THE KENYA POLYTECHNIC UNIVERSITY COLLEGE

SCHOOL OF HEALTH SCIENCES AND TECHNOLOGY

DEPARTMENT OF BIOMEDICAL LABORATORY SCIENCES AND TECHNOLOGY

DIPLOMA IN MEDICAL LABORATORY SCIENCE

FINAL YEAR EXAMINATION

CLINICAL CHEMISTRY

TIME: 3 HOURS

INSTRUCTION

This paper consists of TWO SECTIONS: A and B.

Attempt **ALL** questions in SECTION A and B.

Circle the letters of ALL correct answers in each multiple choices question

Any wrong answer for multiple choices will be penalized (0.5 marks)

1. Urine amylase is likely to be elevated in patients with
    a) Acute pancreatitis
    b) Zollinger Ellison syndrome
    c) Liver cirrhosis
    d) Malabsorption syndromes
2. Reduced concentrations of CSF glucose is an indicator of
    a) Tabes dorsali
    b) Paralysis
    c) Bacterial meningitis
    d) Viral meningitis
3. Azo-bilirubin is a product formed when bilirubin reacts with
    a) Fouchet reagent
    b) Diazo reagent
    c) Schesingers test solution
    d) Diacetyl monoxime
4. Commonly encountered problems associated with serum electrophoresis include all the following except
    a) Ohms heating effect
    b) Molecular sieving
    c) Electroendosmosis
    d) Current
5. A principle of a technic used in the estimation of urea but is free from ammonia interference is
    a) Berthelot reaction
    b) Nesslerization
    c) Diacetyl monoxime
    d) Urease UV
6. On which of the following does the hormone aldosterone exact its greatest effect
    a) Glomerulus
    b) Collecting tubule
    c) Ascending loop of henli
    d) Proximal convulated tubule

7. Which group of individuals suffers functional proteinuria

a) Athletes

b) Patients with glomerulonephritis

c) Adults

d) Infants

8. The transport of a glucose molecule from the interstitial fluid to the intracellular compartment is mainly possible through

a) Active transport processes

b) Facilitated diffusion

c) Simple diffusion

d) The porous capillary bed plexus

9. Urine specimen preserved in hydrochloric acid is unsuitable for qualitative assays of

a) Uric acid
b) Hormones

c) Vitamins

d) Cholesterol

10. Elevated plasma concentrations of potassium due to cellular acidosis is accompanied by

a) Hypertension
b) A chloride shift

c) Reduced plasma sodium

d) An increase in plasma sodium

11. Factors of a pre renal phase of acute renal diseases may lead to

a) Loss of proteins in the urine
b) Congestive cardiac failure

c) Loss of electrolytes in the urine

d) Renal diabetes

12. Bence Jones proteins are abnormal proteins of pathological interest in

a) Diabetes Mellitus

b) Diabetes insipid us

c) B-cell myeloma

d) Acid –base imbalance

13. Which of the following enzymes is inhibited by fluoride?

a) Pyruvate Kinase

b) Triose Isomerase

c) Hexokinase

d) Amylase

14. The consequences of energy deficit is in the development of

a) Hypernatraemia

b) Hypokalaemia

c) Hyperglycaemia

d) Lipidaemia

15. As urine flow increases in cases of renal diabetes

a) Plasma osmolarity become increased

b) The patient suffers ascitis

c) The pancrease produces more insulin

d) Plasma aldosterone become inhibited

16. What is the net effect of the body's failure to clear glucose from the blood

a) Hypotention

b) Adipose Lipogenesis

c) Elevated endogenous triglycerides in blood

d) Elevated plasma bicarbonates

17. Examination of Beta hydroxybutyric acid in the urine requires

a) Addition of hydrogen peroxide in the urine
b) Dilution of urine specimen
c) A direct Gerhard's principle
d) A direct Roth eras testing

18. The effective mobility of proteins on an electric field is dependent on

a) Osmosis
b) Presence of buffer ions on support media
c) An increase in Ohms heating effect
d) Uncharged proteins

19. When the bile does not reach the duodenum the Lipid fractions to be found in stool will be

a) Neutral fats
b) Free fatty acids
c) Free cholesterol
d) Glycerol

20. An increased uptake of glucose by the skeletal muscular cells is enhanced by

a) Insulin
b) Cortisol
c) ANP
d) ACE

21. Although ammonia is continuously produces in the body it is rapidly removed by

a) Transamination reactions
b) Urea formation
c) Brain cells
d) Deamination processes

22. Characteristics of a photo emissive tube include all the following except

a) Dianodes

b) Inert gas

c) Selenium

d) Lacquer layer

23. Why is a pump an important part of a flame photometer

a) Enhances specimen aspiration
b) Breaks down molecules to atoms
c) Energizes the flame

d) pushes air and gas to the burner

24. 10 %transmittance of bilirubin will give an optical density of

a) 90%
b) 1.0

c) 10%

d) >1.8

25. Which of the following is not part of a photometer?

a) Slit
b) Selenium

c) A solution

d) Wave length

26. The function of insulin in the liver cells is in

a) Jnhibiting the enzyme glucokinase

b) Inhibiting the enzyme glucose phosphatase

c) Permeating the entry of glucose into the liver cells

d) Enhancing the process of gluconeogenesis

27. A test used to evaluate renal tubular function is

a) Urine specific gravity

b) GFR

c) Serum Urea

d) Plasma electrolytes

28. One of the following does not affect the linearity of the beer -lamberts law

a) Thickness of a curvet
b) pH of solution

c) The number of electrons liberated by selenium

d) Concentration of analyte

29. Blood slides meant for making blood films for the study of blood cells must be

a) Sterilized by an oven
b) Sterilized and stored in absolute alcohol

c) New and grease free

d) Have aberrations

30. The organized substances likely to be found in a urine specimen include

a) Amino acids

b) Proteins

c) Hyaline casts

d) Glucose

31. Excessive hydrolysis of free fatty acid from the adipose tissue causes

a) Diminished plasma bicarbonate

b) Low potassium concentration

c) Undermines sodium metabolism

d) Increases plasma bicarbonate

32. What is needed to increase the net filtration pressure of the glomerulus, when the blood volume is low

a) Rennin

b) Angiotensin II

c) Aldosterone

d) Bradykinin

33. Which of the following is a major cause of ulcerative colitis

a) Giardiasis

b) Autoimmunity

c) Low albumen

d) H pylori

34. A method commonly used in the detection of reducing substances in the urine of a patient in the medic al laboratory is

a) Clinistix

b) Ehliches

c) Clinitest

d) Harris boiling test

35, In order to maintain the quality of laboratory results produced in the laboratory for medical utility

a) physiological variations must be documented

b) Tests must be done in the presence of the patient

c) All tested specimen must be verified by another laboratory before

results are released

d) Instrument calibrators must be used as control material

36. Which one of the following control materials is suitable for controlling and verifying results produced in clinical chemistry?

a) Water based lyophilized controls

b) Previously analysed patients sera

c) Instrument calibrators

d) New test kits

37. Patients who suffer hypothyroidism are likely to show signs of

a) Glycosuria

b) Hypoglycemia

c) Diminished creatinine in blood

d) Obesity

38. The main function of vitamin D_3 is in the reabsorption of

a) Sodium

b) Calcium

c) Zinc

d) Amino acids

39. Which of the following lipoprotein is elevated in diabetes type I?

a) HDL

b) LDL

c) VLDL

d) Chylomicrons

40. Lipostatic activities of the adipose tissue balances the amount of body fat so as to

a) Maintain energy output

b) Enhance GIT absorption of food substances

c) Increase the activities of the cori cycle

d) Increase ketosis

SECTION B

41. Discuss the following; *(5mks)*

a) Fecal fat test (5mks)

b) Degradation of haem (5mks)

c) Hemolytic jaundice (5mks)

d) Renal diabetes (5mks)

42. a) Discuss briefly a systematic approach for the processing of a creamy white stool specimen brought to the Laboratory to establish the cause of a failing liver of an infant. (16mks)

b) Suggest two tests that form a pointer for the correct diagnosis of the condition of the above patient. (4 mks)

43. Outline the principles of the following tests

a) Bradshow (5mks)

b) Clinitest (5mks)

c) Fouchets (5mks)

d) Acetest (5mks)

Practical paper

With the help of the indicated method and materials construct a Glucose calibration standard curve with points: o mg% , 50 mg%, 100 mg%, 200 mg% and 400 mg%

Graph paper

Photometer

50 mg% primary standard

GOD reagent

Test Tubes

Diluting fluid

Plasma Specimen X

Analytical method of the specimen

Dilute the specimen 1 in 40 and use only 2 mls of the diluted specimen and mix it with 1 ml of the GOD reagent to develop color. Incubate the test for 5 minutes at room temperature for 5 minutes. Measure the absorbance of the test by photometry.

i) Determine the concentration of Glucose in the specimen with the help of the calibration standard curve you have constructed

ii) Outline the principle of GOD

iii) Give the patients diagnosis

iv) Suggest another test that will confirm your diagnosis

(20 mks)