KISII UNIVERSITY SPECIAL/SUPPLEMENTARY EXAMINATIONS

SECOND YEAR EXAMINATIONS FOR THE AWARD OF

THE DEGREE OF BACHELOR OF SCIENCE IN CLINICAL MEDICINE

COUURSE CODE: BIO 111

COURSE NAME: STRUCTURAL BIOCHEMISTRY

STREAM: TIME: ---------

DAY: ---------- -DAY: ----------

INSTRUCTIONS

1. DO NOT WRITE ANYTHING ON THIS QUESTION PAPER
2. THIS PAPER COMPRISES OF TWO PARTS AND EACH HAS TWO SECTIONS
   PART I: SECTION A: 6 SHORT ANSWER QUESTIONS, COMPULSORY
   SECTION B: 3 LONG ESSAY QUESTIONS, ANSWER ANY TWO
   PART II: 60 MULTIPLE CHOICE QUESTIONS. CHOOSE ONE CORRECT RESPONSE

PART I

SECTION A(30 MARKS)

SHORT ANSWER QUESTIONS (ANSWER ALL QUESTIONS)

1. Discuss events that lead to oxidative phosphorylation in cells..
2. Why do metabolic reactions proceed in steps.
3. Briefly discuss the importance of transamination in protein metabolism
4. Briefly explain the importance of the urea cycle
5. Explain ketogenesis , and the events which lead to this in cells
6. Describe the citric acid cycle, stating the products of this cycle

SECTION B. ANSWER ANY TWO QUESTIONS(40 MRKS)

1. Describe the events that occur in the fed and starved state in the human body during metabolism.
2. Describe the interplay of various hormones in metabolism
3. Discuss how the body resorts to ketogenesis, clearly explaining the products of this process

PART I (60 MULTIPLE CHOICE QUESTIONS)(60 MARKS)
CHOOSE ONE CORRECT RESPONSE

1. Which of the following is NOT an enzyme involved in carbohydrate metabolism
   A. peptidase
   B. hexokinase
   C. glucokinase
   D. amylase
2. Which of the following is an isomer of glucose
   A. galactose
   B.fructose
   C. maltose
   D. lactose

3. Which of the following is NOT a physical property of a monosaccharide

   A. optical

   B .isomerism

   C.solubility

   D.Denaturation

4. The possession of a carbon with 4 side chains confers on a carbohydrate which of the following
   A. chiralism
   B. optical activiy
   C. isomerism
   D. none of the above
5. Which of the following is NOT a function of a polysaccharide
   A. Source of Energy
   B. Constituent of a plasma membrane
   C. Cell to cell communication
   D. None of the above

6. Gycogen storage diseases come about as a result of

   A. enzyme defect

B. mutation
C. abnormal shape
D. All of the above

7. Which of the following tests is a functional group of a monosacharride

A.ketone
B. methyl
C. acetyl
D. nitro

.8.Which of the following tests is used to determine the presence of maltose

A. Biuret test
B. Glucose
C. Uric Acid
D. Globulin

9. Which of the following is NOT a 6 carbon sugar

A. aldotetrose

B.Ribulose

C.Xylulose

D. glucose

10. Which of the following is a 3 carbon sugar

A. glyceraldyde

B. mannose

C.fructose

D. glucose

11. Which of the following is NOT a product in the glycolytic pathway

A. carbon dioxide

B. water

C. ATP

D. citrate

12. Which of the following is a storage form of a homopolysaccharide in plants

A.glycogen

B. starch

C. collagen

D. mannose

13. The presence of an asymmetric carbon confers what of the following

A. solubility

B. optical activity

C. crystallization

D. All of the above

14 .Which of the following is an isomer of glucose

A. mannose

B. galactose

C. glucose

D. All of the above

15. Which of the following bonds hold together disaccharides

A. glycosidic

B. vander waals

C. hydrogen

D. covalent

16.Which of the following enzymes is involved in glycogenolysis

A.phosphorylase

B. synthase

C.lyase

D. None of the above

17 .Which of the following enzymes is involved in glycogenesis

A. Glycogen synthase

B. Glycogen phosphorylase

C. Glycogen Glucosidase

D. All of the above

18. Which of the following is a disease associated with glycogen metabolism

A. Type O

B. Ketonuria

C. Gout

D. Kwarshiorkor

19. Glycogen is the most abundant polysaccharide in

A. animal cells

B. plant cells

C. prokaryotes

D. All of the above

20. Which condition is likely to occur in the defect in the lysosomal enzyme glucosidae

A.Pompes

B. Von Gierkes

C. Type Ia

D . All of the above

21. Cellulose is an abundant structurall polysaccharide in

A. plants

B. animals

C. zooplanktons

D. Any of the above

22. Dextrins are highly branched homopolymers units , with not of the following linkages

A.1,4

B. 1,6

C. 1,3

D. NONE of the above

23. Polysaccharides containing more than one type of sugars are which of the following

A .Glycosaminoglcans

B. Haemoglobin

C. DNA

D. All of the above

24. Which of the following is not a glycosaminoglycan(GAG)

A. Hayluronic acid

B. Heparin

C. Chondatin sulphate

D. mitochondrion

25. Which of the following is a function of Glycosammoglycans

A.bind large amounts of water, therby producing gel like matrix

B. tightl bind cations like calcium

C. support and stabilize cellular and fibrous components

D. All of the above

26. Which of the following is a lipid?

A. Fats

B .Oils

C. Waxes

D. All of the above

27. Which of the following is not a function of a lipid

A. Energy

B. Thermal insulators

C. Structural Component

D. None of the above

28. Digestion of lipid foods start in which of the followin

A. Duodenum

B. Pancrease

C. Mouth

D. All of the above

29. Which of the following best describes the term Fatty Acid?

A. Building block of protein

B. Amino acid

C. Building block of lipids

D. reducing sugar

30. What is a beta carbon in a Fatty Acid

A. First carbon

B. Second carbon

C .Third carbon

D. Fourth carbon

31. What differentiates saturation and unsaturation in fatty acids

A. presence of a double bond

B. absence of a double bond

C. temperature

D. None of the above

32. Triacylglycerols are NOT which of the following

A. Fatty acids with glycerol

B. Esterified glycerols

C. Building blocks of lipids

D. None of the above

33. Gangliosides contain which of the following

A. N-Acetyl neuraminic acid

B. lipoprteins

C.palmitate

D. inositol

34. What is the fate of the glycerol component of triacylglycerols

A. Glycolysis

B. Citric acid cycle

C. Beta oxidation

D. None of the above

35. Cerebrosides have the following

A. Phosphate

B. Sugar groups

C. No phosphate

D. Phospholipid

36. Which of the following substances emulsify lipids

A. lipase

B. Bile salts

C. Cholestykinin

D. Hydrochloric acid

37. Which one of the following genetic disorders is not as a result of abnormal accumulation of certain complex lipids

A. Tay sachs disease

B. Fabrys disease

C. Nieman picks disease

D. Von Gierkes disease

38. Which of the following proteins assist in transporting lipids to te liver

A. Globulin

B. Albumin

C. Elastin

D. None of the above

39. Which of the following is involved in transporting long chain fatty acids to the mitochondria

A. Acyly CoA transferase

B. Carnitine transferases

C.ATP

D. ALL of the above

40. Enzymes act as what in biological systems

A. Catalysts

B. Substrates

C. Products

D. Intermediates

41. Which of the following affects enzyme activity

A. Concentration

B. Inhibitors

C. Temperature

D. All of the above

42. Which of the following enzymes are involved in the beta oxidation of fats

A. Acyl-carboxylase

B. Amylase

C. Glycogen phosphorylase

D. Pepsinogen

43.Which of the following organs does the activity of the enzyme Glucokinase occur

A. Kidney

B. Skeletal muscles

C. Liver

D. Brain

44. Which of the following hormones initiate lipolysis

A. Nor epinephrine

B. Glucagon

C. Insulin

D. None of the above

45. Clinical Enzymology is which branch of science

A. Application of enzyme analysis in diagnosis and treatment

B. Application o radiation in treatment

C. Chemotheraphy

D. Cancer studies

46. What is the basic principle in the use of enzymes in diagnosis

A. Based in comparing changes in activity in serum and plasma

B.. Presence of intracellular enzymes in blood indicates tissue damage

C. Constant level of enzymes in blood indicates normal function

D. All of the above

47. Which of the following is a ketone body

A .Acetone

B. Hydroxy butyrate

C. Acetoacetate

D. ALL of the above

48. In severe diabetes mellitus, the reason why the odor of patients is characteristic is due

A. Acetone

B. Body resorts to triacylglycerol metabolism

C. Lack of insulin

D. All of the above

49. Which of the following factors dictate to the choice of an enzyme Test

A. Enzyme distribution among tissues

B. Inactivation in blood stream

C. Tertiary structure

D. Active site

50. Which of the following enables enzymes to speed up biochemical reactions

A. Lowers activation energy
B. Increases concentration
C. Increases entropy
D. All of te above

51. Pancreatic functions are determined by which of the following enzymes

A. Amylase

B. Lipase

C. CCK

D. None of the above

52. Lipase activity in the serum is a measure exclusively for which diseases

A. Pancrease

B. Kidney

C. Liver

D. Intestines

53. 5” nucleotidase activity is generally elevated in which type of diseases

A. hepatobiliary

B. Salivary

C. Stomach

D. CancerS

54. Jaundice can be divided into which of the following

A. Haemolytic

B. Hepatocellular

C. Obstructive

D. All of the above

55. Which of the following enzymes are increased in cholesstasis

A. Alkaline phosphatase

B. Gamma Glutamyl transferase

C. 5” Nucleotidase

D .All of the above

56. Which of the following enzyme is increased in liver damage

A. SGOT

B.LDH

C. IsoCDH

D. All of the above

57. Which of the following enzymes is a cancer marker?

A. ALP

B.CK

C.CGT

D.LDH

58. The glucose oxidase test is indicated by which of the following

A. Oxidation of glucose to hydrogen peroxidase and D-glucono-$-lactone

B. Enzyme extracted by the growth medium of ASpergills nigare

D. All of the above

C. Normal ranges between 3.0 to 10 .00 Umoles/litre

59. Whiat are the clinical significance of transaminase enzymes

A. Used to detect myocardialinfarction
B. Used in cardiac ischemia
C. Used to assess liver function
D. NONE of the above

60. The urea cycle is important in the elimination of which of the following

A. Carbon dioxide

B. Water

C .Ammonia

D. ALL OF THE ABOVE