodies but do not stimulate antibody formation are called:

- a) Carrier molecules
- b) Haptens
- c) Immunogens
- d) Carbohydrates
- e) Immunoglobulins

96. Which lipoprotein is richest in total lipid content by weight

- a) Chylomicrons *
- b) IDL
- c) LDL
- d) VLDL
- e) HDL

97. All these are characteristics of type 1 diabetes mellitus except:

- a) Rapid onset
- b) Young age
- c) Depends on insulin for life *
- d) Obesity *
- e) Immune mediated

98. End product deficiency is a cause of clinical symptoms in :-

- a) Alkaptonuria
- b) c-21 hydroxylase deficiency
- c) Galactosaemia
- d) Lesch-Nyhan
- e) Phenylketonuria

99. The probability that a disease is absent when its diagnostic test is negative is:

- a) Accuracy
- b) Negative predictive value *
- c) Precision
- d) Sensitivity
- e) Specificity

100. Which of the following is not a monogenic disorder?

- a) Congenital adrenal hyperplasia
- b) Congenital hypothyroidism
- c) Down's syndrome *
- d) Hereditary haemochromatosis
- e) Wilson's disease

114. Of the following signs and symptoms, which one can not be attributed to vitamin A deficiency?
- Keratomalacia
 - Xerophthalmia
 - Bitot's spots*
 - Alopecia
 - Night blindness
115. A positive correlation exists between accumulation of remnant ^{Particulate} particles and development of atherosclerosis. The main constituent of these particles is:-
- Apo C
 - Apo A
 - Cholesterol esters*
 - Triglyceride
 - Phospholipids
116. The preferred specimen for analysis of blood gases is:-
- Venous blood
 - Arterial blood*
 - Ascitic fluid
 - Capillary blood
 - Serum
117. The confidence interval $\bar{x} \pm 2SD$ in a normal distribution will contain the following data percentage:-
- 68.2
 - 87.5
 - 90
 - 95.5*
 - 99.7
118. The following lipid parameter can be quantitatively calculated from Friedwald's equation.
- Total cholesterol
 - LDL - cholesterol*
 - Triglycerides
 - HDL - Cholesterol
 - Phospholipids
119. The following form of vitamin K is a provitamin:-
- Phylloquinone*
 - Menagquinone
 - Naphthoquinone
 - Dicumarol
 - Menadiolone

107. Identify the correct thyroid profile for secondary hypothyroidism.
- TSH, ↑T3, ↑T4
 - TSH, ↑T3, ↑T4
 - ↓TSH, ↓T3, ↓T4
 - ↓TSH, ↑T3, ↑T4
 - ↑TSH, ↑T3, ↑T4
 - TSH, ↓T3, ↓T4
108. Secondary causes of diabetes mellitus include all except:
- Phaeochromocytoma
 - Acromegaly
 - Cushing's disease
 - Addison's disease*
 - Glucagonoma
109. The metabolic process which decrease blood glucose levels is:-
- Glycolysis*
 - Gluconeogenesis
 - Proteolysis *
 - Lipolysis *
 - Glycogenolysis
110. The best preservative for glucose estimation is:-
- Citrate
 - Heparin
 - Oxalate
 - None
 - Fluoride*
111. The levels of plasma glucose diagnostic of diabetes mellitus in a random samples is:-
- 7.8 mmol/L
 - 10.2 mmol/L
 - ≥ 11.1 mmol/L*
 - 2.2 mmol/L
 - 3.2 mmol/L
112. Copper accumulation in various organs is a genetic condition usually seen in:-
- Menke's syndrome*
 - Xerophthalmia
 - Wilson's disease
 - Wernicke's encephalopathy
 - Nephrotic syndrome
113. Up to 30% of LDL-cholesterol is cleared from plasma by the following mechanism:
- Endothelial sequestration
 - Bulk endocytosis
 - Receptor mediated endocytosis*
 - HDL-receptor mediated pinocytosis *
 - Cholesterol ester protein transfer *

The total body iron in an adult male is:-

- a) 3 - 4 grams •
- b) 13 - 14 grams
- c) 6 - 10 grams
- d) 15 - 20 grams
- e) 10 - 12 grams

128. Causes of hypocalcaemia include the following:-

- a) Adrenal failure
- b) Sarcoidosis ✓
- c) Tuberculosis ✓
- d) Milk alkali syndrome
- e) Acute pancreatitis •

129. Hyponatraemia may be due to the following:-

- a) Addison's disease - ~~hypoparathyroidism~~ - ~~hypothyroidism~~ ✓
- b) Severe hyperglycaemia
- c) Excess vasopressin - ~~water~~ - ~~diarrhoea~~ ✓
- d) Conn's syndrome - ~~Adrenalitis~~ - ~~lung~~ ✓
- e) Haemolysis

130. An adult healthy male weighing 70 kg has:-

- a) 40 litres of total body water
- b) 28 litres of fluid in the intracellular compartment •
- c) 15 litres of fluid in the extracellular compartment •
- d) 2.5 litres of fluid in the interstitium •
- e) Plasma volume of 5.5 litres

131. Hypercalcaemia may develop in the following conditions:- except?

- a) High phosphate intake ✓
- b) Pseudohypoparathyroidism •
- c) Vitaminosis D
- d) Tertiary hyperparathyroidism
- e) Chronic renal failure

132. Antibodies fall into which category of serum proteins?

- a) Albumin
- b) Beta globulins
- c) Alpha globulins
- d) Metalloproteins
- e) Gamma globulins •

133. Which of the following function is not performed by albumin?

- a) Maintenance of osmotic pressure ✓
- b) Bind thyroxine ✓
- c) Solubilization of glucose •
- d) Nutrition
- e) Transport of bilirubin ✓

120. A type of hyperlipidaemia associated with increased levels of remnant particles in plasma is described as:-

- a) Type I hyperlipoproteinemia
- b) Type IIa hyperlipoproteinemia
- c) Type III hyperlipoproteinemia
- d) Type IV hyperlipoproteinemia
- e) Type V hyperlipoproteinemia

121. The following are causes of preanalytical errors except:-

- a) Poor preparation ✓
- b) Delay in sending report to the doctor •
- c) Incomplete test order form ✓
- d) Haemolysis ✓
- e) Delay in delivering specimen to the laboratory ✓

122. A positive test for DNA in stool is indicative of:-

- a) Presence of pathogens such as bacteria ✓
- b) Malignant disease affecting the GIT •
- c) Malabsorption ✓
- d) Porphyria
- e) All of the above

123. The following is not a characteristic description of median

- a) Unique ✓
- b) Measure of central tendency ✓
- c) Easy to calculate ✓
- d) Repeats severally in a given data ✓
- e) Not affected by extreme values ✓

124. The following data parameter is not a measure of dispersion:-

- a) Range ✓
- b) Mode •
- c) Variance ✓
- d) Standard deviation ✓
- e) Coefficient of variation ✓

125. The following laboratory finding is compatible with iron overload:-

- a) Increased total iron binding capacity ✓
- b) Low transferrin levels ✓
- c) Increased levels of ferritin in plasma ✓
- d) Decreased amount of stainable iron in liver biopsy specimen ✓
- e) Increased levels of soluble transferrin receptor ✓

126. The following is a cause of hyperkalemia:-

- a) Insulin administration ✓
- b) Acute renal failure •
- c) Mineralocorticoid excess - ~~Adrenalitis~~ - ~~lung~~ ✓
- d) Severe diarrhoea ✓
- e) Cushing's syndrome ✓

140. A difference between organ-specific and non-organ-specific autoimmune disorders is that:
- Only in organ-specific autoimmune disorders is there greater incidence in women ✓
 - Associations with HLA are only seen in non organ-specific autoimmunity ✓
 - Circulating autoantibodies react with normal body components only in organ-specific autoimmune disorders ✓
 - It is only in organ-specific autoimmune disorders that autoantibody tests are of diagnostic value
 - Only in non organ-specific autoimmune diseases are anti-nuclear antibodies a frequent feature
141. Which of the following conditions would result from defects in neutrophil NADPH oxidase?
- Chronic granulomatous disease ✓
 - Chediak-Higashi disease
 - Leucocyte adhesion deficiency
 - Hashimoto's disease
 - Streptococcal infection
142. Rheumatoid factors are:
- DNA anti DNA immune complexes
 - Autoantibodies to IgM
 - Autoantibodies to complement ~~element~~
 - Autoantibodies to IgM
 - Any factor predisposing to rheumatoid arthritis
143. In type IV hypersensitivity reaction, the principal cell responsible for the immunopathology is the:
- Th1 lymphocyte ✓
 - Plasma cell
 - Antigen presenting cell
 - Cytotoxic T lymphocytes
 - Activated macrophages
144. Successful immune response to bacteria which adhere to mucosal surfaces in order to initiate infection depends on the production of:
- Active complement
 - Armed effector CTLs
 - Neutralizing antibodies
 - Opsonizing antibodies ✓
 - Oxidative burst
145. One of the following best describes the immune combination to effect a type IV hypersensitivity reaction:
- Antigen presenting cell, Th1 lymphocytes and activated macrophages
 - Antigen presenting cell and activated macrophage
 - Antigen presenting cell and Th1 lymphocytes
 - Activated macrophage
 - Antigen presenting cell, Th1 lymphocyte

134. The following drugs induce hepatic microsomal enzymes except:
- Chronic ethanol ingestion ✓
 - Glucocorticoids
 - Griseovulvin
 - Carbamazepine
 - Cimetidine ✓
135. Which of the following is not a cause of indirect hyperbilirinaemia?
- Vitamin B₁₂ deficiency ✓
 - Wilson's disease
 - Gilbert's syndrome ✓
 - Rotor syndrome
 - Major ABO incompatibility reaction ✓
136. Which of the following is NOT found in the cytoplasm of natural killer cell
- Tumor necrosis factor alpha (TNF-alpha)
 - Lymphotoxin
 - Lysozyme ✓
 - TNF-beta
 - Perforin ✓
137. The following HBV vaccine formulation is now used as a standard practice
- Recombinant HBV/HBsAg protein produced by DNA technology (synthetic antigen vaccine)
 - Inactivated surface hepatitis B antigen (HBsAg) particles from chronic carrier of HBsAg (attenuated vaccine)
 - Live genetically altered recombinant virus (live recombinant viral vector)
 - "Naked DNA as a vaccine vector
 - Whole killed vaccine
138. A male infant is born at term. No congenital anomalies are noted on examination. A year later, he shows failure to thrive with frequent bacterial pneumonias. Both Haemophilus influenzae and Streptococcus pneumoniae were cultured from his sputum. Which of the following conditions is he most likely to have?
- Di George syndrome
 - Selective IgA deficiency
 - Epstein-Barr virus infection
 - Acute leukaemia ✓
 - X-linked agammaglobulinaemia
139. Which of the following involves the reaction between a soluble antibody and a particle-bound antigen?
- Immunoprecipitation
 - Agglutination
 - ELISA
 - Radio-immunoassay
 - Complement fixation

146. A five year old girl was noticed to have diarrhoea after ingesting meat. How would you term this condition?
- An autoimmune phenomenon
 - A case of malabsorption
 - A case of immunodeficiency
 - A case of food allergy
 - A case of food intolerance
147. The ability of a cytokine to change gene expression in the target cell is influenced by all of the following EXCEPT:
- Presence of high-affinity receptors on the target cell
 - Proximity of the producing and target cells
 - Presence of soluble cytokine receptor
 - Rate of transport of cytokine-receptor complexes into the cytoplasm
 - Simultaneous production of another cytokine whose receptor uses the same signal transduction subunit.
148. Hereditary angioedema is associated with one of the following
- Factor deficiency
 - C1q deficiency
 - C1 INH deficiency
 - Properdin deficiency
 - Decay accelerating factor (DAF) deficiency
149. The injection of large doses of protein results in the immune tolerance that is due to:-
- Removal of antibody by excess antigen
 - Catabolism of antibody by excess antigen
 - Production of non-reacting antibody
 - Suppression of non-reacting antibody
 - Induction of cytotoxic anti idiotypic antibodies
150. Endotoxin produced by Gramnegative and some Gram ^{positive} bacteria can contribute to septicemic shock in cases of bacteraemia. Which cytokine pair plays the leading role in the production of septicemic shock?
- α TNF and IL-1
 - IL-1 and IL-2
 - IL-2 and IL-4
 - IL-4 and IL-12
 - α TNF and IL-12

This was very easy!!!!



MBCBB II AND BDS II CLINICAL CHEMISTRY CAT
24TH MARCH, 2010
VENUE: CHIROMO CAMPUS
TIME: 2-3PM

INSTRUCTIONS

1. Circle the correct response.
2. There is only one correct response for each question
3. Do not guess. An incorrect response earns -1/2 mark

20
35

1. Vasopressin is a hormone that is secreted by:

- a) Kidneys *
- b) Anterior pituitary
- c) Posterior pituitary ✓
- d) Thymus *
- e) Pineal body *

g x c

2. The normal daily urine output in an adult is:-

- a) 300 - 500mls
- b) 500 - 1000mls
- c) 1000 - 2000mls ✓
- d) 1500 - 2500mls ✓ ~~output~~
- e) ~~500-1500mls~~

E ✓

3. The following has least effect on sodium and fluid homeostasis:-

- a) Vasopressin ✓
- b) Aldosterone ✓
- c) Cortisol
- d) Atrial natriuretic peptide ✓
- e) Thyroxine ✓

E ✓

4. The following analyte is predominantly intracellular:-

- a) Sodium *
- b) Chloride *
- c) Potassium ✓
- d) Urea
- e) Glucose

C ✓ K⁺

ECF = 15%
 ICF = 35%
 Plasma = 5%
 Interstitial = 10%
 (Total = 55%)

Which of the following statements is not true concerning fluid distribution in an adult male?

- a) Plasma contributes about 25% of extracellular fluid ✓
- b) One quarter of total body water is in the interstitium ✓
- c) Plasma is easily available for biochemical analysis ✓
- d) Males have relatively less fluid than females ✗
- e) Extracellular fluid is more than intracellular fluid ✗

C & E

Dilutional hyponatraemia occurs commonly in the following conditions except:-

- a) Renal failure ✓
- b) Congestive cardiac failure ✓
- c) Liver failure ✓
- d) Excess ADH secretion ✓
- e) Acute gastroenteritis ✗

$\frac{3.3}{14} \times 100$
 EV ✓

Elevated levels of urea may be seen in the following conditions except:-

- a) Acute dehydration ✓
- b) Renal failure ✓
- c) Severe liver disease ✗
- d) High protein intake ✓
- e) Upper GIT bleeding ✓

- low pressure (shock)
- CRF
- shock
- dehydration
- dehydration
- stress
- fever
- infection
- corticosteroids
- sympathomimetic bleeding
- ABF + CRF
- obstruction of drainage
- ↑ protein intake
- ↑ catabolism of protein

E & C

The following is a cause of hyperkalemia;

- a) Acute renal failure ✓
- b) Insulin administration ✗ (insulin causes hypokalemia)
- c) Mineralocorticoid excess ✗ (causes hypokalemia)
- d) Severe diarrhea ✗ (causes hypokalemia)
- e) Cushing's syndrome ✗ (causes hypokalemia)

A ✓

The major protein associated with plasma iron transport is:-

- a) Apoferritin
- b) Ferritin
- c) Transferrin ✓
- d) Apoprotein A₁
- e) Apoprotein D

C ✓

10. In data analysis, the measure of central tendency of that data when it is not symmetrical is:-

- a) Mean → Central tendency of non symmetrical data
- b) Range
- c) Median / mode → Central tendency of non symmetrical
- d) Variance
- e) Standard deviation

11. A confidence interval commonly used as an acceptance/rejection criteria for laboratory analytical runs is:-

- a) 68%
- b) 85%
- c) 95%
- d) 99%
- e) 100%

12. In data where the number of observations are few, the best measure of variation is:-

- a) Variance
- b) Standard deviation
- c) Mode
- d) Range
- e) Mean

13. Which of the following statistics would be ideal while testing for significance between two means?

- a) Student's t test
- b) F test
- c) Chi square
- d) ANOVA
- e) Correlation coefficient

14. While setting up reference ranges, which would not be an exclusion criteria while setting up health based reference ranges?

- a) Hypertension
- b) Diabetes
- c) Obesity
- d) Height
- e) Genetic abnormalities

15. Which of the following is a measure of Gaussianity?

- a) ANOVA
 - b) Correlation Coefficient
 - c) K-S index
 - d) Wilcoxon's ranked sum
 - e) Kruskal-wallis
- Handwritten notes:* Gaussianity, ANOVA, Correlation Coefficient, K-S index, Wilcoxon's ranked sum, Kruskal-wallis, Mann's, correct, n, indi, outliers from a mass of biological data, C ✓

16. The following method is used to remove outliers from a mass of biological data:

- a) Dixon's / Q test / cumulative
 - b) Fraser's
 - c) Levine's
 - d) Square root
 - e) Logarithm
- Handwritten notes:* Normal distribution, EFA

17. How many observations would be required while setting up a reference range for a parameter in which no other reference range has been determined?

- a) 40
 - b) 70
 - c) 80
 - d) 100
 - e) 120
- Handwritten notes:* already done - set up, D x E

18. Of the following, which is associated with the highest concentration of iron in plasma?

- a) Cytochromes
 - b) Catalase
 - c) Peroxidase
 - d) Haemoglobin
 - e) None of the above
- Handwritten notes:* D ✓

19. The following greatly influence iron absorption except:-

- a) Oxygen tension in the intestinal cells ✓
 - b) Size of the body iron stores ✓
 - c) Marrow erythropoietic activity ✓
 - d) Presence of ascorbate and phytyl in the GIT ✓
 - e) High iron content in diet ✓
- Handwritten notes:* E x D

20. Iron overload is usually associated with -

- a) Increased plasma ferritin ✓
- b) Decreased plasma ferritin ✓
- c) Decreased plasma iron ✓
- d) Increased plasma transferrin ✓ = ↓ iron
- e) Increased plasma TIBC ✓

A ✓

21. The following results would be expected in iron deficiency except -

- a) Decreased transferrin saturation ✓
- b) Decreased ferritin ✓
- c) Decreased plasma iron ✓
- d) Increased plasma transferrin ✓
- e) Decreased plasma TIBC ✓

↓ Ferritin

E ✓

22. Which of the following set of information is crucial for test ordering form?

- a) Gender, Age, Race, Diagnosis ✓
- b) Age, Diagnosis, Date, Religion ✓
- c) History, Diagnosis, Specimen, Date ✓
- d) Specimen, Date, Marital status, Gender ✓
- e) Skin colour, History, Hospital no., Race ✓

C ✓

23. Name the blood specimen that would be appropriate for serum protein electrophoresis:-

- a) Heparinised ✓
- b) Serum ✓
- c) Fluorinated ✓
- d) EDTA ✓
- e) Citrated ✓

D ✓

24. What would be the best preservative for spinal fluid (CSF), collected for routine biochemical analysis.

- a) EDTA ✓
- b) Heparin ✓
- c) Iodoacetate ✓
- d) Citrate ✓
- e) Fluoride ✓

C ✓

25. Name the appropriate specimen for Creatinine clearance test.

- a) 24 hour urine ✓
- b) Fluorinated plasma ✓
- c) Stone ✓
- d) Serum ✓
- e) Random urine ✓

A ✓

Dr. Arun

26. Causes of hypercalcaemia include the following except -

- a) Tertiary hyperparathyroidism ✓ $17 \times C$
- b) Sarcoidosis ✓
- c) Hypervitaminosis D ✓ E
- d) Use of thiazide diuretics ✓
- e) Thyroidectomy ✓ \rightarrow

27. The following are causes of Hyperphosphatemia except -

- a) Increased phosphate intake ✓ PH
- b) Cell lysis e.g. rhabdomyolysis ✓ $Chronic$
- c) Lactic acidosis ✓ $E \times B$
- d) Intracellular phosphate loss e.g. in acidosis ✓
- e) Cytotoxic therapy ✓ \rightarrow

28. The following are fixed acids except -

- a) HCl ✓
- b) Lactate ✓
- c) Carbonic acid - ✓
- d) Sulphuric acid ✓
- e) Acetoacetate - Fr

29. Metabolic alkalosis may be due to -

- a) Addison's disease
- b) High altitude - acid
- c) Hypokalemia ✓ $E \times C$
- d) Cerebral trauma - $Aspirin$
- e) Paracetamol poisoning - $Salicylate$

30. Causes of hypocalcaemia include:

- a) Chronic renal failure ✓ $A \times C$
- b) Hypervitaminosis D ✓
- c) Metastatic bone disease ✓
- d) Primary hyperparathyroidism ✓
- e) Thyrotoxicosis ✓

31. Which of the following factors has least influence on serum calcium concentrations?

- a) Calcitonin -
- b) 1,25 dihydroxycholecalciferol -
- c) Parathyroid hormone -
- d) 24,25 dihydroxycholecalciferol ✓ D
- e) None of the above.