THE KENYA POLYTECHNIC UNIVERSITY COLLEGE

SCHOOL OF HEALTH SCIENCES AND TECHNOLOGY

DEPARTMENT OF BIOMEDICAL LABORATORY SCIENCES AND TECHNOLOGY

DIPLOMA IN MEDICAL LABORATORY SCIENCE

END OF YEAR I EXAMINATION

NOVEMBER SERIES 2011

CLINICAL CHEMISTRY

TIME: 3 HOURS

INSTRUCTIONS

This paper consists of TWO SECTIONS: A and B.

Answer ALL questions in SECTION A and B.

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

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

SECTION A (40 marks)

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

a) Pyruvate Kinase
b) Triose Isomerase
c) Hexokinase
d) Amylase

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

a) Low blood pressure
b) Adipose Lipogenesis
c) Elevated endogenous triglycerides in blood
d) Elevated plasma bicarbonates

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

a) Dianodes
b) Inert gas
c) Selenium
d) Galvanometer

4. An example of an enzyme classified as a Ligase is

a) Thiolase
b) creatine kinase
c) Dehydroganase
d) Transaminase

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

a) Enhances specimen aspiration
b) Breaks down molecules to atoms
c) Hardens the metallic casing
d) Holds the atomizer in place

6. 10 %transmittance of bilirubin will give an optical density of

a) 90%
b) 10%
c) >1.
d) 1.0

7. A disease that occurs as a result of inborn errors of metabolism include

a) Alkaptonuria
b) Albinism

c) Porphyrias
d) Sicke cell disease.

8. Which of the following is not part of a photometer?
   a) Slit
   b) Selenium
   c) A solution
   d) Galvanometer

9. The function of insulin in the liver cells is in
   a) Inhibiting 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

10. When bile does not reach the duodenum the lipid fraction to be found in stool will be
   a) Neutral fat
   b) Free fatty acid
   c) Free cholesterol
   d) Glycerol

11. One of the following nitrogenous bases is a purine
   a) Cytosine
   b) Adenine
   c) Thymine
   d) Guanine

12. 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

13. An increased Adipose lipolysis is enhanced by
   a) Insulin
   b) Cortisol
   c) ANP
   d) ACE

14. A vitamin whose deficiency is known to decrease fertility in human is vitamin
   a) E
   b) A
   c) C
   d) B_1

15. The main reason for not using clinistix to determine urine glucose in a diabetic clinic is that
   a) It is too sensitive
   b) It is only positive for sugars below 100mg%
   c) Has the a similar principle as that of a cheaper clinitest

d) Clinitest is able to react with much lower urine sugar concentrations

16. A Laboratory indicator for obesity include
    a) Glucosuria with ketosis
    b) NADH
    c) Glucosuria without ketosis
    d) Hyperlipidaemia

17. Which of the following lipoproteins is elevated in diabetes type I
    a) HDL
    b) LDL
    c) VLDL
    d) Chylomicrons

18. Polished food staff may lead to the deficiency of
    a) Vitamins
    b) Carbohydrates
    c) Proteins
    d) Lipids

19. How many moles of acetylcoA are produced when palmitic acid is completely oxidized in the B- oxidative pathway?
    a) 1
    b) 2
    c) 8
    d) 9

20. 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

21. Which of the following is a predisposing factor of atherosclerosis?
    a) Obesity
    b) Elevated HDL
    c) Elevated LDL
    d) Diabetes Insipidus

22. Factors that affect enzyme assay include all the following except
    a) Concentration
    b) Temperature
    c) pH
    d) Light

23. Aliphatic amino acids include all the following except

a) Glycine
b) Alanine
c) Valine
d) Tyrosine

24. Peptones are classified as
a) Derived proteins
b) Simple proteins
c) Conjugated proteins
d) Amino acids

25. How many peptide bonds are found in a di peptide
a) 1
b) 2
c) 3
d) None

26. Which of the following is a cardiac enzyme?
a) CKMB
b) Triose Isomerase
c) Aldolase
d) SGPT

27. An important use of hexosamines is in the formation of
a) Pyruvic acid
b) Cartilages
c) Blood sugar
d) Bones

28. An oral GTT curve that represents starvation has its maximum peak
a) Depressed
b) After 30 minutes
c) Beyond the renal threshold
d) After 1 hr

29. Some of the below stated are functions of lipids
a) Solvent of vitamins
b) Solvents of Glucose
c) Synthesis of urea
d) Building blocks for protein

30. The physiological role of vitamin K is to
a) Restore fertility
b) Enhance clotting of blood
c) Stabilize vision
d) Act as hydrogen accepter

31. Although ascorbic acid is undoubtedly widely required in metabolism, it is synthesized in plants and animals except
a) Man

b) Birds
c) Citrus fruits
d) Tomatoes

32. A site located on an enzyme molecule that binds to inhibitors or activators is called
a) Isosteric site
b) Allosteric site
c) Ubiquinone
d) Michaelis- Menten constant

33. Which one of the following substances gives rise to uric acid after its metabolism?
a) Cytosine
b) Guanine
c) Serine
d) Hydroxyphenyl acetic acid

34. In which form is the pentose sugar found in the physiological fluid
a) Pyranose
b) Osazones
c) Furanose
d) Purines

35. Which one of the following is a reducing substance?
a) Sucrose
b) Homogentisic acid
c) Vitamin A alcohol
d) Peptides

36. The below indicated are principles of chromatography except
a) Adsorption
b) Partition
c) Elution
d) Electrophoresis

37. Separated substances after a paper chromatography run are identified by
a) Rf
b) Densitometry
c) Refractive index
d) Polarized light

38. Glucose is specifically identified by
a) Seliwanof's test
b) Bial's technic
c) GOD
d) Clinitest

39. A surfactant test carried out to assess lung maturity in the Antenatal laboratory is based in quantifying
a) Lecithin

b) Neutral fats
c) Cholesterol
d) Polypeptides.

40. Patients who suffer hypothyroidism are likely to show signs of
a) Glycosuria
b) Hypoglycaemia
c) Diminished creatinine in blood
d) Obesity

SECTION B (60 MARKS)

41. Briefly discuss the following:-
a) Barrier cell used in photometry (8 marks)
b) Use of plastics in the laboratory (8marks)
c) Cori cycle (4marks)

42. a) State briefly the functions of lipoproteins (8marks)
b) Discuss obesity (8marks)
c) Indicate the necessity of the urea cycle in physiology (4marks)

43. (a) Outline the principles of the following techniques
i) Bial's test (5marks)
ii) Alkaline methylamine Hydrochloride (5marks)
iii) Fermentation test (5marks)
(b) Describe briefly the structural levels of proteins (5marks)