



KISII UNIVERSITY
UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF
BACHELOR OF CLINICAL MEDICINE AND SURGERY
THIRD SEMESTER 2022/2023
[MAY-AUGUST, 2023]

BIOC 211: MEDICAL BIOCHEMISTRY

STREAM: Y2S3

TIME: 2 HOURS

DAY: MONDAY, 12:00 – 2:00 PM

DATE: 31/07/2023

INSTRUCTIONS

1. Do not write anything on this question paper.

1. PART I: SECTION A: 6 SHORT ANSWER QUESTIONS

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 the fate of nucleic acids in catabolism.
2. Briefly describe what semi conservative replication of DNA is?
3. Describe the condition referred to as Xeroderma pigmentosum.
4. Briefly describe the process of transcription.
5. Explain some of the post transcriptional processes in RNAs.
6. With the help of a well labeled diagram describe ribosomal RNA.

SECTION B. ANSWER ANY TWO QUESTIONS. (40 MRKS)

1. Describe the events that occur during the synthesis of a specific protein and how this process is regulated
2. What is collagen and briefly discuss the different events that lead to its synthesis in the cells.
3. Discuss some of the specific GAGS of physiological significance.

PART I (60 MULTIPLE CHOICE QUESTIONS)(60 MARKS)

CHOOSE ONE CORRECT RESPONSE

1. Which of the following is NOT a product of degradation of pyrimidine bases
 - A. uracil
 - B. ammonia
 - C. carbon dioxide
 - D. beta-alanine
2. Which of the following is NOT a degradation product of Thymine
 - A. carbon dioxide
 - B. water
 - C. methyl-alanine
 - D. lactose
3. DNA synthesis is which of the following
 - A. replication
 - B. transcription
 - C. translation
 - D. denaturation
4. Replication starts at which of the following
 - A. Origin
 - B. T-A-T sequence
 - C. At one site
 - D. ALL of the above
5. Which of the following enzymes are involved in replication
 - A. Gyrase
 - B. Helicase
 - C. Single binding protein
 - D. ALL of the above
6. A short complementary RNA to the single strand parental DNA is called
 - A. prime
 - B. primer
 - C. nascent
 - D. None of the above
7. Which of the following is an autosomal recessive condition caused by failure of DNA repair
 - A. Xeroderma pigmentosum
 - B. sickle cell
 - C. Maple syrup
 - D. dystrophin
8. The step by step addition of ribonucleotides is NOT referred to as
 - A. Termination

- B. Elongation
- C. Post transcriptional
- D. None of the above

9. Which of the following are NOT post-transcriptional processes

- A. methylation
- B. acetylation
- C. base modification
- D. All of the above

10. Which of the following is NOT a step in translation

- A. Activation
- B. Initiation
- C. Termination
- D. None of the above

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 peptide
- A. glycosidic
 - B. phosphodiester
 - C. hydrogen
 - D. None of the above
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 glucosidase
- A. Pompe
 - B. Von Gierkes
 - C. Type Ia
 - D. All of the above
21. Which of the following are inhibitors of protein synthesis
- A. streptomycin

B. Tetracycline

C. puromycin

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 connective tissues

A.supports tissues and organs

B. separates different tissues

C. connects organs

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 connective tissue

A. Epithelial

B. muscular

C. Nervous

D. None of the above

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

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. All connective tissues has which of the following

A. cells

B. fibers

C. extracellular matrices

D. ALL of the above

32. Which of the following is a function of connective tissues

A. store energy

B. provides structural framework

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 the 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. Collagen has an unusual amino acid composition and sequence
- A. Glycine
 - B. Proine
 - C. Hydroxyproline
 - D. ALL of the above

41. Which of the following conditions leads to scurvy
- A. Vitamin C deficiency
 - B. Vitamin K deficiency
 - C. Vitamin D deficiency
 - 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. Osteogenesis imperfect is caused by
- A. a mutation in type 1 collagen
 - B. genetics
 - C. Chemotherapy
 - D. a mutation in type 4 collagen
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. Collagen is used in which of the following
- A. FOOD
 - B. Cosmetic surgery
 - C. Casing for sausages
 - 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. Elastin is a protein in the connective which does which of the following
- A. Allows many tissues to resume shape
 - B. Load bearing tissue
 - C. Used for mechanical energy
 - D. All of the 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 cholestasis
- 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. What 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. Hyaluronic acid
- A. A connective tissue
 - B. Polymers that displace a large volume of Water
 - C. Forms non-covalently linked complexes with proteaglycans
 - D. ALL OF THE ABOVE