

**MUSLIM STUDENT SOCIETY OF NIGERIA**  
**CIRCLE OF PRELIM MUSLIM SCIENCE STUDENTS**  
**PRE-EXAM 2016/2017**

Answer all questions

Time: -50mins

Matric No

1. The site for protein synthesis are; a. ribosome b. lysosomes c. cristae d. nucleus e. plasma membrane
2. The conversion of sugar to pyruvic acid is called a. oxidation b. cellular metabolism c. glycolysis d. phosphorylation e. electron transport
3. Movement of ions against their concentration gradient is a. diffusion b. osmosis c. glycolysis d. active transport e. passive transport
4. Proteins that do not penetrate into the membrane bilayer are a. globulae b. integral c. extrinsic d. amphiphilic e. intrinsic
5. DNA replication occurs during \_\_\_\_\_ phase a. G1 b. G2 c. M d. S e. G
6. DNA interacts with a class of proteins called \_\_\_\_\_ a. histamine b. glycine c. histone d. phenylalanine e. collagen
7. Uracil is a good example of a a. purine b. pyrimidine c. RNA d. a and b e. none
8. The property of an amino acid is conferred on it by a. alpha carbon b. side chain 'R' c. carboxylic acid d. amino group e. phosphate group
9. Microfilaments are made from proteins called a. collagen b. actin c. tubulin d. myosin e. elastin
10. The endoderm produces organs like a. heart, kidney and gonads b. pancreas and liver c. bone, muscles and tendon d. none of the above e. all of the above
11. The numerous smaller cells produced during cleavage is called a. blastomere b. blastula c. embryo d. morula e. zygote
12. In many multicellular organisms, cell division occurs a. at mitosis b. at embryonic stage only c. only during cleavage d. throughout life e. none of the above
13. Neurulation can be described as a. a series of cellular interactions between three germ layer to form organs b. a series of cellular interactions that causes the mid-dorsal ectodermal cells to form the neural tube c. a series of cellular interactions that causes the mid-dorsal endodermal cells to form the neural tube d. a series of cellular interactions between the mesodermal and endodermal cells to form the neural tube e. none of the above
14. In albinism, the chance that two carrier parents will produce a normal offspring is a.  $\frac{3}{3}$  b.  $\frac{1}{4}$  c.  $\frac{1}{3}$  d.  $\frac{1}{2}$  e.  $\frac{3}{4}$
15. In dihybrid crosses, when homozygous recessive traits are crossed with F1 to ascertain the genotype, the process is called \_\_\_\_\_ a. test back b. checking c. back cross d. cross over e. test cross
16. Steroids belong to the group of macromolecules called \_\_\_\_\_ a. steroidal b. lipids c. proteins d. disaccharide e. steromones
17. The basic unit of polypeptide is a. amino acid b. Fatty acid c. peptides d. polypeps e. glucose
18. Which of the following statement is false a. DNA is the macromolecule of inheritance b. DNA is the molecule of inheritance c. DNA makes protein via RNA d. DNA contains nitrogen atoms e. none of the above
19. Bone and blood tissue are derivatives of the \_\_\_\_\_ a. ectoderm b. mesoderm c. endoderm d. chorda-mesoderm e. all of the above
20. The triplet AUG codes for the amino acid \_\_\_\_\_ a. glycine b. alanine c. phenylalanine d. tyrosine e. methionine
21. The three regulatory enzymes of glycolysis are \_\_\_\_\_ a. Hexokinase, phosphoglucose isomerase and phosphofructokinase b. hexokinase, phosphoglycerate kinase and phosphofructokinase c. hexokinase, phosphofructokinase and pyruvate kinase d. hexokinase, phosphoglycerate kinase and pyruvate kinase e. hexokinase, phosphofructokinase, glucokinase
22. The bond between a phosphate group and a pentose sugar is \_\_\_\_ a. ester b. phosphodiester c. glycosidic d. hydrogen e. peptide

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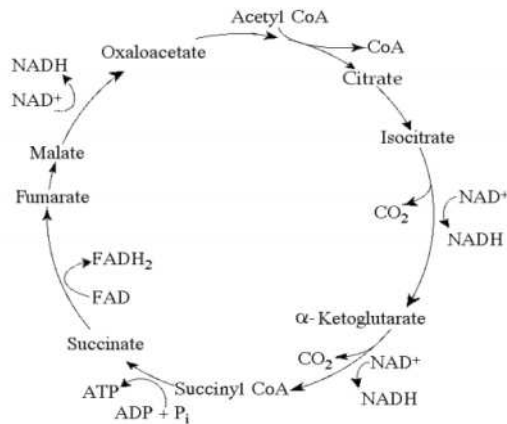
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23. Sperms are produced in the \_\_\_\_\_ a. interstitial fluid b. seminiferous tubule c. epididymis d. vas deferens e. prostate gland
24. Each ejaculate of a man contains about how many sperm a. 400 b. 4000 c. 40000 d. 400000 e. 40000000
25. The electron transport chain begins with the reaction of an organic metabolite with the coenzyme a. NADH b. Cytochrome c. FAD d. NAD<sup>+</sup> e. Acetyl CoA
26. What is the chemical mechanism by which cells make polymers from monomers? a. phosphodiester linkages b. hydrolysis c. dehydration reactions d. ionic bonding of monomers e. the formation of disulfide bridges between monomers
27. The enzyme amylase can break glycosidic linkages between glucose monomers only if the monomers are the  $\alpha$  form. Which of the following could amylase break down? a. glycogen b. cellulose c. Chitin d. A and B only e. A, B, and C
28. There are 20 different amino acids. What makes one amino acid different from another? a. different carboxyl groups attached to an alpha ( $\alpha$ ) carbon b. different amino groups attached to an alpha ( $\alpha$ ) carbon c. different side chains (R groups) attached to an alpha ( $\alpha$ ) carbon d. different alpha ( $\alpha$ ) carbons e. different asymmetric carbons
29. The tertiary structure of a protein is the a. bonding together of several polypeptide chains by weak bonds. b. order in which amino acids are joined in a polypeptide chain. c. unique three-dimensional shape of the fully folded polypeptide. d. organization of a polypeptide chain into an  $\alpha$  helix or  $\beta$  pleated sheet e. overall protein structure resulting from the aggregation of two or more polypeptide subunits.
30. Which of the following statements about the 5' end of a polynucleotide strand of DNA is correct? a. The 5' end has a hydroxyl group attached to the number 5 carbon of ribose b. The 5' end has a phosphate group attached to the number 5 carbon of ribose c. The 5' end has thymine attached to the number 5 carbon of ribose d. The 5' end has a carboxyl group attached to the number 5 carbon of ribose e. The 5' end is the fifth position on one of the nitrogenous bases.
31. What kinds of molecules pass through a cell membrane most easily? a. small and hydrophilic b. small and hydrophobic c. large polar d. ionic e. monosaccharides such as glucose
32. What are the membrane structures that function in active transport? a. peripheral proteins b. carbohydrates c. cholesterol d. cytoskeleton filaments e. integral proteins
33. Which type of organelle is primarily involved in the synthesis of oils, phospholipids, and steroids? a. ribosome b. lysosome c. smooth endoplasmic reticulum d. mitochondrion e. contractile vacuole
34. Motor proteins provide for molecular motion in cells by interacting with what types of cellular structures? a. transport vesicles b. membrane proteins c. ribosomes d. cytoskeletons e. cellulose fibers in the cell wall
35. Which statement *correctly* characterizes bound ribosomes? a. Bound ribosomes are enclosed in their own membrane b. Bound and free ribosomes are structurally different c. Bound ribosomes generally synthesize membrane proteins and secretory proteins d. The most common location for bound ribosomes is the cytoplasmic surface of the plasma membrane e. All of the above.
36. During glycolysis, when glucose is catabolized to pyruvate, most of the energy of glucose is a. transferred to ADP, forming ATP b. transferred directly to ATP c. retained in the pyruvate b. stored in the NADH produced e. used to phosphorylate fructose to form fructose-6-phosphate
37. Cellular respiration harvests the most chemical energy from which of the following? a. substrate-level phosphorylation b. oxidative phosphorylation c. converting oxygen to ATP d. transferring electrons from organic molecules to pyruvate e. generating carbon dioxide and oxygen in the electron transport chain

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Refer to the Figure above, showing the citric acid cycle, as a guide to answer the following questions.

38. Starting with one molecule of isocitrate and ending with fumarate, what is the maximum number of ATP molecules that could be made through substrate-level phosphorylation? a. 1 b. 2 c. 11 d. 12 e. 24
39. Carbon skeletons for amino acid biosynthesis are supplied by intermediates of the citric acid cycle. Which intermediate would supply the carbon skeleton for synthesis of a five-carbon amino acid? a. succinate b. malate c. citrate d.  $\alpha$ -ketoglutarate e. isocitrate
40. How many molecules of carbon dioxide ( $\text{CO}_2$ ) would be produced by five turns of the citric acid cycle? a. 2 b. 5 c. 10 d. 12 e. 60
41. How many reduced dinucleotides would be produced with four turns of the citric acid cycle? a. 1  $\text{FADH}_2$  and 4  $\text{NADH}$  b. 2  $\text{FADH}_2$  and 8  $\text{NADH}$  c. 4  $\text{FADH}_2$  and 12  $\text{NADH}$  d. 1  $\text{FAD}$  and 4  $\text{NAD}^+$  e. 4  $\text{FAD}^+$  and 12  $\text{NAD}^+$
42. Starting with citrate, which of the following combinations of products would result from three turns of the citric acid cycle? a. 1 ATP, 2  $\text{CO}_2$ , 3  $\text{NADH}$ , and 1  $\text{FADH}_2$  b. 2 ATP, 2  $\text{CO}_2$ , 1  $\text{NADH}$ , and 3  $\text{FADH}_2$  c. 3 ATP, 3  $\text{CO}_2$ , 3  $\text{NADH}$ , and 3  $\text{FADH}_2$  d. 3 ATP, 6  $\text{CO}_2$ , 9  $\text{NADH}$ , and 3  $\text{FADH}_2$  e. 38 ATP, 6  $\text{CO}_2$ , 3  $\text{NADH}$ , and 12  $\text{FADH}_2$
43. Which of the following describes ubiquinone? a. a protein in the electron transport chain b. a small hydrophobic coenzyme c. a substrate for synthesis of  $\text{FADH}_2$  d. a vitamin needed for efficient glycolysis e. an essential amino acid
44. Which metabolic pathway is common to both cellular respiration and fermentation? a. the oxidation of pyruvate to acetyl CoA b. the citric acid cycle c. oxidative phosphorylation d. glycolysis e. chemiosmosis
45. A gene's location along a chromosome is known as which of the following? a. Allele b. Sequence c. Locus d. Variant e. Trait
46. Which of the following happens at the conclusion of meiosis I? a. Homologous chromosomes are separated b. The chromosome number per cell is conserved c. Sister chromatids are separated d. Four daughter cells are formed e. The sperm cells elongate to form a head and a tail end.
47. Which of the following occurs in meiosis but not in mitosis? a. Chromosome replication b. Synapsis of chromosomes c. Production of daughter cells d. Alignment of chromosomes at the equator e. Condensation of chromatin
48. \_\_\_\_\_ Tissues are the most abundant and the most widely distributed a. epithelial b. muscle c. nervous d. connective e. abundant

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49. The vertebrate ectoderm is the origin of the a. nervous system. b. liver c. pancreas d. heart e. kidneys.
50. At the time of implantation, the human embryo is called a a. blastocyst b. gastrula c. fetus d. somite e. zygote.
51. Two characters that appear in a 9:3:3:1 ratio in the F2 generation should have which of the following properties? a. Each of the traits is controlled by single genes b. The genes controlling the characters obey the law of independent assortment c. Each of the genes controlling the characters has two alleles d. Four genes are involved e. Sixteen different phenotypes are possible
52. Mendel's observation of the segregation of alleles in gamete formation has its basis in which of the following phases of cell division a. Prophase I of meiosis b. Prophase II of meiosis c. Metaphase I of meiosis d. Anaphase I of meiosis e. Anaphase of mitosis
53. In a cross  $AaBbCc \times AaBbCc$ , what is the probability of producing the genotype  $AABBCC$ ? a.  $\frac{1}{4}$  b.  $\frac{1}{8}$  c.  $\frac{1}{16}$  d.  $\frac{1}{32}$  e.  $\frac{1}{64}$
54. In cattle, roan coat color (mixed red and white hairs) occurs in the heterozygous ( $Rr$ ) offspring of red ( $RR$ ) and white ( $rr$ ) homozygotes. Which of the following crosses would produce offspring in the ratio of 1 red : 2 roan : 1 white a. red  $\times$  white b. roan  $\times$  roan c. white  $\times$  roan d. red  $\times$  roan e. The answer cannot be determined from the information provided.
55. The question above is an example of a. co-dominance b. epistasis c. incomplete dominance d. multiple allele e. pleiotropy
56. A man has six fingers on each hand and six toes on each foot. His wife and their daughter have the normal number of digits. Extra digits is a dominant trait. What fraction of this couple's children would be expected to have extra digits? a.  $\frac{1}{4}$  b.  $\frac{1}{16}$  c.  $\frac{3}{4}$  d.  $\frac{1}{2}$  e. 0
57. RNA polymerase moves in which direction along the DNA? a.  $3' \rightarrow 5'$  along the template strand b.  $3' \rightarrow 5'$  along the coding (sense) strand c.  $5' \rightarrow 3'$  along the template strand d.  $3' \rightarrow 5'$  along the coding strand e.  $5' \rightarrow 3'$  along the double-stranded DNA
58. Choose the answer that has these events of protein synthesis in the proper sequence. 1. An aminoacyl-tRNA binds to the A site. 2. A peptide bond forms between the new amino acid and a polypeptide chain. 3. tRNA leaves the P site, and the P site remains vacant. 4. A small ribosomal subunit binds with mRNA. 5. tRNA translocates to the P site. a. 1, 3, 2, 4, 5 b. 4, 1, 2, 5, 3 d. 5, 4, 3, 2, 1 d. 4, 1, 3, 2, 5 e. 2, 4, 5, 1, 3
59. The anticodon of a particular tRNA molecule is a. complementary to the corresponding mRNA codon b. complementary to the corresponding triplet in rRNA. c. the part of tRNA that bonds to a specific amino acid d. changeable, depending on the amino acid that attaches to the tRNA e. catalytic, making the tRNA a ribozyme.
60. Bulk transport includes the following except a. phagocytosis b. pinocytosis c. exocytosis d. symport e. receptor-mediated
61. The ZOO114 cpmss tutorial is a. fair b. bad c. good d. very good e. satisfactory