UNIVERSITY OF NAIROBI

UNIVERSITY EXAMINATIONS 2017/2018

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

HHP 305 : GENERAL PATHOLOGY – WRITTEN PAPER

DATE: SEPTEMBER 18, 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 fear
   b) Intimal injury
   c) Fibrosis
   d) Plague rapture
   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-ectampsia leclampsia:
   a) Thrombosis
   b) Pseudo – aneurysms
   c) Vasculetis
   d) Atherosis
   e) Endothelrosis

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 t he 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:
   a) Haemosiderin
   b) Bilirubin
   c) Silica
   d) Carbon
   e) Lipofuscin

8. Tissue macrophages found in the central nervous system are:
   a) Microglical cells
   b) Astrocytes
   c) Oligodendrocytes
   d) Axons
   e) Histiocytes

9. Vascular changes occurring as a result of malignant hypertension:
   a) Fibrinoid necrosis
   b) Hyaline arteriosclerosis ✓
   c) Vascular dilatation
   d) Angiogenesis
   e) Fibroblastic proliferation

10. Biochemical mechanisms involved in cell injury except:
   a) ATP depletion
   b) Free radicals
   c) Intracellular calcium metabolism
   d) Defective plasma membrane
   e) Intracellular sodium – potassium balance

11. White infants are likely to be seen in:
   a) Kidney ✓
   b) Lung
   c) Ovary
   d) Testes
   e) Brain

12. Following deep vein thrombosis the following may occur EXCEPT:
   a) Incorporation into venous wall
   b) Contraction of thrombus allowing adequate blood flow
   c) Complete lumen obstruction with swelling and warmth of involved leg
   d) Lung infarction due to thrombo-embolus
   e) Ipsilateral kidney infarct due to atherosclerosis

13. Epithelial tumours:
a) Form 20% of cancers
b) Malignant types usually spread through the blood stream
c) Not associated with paraneoplastic syndromes
d) Are always well differentiated
e) Commonest tumours in the head and neck region.

14. Oddly named tumour:
a) Squamous cell papilloma
b) Chrorcocarcinoma
c) Basal cell adenoma
d) Melanoma
e) Transitional cell papilloma

15. The following statement is NOT true about proto oncogenes induced by retroviruses:
a) These retroviruses integrate into the host genome to promote proto oncogenes
b) Part of the viral genes is involved in viral replication using host reverse transcriptase
c) The viral genome replicates within the host cell
d) Part of the viral genome indirectly upregulates tyrosine kinase
e) Proto oncognes 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?
a) Benzidine
b) Bis (-2-chloroethyl) sulfide
c) Nicked
d) Chromium
e) 500 = 500

17. Not a directly acting carcinogen:
a) Griseofulvin
b) Nitroso urea ✓
c) Chlorambucil ✓
d) I-acetyl imidazole
e) Dimethyl carbamyl chloride ✓

18. The third step in the carcinogenic effect of Benzo (a) pyrenes (BAPS):
a) Diol eposides metabolized to epoxides by cytochrome p-450
b) BAPS metabolized to epoxides by cytochrome P450
c) Epoxides converted to diol epoxides by epoxide hychocylases
d) Diol epoxides react with DNA
e) Expoxides 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 source of irradiation ~~plant 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, mutral
b) Mitral, aortic ✓
c) Tricuspid, pulmonary
d) Aortic, pulmonary
e) Artificial values, pulmonary

24. Which of the following are Anitschkov cells?
a) Lymphocytes
b) Plasma cells
c) Gosinophils
d) Activated macrophages ✓
e) Langhan's giant cells

25. What pigment accumulates in the liver in cachexia?
a) Haemosiderin
b) Bilirubin
c) Melanin
d) Lipofuscin
e) Ferritin

26. Secondary diabetes mellitus is caused by all except:
a) Pheochromocytoma
b) Cushing's syndrome
c) Hypothyroidism
d) Acromegaly
e) Glucagonoma

27. A sixty year old female's reproductive hormones are expected to be:
a) Normal FSH, Low LH and high estradiol
b) Low FSH, Low LH and high estradiol
c) High FSH, High LH and ~~high~~ estradiol low
d) High FSH, High LH and High estradiol
e) 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?
a) Hypothalamic hypofunction ↓TSH 2°
b) Hypopituitarism
c) Primary hypothyroidism
d) Compensated hypothyroidism
e) 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?
a) Normal response FBS 6.1 RBS -
b) Diabetes mellitus
c) Insulinoma
d) Impaired glucose tolerance
e) Not diagnostic

30. Hypoglycernia is caused by all except:
a) Addison's disease
b) Primary heptocellular carcinoma
c) Renal failure
d) Malabsorption
e) Hyperthyroidism

31. Empylema 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 antitrypsin
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 sewm potassium of 6.9 mmol/L. Possible causes of this include the following except:
a) Insulin insufficiency
b) Conn's syndrome
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) Hyperitaminosis 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 transfemin saturation
d) Increased plasma iron
e) Increased sewn transfenin

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) Lever 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) Coproporphyrinosen oxidase
b) Hydroxymethylbilane synthetase
c) 5 amino lavulinic acid synthase
d) Ferochelatase
e) Uroporphyrinogen decarboxylase

42. What number of normal values for a parameter with Gaussian distribution will fall outside the ±2SD from the mean:
a) $1/10$
b) $1/20$
c) $1/100$
d) $1/200$
e) $1/300$

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 in concentration of 50 nmol/L
a) 7.30
b) 7.35
c) 7.40
d) 7.45
e) 7.50

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/I 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 lgm 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) Anto 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 19gdl^{-1} WBC 35 x $10^{9}/_{l}$ plat 800 x $10^{9}/_{l}$. RBC 8 x $10^{12}/_{l}$. Further relevant history include:
a) Sex
b) Body weight
c) Duration of complaint
d) Smoking
e) Diet

56. The basic investigation to accompany these automatic generation is:
a) Blood film evaluation
b) Septic screen
c) Serum levels of B_{12}, folate and iron
d) Bleeding time test
e) Phlebotomy

57. One of the following values of assessed will show an increase:
a) MCV
b) MC it
c) Red cell mass
d) Oxygen saturation
e) MCHC

58. To assess further the changes the necessary test is:
a) Reticulocyte count
b) Bone marrow aspirate
c) Trephine Bone
d) Differential WBC count
e) Splenic aspirate

59. One of the following investigation not helpful = the management of this case:
a) Philadelphia chromose
b) Jak-2
c) Leucocyte Alkaline phosphate
d) Neutrophil Alkaline phosphate
e) 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:
a) Blood film
b) Bone marrow
c) Splenic aspirate
d) White blood cell morphology and differential
e) Stool culture

61. Rectal snip is for a patient suspected to have:
    a) Kalaza
    b) Malaria
    c) Schistosomiasis
    d) Filariasis
    e) Trypanosomiasis

Transfusion[3], haemoglobin structure[2].

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^{0}C
    b) 5 days at room temperature
    c) -19^{0}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) Hepatitic 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 rbcs
    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 rbcs

66. The following is true regarding haemoglobin structure EXCEPT:
    a) The tertiary structure refers to folding of the α an 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 A_2
b) HB f
c) Hb C
d) Hb Portland
e) Hb Gower 1

68. In the coagulation cascade, the central molecule that has anole 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 B_{12} in serum is:
a) 150-600 ng/L
b) 160 – 92 sng/L
c) 3 - 6 µg / mL
d) 5 – 20 mg/L
e) 100 – 500 mcg/ml

73. The absorption of vitamin takes place at the:
a) Pnodenum with intrinsic factor
b) Stomach using pancreatic preteases
c) Terminal ileum with intrinsic factor
d) Distal ileum without intrinsic factor
e) Colon with intrinc factor, vit k and preteases

74. Serum homocysteine levels specifically increases in:
a) Vit K deficiency
b) Vitamin B_{12} deficiency
c) Folic acid deficiency
d) Iron deficiency anaemia
e) Combined Folic and Vit B_{12} deficiency

75. Rich sources of iron include the following except:
a) Meat
b) Cooked blood
c) Leafy vegetables
d) Milk
e) Poutry products

PART B - SAQ

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

b) Discuss epithelial tumours under the following:
i) Normendature
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 x 10^9/L
Platelets 496 x 10^9/L
MCV 97 ft
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)
