



FOR KUET EXAM PREPARATION

KUET 2023

Question Paper · M.Sc. Clinical Biochemistry

EXAM
KUET

YEAR
2023

TYPE
Question Paper

SUBJECT
M.Sc. Clinical Biochemistry

Sr. No.

ENTRANCE TEST-2023**SCHOOL OF BIOLOGICAL SCIENCES****CLINICAL BIOCHEMISTRY**

Question Booklet Series

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Total Questions : 60

Time Allowed : 70 Minutes

Roll No. :

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Instructions for Candidates :

1. Write your Entrance Test Roll Number in the space provided at the top of this page of Question Booklet and fill up the necessary information in the spaces provided on the OMR Answer Sheet.
2. OMR Answer Sheet has an Original Copy and a Candidate's Copy glued beneath it at the top. While making entries in the Original Copy, candidate should ensure that the two copies are aligned properly so that the entries made in the Original Copy against each item are exactly copied in the Candidate's Copy.
3. All entries in the OMR Answer Sheet, including answers to questions, are to be recorded in the Original Copy only.
4. Choose the correct / most appropriate response for each question among the options A, B, C and D and darken the circle of the appropriate response completely. The incomplete darkened circle is not correctly read by the OMR Scanner and no complaint to this effect shall be entertained.
5. Use only blue/black ball point pen to darken the circle of correct/most appropriate response. In no case gel/ink pen or pencil should be used.
6. Do not darken more than one circle of options for any question. A question with more than one darkened response shall be considered wrong.
7. There will be '**Negative Marking**' for wrong answers. Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.
8. Only those candidates who would obtain positive score in Entrance Test Examination shall be eligible for admission.
9. Do not make any stray mark on the OMR sheet.
10. Calculators and mobiles shall not be permitted inside the examination hall.
11. Rough work, if any, should be done on the blank sheets provided with the question booklet.
12. OMR Answer Sheet must be handled carefully and it should not be folded or mutilated in which case it will not be evaluated.
13. Ensure that your OMR Answer Sheet has been signed by the Invigilator and the candidate himself/herself.
14. At the end of the examination, hand over the OMR Answer Sheet to the invigilator who will first tear off the original OMR sheet in presence of the Candidate and hand over the Candidate's Copy to the candidate.

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[Turn over

1. The SF_4 molecule has which type of geometry ?
 (A) Tetrahedral
 (B) Bent
 (C) See Saw
 (D) T-Shaped
2. The Bond Order of N_2 is
 (A) 2
 (B) 1
 (C) 3
 (D) 2.5
3. What is the pH of a $1.0 \times 10^{-8}\text{M}$ Solution of HCL?
 (A) 5.98
 (B) 6.98
 (C) 6.40
 (D) 5.50
4. For a spontaneous change, total entropy is
 (A) Negative
 (B) Positive
 (C) Zero
 (D) Either positive or negative
5. Which among the following is an example of transport Protein?
 (A) Myosin
 (B) Hemoglobin
 (C) Collagen
 (D) None of these
6. Which among the following shows inversion of configuration when subjected to hydrolysis?
 (A) Glucose
 (B) Galactose
 (C) Sucrose
 (D) Maltose
7. Which one of the following fatty acids is synthesized by the cells in the body from Linoleic acid ?
 (A) Linolenic acid
 (B) Lysgeric acid
 (C) Arachidonic acid
 (D) None of the above
8. Which amino acid is the precursor of Creatinine, heme, bile acids in the body ?
 (A) Tryptophan
 (B) Glycine
 (C) Cysteine
 (D) Alanine
9. Which of the following enzyme classes catalyses the linking of two compounds?
 (A) Transferases
 (B) Hydrolases
 (C) Ligases
 (D) Lyases
10. Which of the following has no effect on simple enzyme activity?
 (A) Substrate concentration
 (B) pH
 (C) Temperature
 (D) Presence of Co-enzymes
11. Which of the following statements is true for enzymatically catalysed reaction?
 (A) Additional substrate molecules are energized to overcome the activation energy of the reaction
 (B) The activation energy of the reaction is lowered so that a larger proportion of the substrate qualifies to overcome it
 (C) The activation energy of the reaction is increased, thus decreasing the likelihood that any substrate molecules will overcome it
 (D) The activation energy of the reaction is lowered so that fewer substrate molecules can overcome it

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12. Non-competitive inhibitor of an enzyme catalysed reaction
- Decreases V_{max}
 - Binds to Michaelis complex (ES)
 - Both (A) and (B)
 - Can actually increase reaction velocity in rare cases
13. Von Geirke's disease occurs due to deficiency of which enzyme ?
- Glucose -6-phosphatase
 - Phosphofructokinase
 - Phosphorylase
 - Phosphoglucomutase
14. Transamination of aspartate forms
- Pyruvate
 - Oxaloacetate
 - Acetyl CoA
 - Alanine
15. Which organ of the body is mainly affected in Phenylketonuria?
- Liver
 - Kidney
 - Brain
 - Heart
16. The BMR of an average man is around:
- 5900 KJ
 - 7100 KJ
 - 6100 KJ
 - 5500 KJ
17. Which ribosome is present in the Prokaryotic cell?
- 80S
 - 70S
 - 50S and 40S
 - 60S and 30S
18. Peroxisome has a prominent role in the metabolism of
- Citric acid cycle
 - C_3 Pathway
 - Glyoxylate pathway
 - Glycolysis
19. Mitochondrial DNA is different from nuclear DNA because of
- Being linear
 - Having A=T and C=G
 - Lacking histone bodies
 - None of these
20. In cell membrane, carbohydrates in glycoproteins or glycolipids are oriented:
- Towards outside
 - Towards inside
 - Towards outside and inside
 - Randomly distributed
21. What is the basis for the difference in how the leading and lagging strands of DNA molecules are synthesized?
- The origins of replication occur only at the 5' end.
 - Helicases and single-strand binding proteins work at the 5' end.
 - DNA polymerase can join new nucleotides only to the 3' end of a growing strand.
 - DNA ligase works only in the 3' to 5' direction.

22. *E. coli* cells grown on ^{15}N medium are transferred to ^{14}N medium and allowed to grow for two more generations (two rounds of DNA replication). DNA extracted from these cells is centrifuged. What density distribution of DNA would you expect in this experiment?
- one high-density and one low-density band
 - one intermediate-density band
 - one high-density and one intermediate-density band
 - one low-density and one intermediate-density band
23. The functioning of enhancers is an example of
- transcriptional control of gene expression.
 - a post-transcriptional mechanism to regulate mRNA.
 - the stimulation of translation by initiation factors.
 - post-translational control that activates certain proteins.
24. In eukaryotic cells, transcription cannot begin until
- the two DNA strands have completely separated and exposed the promoter.
 - several transcription factors have bound to the promoter.
 - the 5' caps are removed from the mRNA.
 - the DNA introns are removed from the template.
25. Photoautotrophs use
- light as an energy source and CO_2 as a carbon source.
 - light as an energy source and methane as a carbon source.
 - N_2 as an energy source and CO_2 as a carbon source.
 - CO_2 as both an energy source and a carbon source.
26. Which of the following statements is *not* true?
- Archaea and bacteria have different membrane lipids.
 - Both archaea and bacteria generally lack membrane enclosed organelles.
 - The cell walls of archaea lack peptidoglycan.
 - Only bacteria have histones associated with DNA.
27. Biologists suspect that endosymbiosis gave rise to mitochondria before plastids partly because
- The products of photosynthesis could not be metabolized without mitochondrial enzymes.
 - All eukaryotes have mitochondria (or their remnants), whereas many eukaryotes do not have plastids.
 - Mitochondrial DNA is less similar to prokaryotic DNA than is plastid DNA.
 - Without mitochondrial CO_2 production, photosynthesis could not occur.
28. Which of the following involves metabolic cooperation among prokaryotic cells?
- Binary fission
 - Endospore formation
 - Endotoxin release
 - Biofilms
29. Fowl cholera in chickens is caused by
- Bacillus anthrax*
 - Clostridium tetani*
 - E. coli*
 - Pasteurella multocida*

30. The most important attractant released by the invading bacteria and not produced by mammalian cells is
- Interleukin-8
 - Formylated methionine
 - C5a
 - All of the above
31. The amino acid which is responsible for producing more flexibility at the hinge region of an antibody is
- Glycine
 - Tyrosine
 - Tryptophan
 - Proline
32. The proteins that participate in formation of alternative pathway of complementary system are
- C1, C4, C2, C3
 - C2, C5, C7, C3
 - C3, factor B, factor D, Properdin
 - None of the above
33. Independent assortment occurs when homologous chromosomes are
- Uniformly segregated into different gametes
 - Randomly segregated into different gametes
 - Uniformly segregated into same gametes
 - Randomly segregated into same gametes
34. Which one is not an example of Mendelian trait/disorder in humans?
- Phenylketonuria
 - Thalassemia
 - Cystic fibrosis
 - Turner's syndrome
35. Segregation occurs when the homologous chromosomes separate during
- Meiotic prophase-I
 - Meiotic metaphase-I
 - Meiotic anaphase-I
 - Meiotic telophase-I
36. Which statement is not true for crossing over ?
- It increases variability by forming new gene combinations
 - It involves non-sister chromatids of homologous chromosomes
 - It reduces variability by forming new gene combinations
 - It leads to separation of linked genes
37. Which of the following gene is not essential for creating golden rice ?
- Phytoene synthase
 - Zeta carotene desaturase
 - Lycopene-beta-cyclase
 - Phytoene desaturase
38. The non-autonomous controlling element reported in maize by Barbara Mc Clintock was
- Ac element
 - Ds element
 - L1 element
 - All of the above
39. Which of the following Vir genes form a transfer apparatus for T-DNA export from bacteria into the plant cell ?
- Vir B complex and Vir D4
 - Vir G and Vir A
 - Vir D4 and Vir D2
 - Vir C1 and Vir A

40. RNase H
- Cleaves and digests RNA
 - Cleaves and digests the RNA-DNA heteroduplex
 - Cleaves single stranded DNA and RNA
 - Removes nucleotides from 5' end of DNA and RNA
41. Caraway method is used for the estimation of
- Blood Urea
 - Serum Creatinine
 - Serum Urea
 - Serum Uric acid
42. Deficiency of enzyme glucose-6-phosphate dehydrogenase results in
- Thalassemia
 - Sickle cell anemia
 - Hemolytic anemia
 - Megaloblastic anemia
43. The over production of Bilirubin beyond the ability of liver to conjugate is known as
- Hepatic Jaundice
 - Post Hepatic Jaundice
 - Hemolytic Jaundice
 - All of the above
44. Bence Jones protein are found in 40% cases of
- Arthritis
 - Gout
 - Multiple myeloma
 - Injury
45. Which of the following compounds are produced by Normal endothelium that inhibits platelet aggregation ?
- Prostacyclin and nitric-oxide
 - Collagen and thromboxane
 - Thromboxane and ADP
 - Platelet phospholipid
46. Blood is
- Ectodermal in origin
 - Mesodermal in origin
 - Endodermal in origin
 - None of the above
47. Pernicious anaemia develops because of
- Folic acid deficiency
 - Iron deficiency
 - Inability to absorb vitamin B12
 - All of the above
48. Which of the following are features of chronic inflammation ?
- Occurs for few months to several years
 - Instant response
 - Involves mast cells, macrophages and other granulocytes
 - Release of chemical compounds like histamine, prostaglandins, leukotrienes
 - Involves cytokines and antibodies
 - T and B cells are involved
- 1, 3, 6
 - 2, 3, 4, 6
 - 1, 3, 4, 5
 - 1, 5, 6
49. Which of the following respiratory systems does not have a close relationship with a blood supply?
- The tracheal system of an insect
 - The lungs of a vertebrate
 - The gills of a fish
 - The skin of an earthworm
50. Growth factors are local regulators that
- Are produced by the anterior pituitary.
 - Bind to cell-surface receptors and stimulate growth and development of target cells.
 - Are modified fatty acids that stimulate bone and cartilage growth.
 - Are found on the surface of cancer cells and stimulate abnormal cell division.

51. Steroid and peptide hormones typically have in common
- Their requirement for travel through the bloodstream.
 - The building blocks from which they are synthesized.
 - Their solubility in cell membranes.
 - The location of their receptors.
52. The trachea and oesophagus of mammals are both connected to the
- Large intestine.
 - Pharynx.
 - Stomach.
 - Rectum.
53. To facilitate chromatographic separation, the composition of mobile phase may be gradually changed with respect to
- pH
 - Salt concentration
 - Polarity
 - All of the above
54. In absorption chromatography, adsorption equilibrium is between
- Stationary solid ion exchanger and mobile liquid electrolyte phase
 - Stationary liquid phase and a mobile liquid or gas phase
 - Stationary solid phase and a mobile liquid phase
 - Stationary immobilized ligand and a mobile liquid phase
55. A 7.5% polyacrylamide gel is used to separate proteins ranging between
- 60-20kd
 - 30-120kd
 - 15-45kd
 - 12-30kd
56. In centrifugation, angular velocity(ω) is calculated by the equation
- $$A. \omega = \frac{4\pi^2 (\text{rev.min}^{-1})^2 r}{3600 \times 981}$$
- $$B. \omega = \frac{2\pi \text{ rev.min}^{-1}}{60}$$
- $$C. \omega = \frac{4\pi^2 (\text{rev.min}^{-1})^2 r}{60 \times 981}$$
- $$D. \omega = \frac{2\pi \text{ rev.min}^{-1}}{3600}$$
57. Alpha-linolenic acid is the precursor of the plant hormone
- Cytokinin
 - Jasmonic acid
 - Strigolactones
 - Ethylene option
58. The prosthetic group/groups present in subunits of enzyme nitrate reductase
- NAD, FAD, Ca
 - FAD, Mn, Mo
 - FAD, heme, pterin
 - cyt-b557, NAD, FAD
59. High carbon dioxide compensation point is found in
- C4 plants
 - C3 plants
 - CAM plants
 - None of the above
60. Which one of the following plant hormones use two component histidine kinase receptor system for signal transduction ?
- Auxin
 - Cytokinin
 - Gibberellin
 - Absciscic acid

ROUGH WORK

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