

189/2015

1. Which of the following intermediates of TCA cycle cannot be utilized for gluconeogenesis ?
(A) Succinate (B) Malate
(C) α - Keto glutarate (D) Acetylc CoA
2. Which statement best explains the function of the nuclear pore complex ?
(A) It organizes DNA into at least five different levels of packing
(B) It determines which genes each cell will express
(C) It defines the regions of chromosomes that are replicated first during cell division
(D) It determines which proteins pass into and out of the nucleus
3. The function of cAMP in a cell is :
(A) To activate a G protein (B) To remove phosphate groups from ATP
(C) To activate kinases (D) To bind to the first messenger
4. The $\text{Na}^+ - \text{K}^+$ pump is :
(A) Peripheral protein (B) An integral protein
(C) A G - protein (D) A glycolipid
5. If a protein contains a primary binding site and an allosteric site, what else can you predict about this protein ?
(A) Occupancy of the allosteric site alters the binding affinity of the primary site
(B) The primary binding site has a higher concentration of hydrophobic amino acids than the allosteric site
(C) The protein has quaternary structure
(D) The primary binding site and allosteric site form a domain
6. Which of the following substance may not be useful in stabilizing enzyme solution ?
(A) Proteins (B) Bile salts (C) Nucleic acids (D) Amino acids
7. Which of the following best defines immunotoxins ?
(A) Toxic substances released by macrophages
(B) Cytokines
(C) Toxins coupled to antigen-specific immunoglobulins
(D) Toxins released by cytotoxic T cells
8. FSH secretion begins to rise and new follicles begin to grow during :
(A) The premenstrual phase (B) The menstrual phase
(C) The preovulatory phase (D) The luteal phase

9. Construction of a restriction map of DNA requires all of the following except :
- Complete hydrolysis of DNA
 - Partial hydrolysis of DNA
 - Cyclic heating and cooling of the reaction mixture
 - Electrophoretic separation of fragments on a gel
10. One theory of senescence is that it results from a lifetime of damage by :
- Teratogens
 - Aneuploidy
 - Free radicals
 - Cytomegalovirus
11. The function of endonucleases during eukaryotic transcription termination is :
- To expose the TATA sequences in the primary transcript
 - To expose the polyadenylation site on the primary transcript
 - To form a hairpin loop structure in the primary transcript
 - To cut the primary transcript RNA away from the RNA polymerase
12. All the following are constituents of ganglioside molecules except :
- Glycerol
 - Sialic acid
 - Sphingosine
 - Long chain fatty acid
13. PS-I gets de-energised electrons from :
- Water
 - Plastoquinone
 - Plastocyanin
 - Cytochrome f
14. One of them is a scientist involved in studies on vitamin D action :
- Antony Norman
 - Antony Means
 - Antony Quinn
 - Mark Antony
15. Which of the following statements explains the use of fluorochromes in immunophenotyping by clinical flow cytometry ?
- Fluorochromes bind non-specifically to leukocytes
 - All fluorochromes emit light at the same wavelength
 - Several fluorochromes can be excited by light of a single wavelength
 - The wavelength of the emitted light is the same as that of the incident light
16. What do flippases and floppases do ?
- Synthesize phospholipids on both faces of a membrane
 - Move phospholipids from one face of a membrane to the other
 - Move proteins from one face of a membrane to another
 - Change the shape of phospholipids from one stable conformation to another
17. Digestive enzymes are released by pancreas and bile is released by the liver in response to the hormone :
- Gastrin
 - Zymogen
 - Cholecystokinin
 - Insulin

18. Membrane carriers resembles enzymes except for the fact that carriers :
- Are not protein
 - Do not have binding sites
 - Do not chemically change their ligands
 - Change confirmation when they bind a ligand
19. Gibberellins stimulate :
- Cell division
 - Growth of lateral roots
 - Curvature of coleoptiles
 - Elongation of internode
20. Galactosemia is due to deficiency of :
- Galactose-1-phosphate UDP transferase
 - Galactokinase
 - Galactose-4-epimerase
 - All the above
21. Citrate is converted to isocitrate by aconitase which contains :
- Ca^{++}
 - Fe^{++}
 - Zn^{++}
 - Mg^{++}
22. When the fluid outside a cell has a greater concentration of a given molecule than the fluid inside the cell, the external fluid is :
- Isotonic
 - Hypertonic
 - Hypotonic
 - Ultratonic
23. eRF1 is release factor in eukaryotes that require :
- ATP for its binding to ribosome
 - GTP for its binding to ribosome
 - ATP and GTP for its binding to ribosome
 - Mn^{2+} for its binding to ribosome
24. A molecule of CO_2 is captured by biotin when it acts as coenzyme for carboxylation reaction. The carboxyl group is covalently attached to :
- A nitrogen (N_1) of the biotin molecule
 - Sulphur of thiophene ring
 - α -Amino group of lysine
 - α -Amino group of protein
25. Which of the following cytokines plays a role in terminating inflammatory responses ?
- IL-2
 - IL-1 β
 - TGF- β
 - IFN- α

26. During the formation of urine in the kidney, most of the water is reabsorbed into the blood in the :
- (A) Ascending loop of henle (B) Descending loop of henle
(C) Distal convoluted tubule (D) Proximal convoluted tubule
27. The following points about microfilaments are true except :
- (A) They form cytoskeleton with microtubules
(B) They provide support and shape
(C) They form intracellular conducting channels
(D) They are involved in muscle cell contraction
28. Production of more than one phenotypic trait by a single gene is called :
- (A) Pleiotrophy (B) Genetic determinism
(C) Codominance (D) Genetic recombination
29. Hydrolases are involved in hydrolysis of :
- (A) Esters (B) Glycosidic bonds
(C) Peptide bond (D) All the above
30. What are cadherins ?
- (A) Proteins that permit adjacent cells to form adherens junctions
(B) Proteins that link the basal membrane of epithelial cells to laminins
(C) Proteins that bind integrins to intermediate filaments in skin cells
(D) Proteins that allow white blood cells to come to a rolling stop in blood vessels
31. The glial cells that destroy micro-organism in the CNS are :
- (A) Microglia (B) Satellite cells
(C) Oligodendrocytes (D) Astrocytes
32. Which of the following does not contribute to the resolution attainable by a microscope ?
- (A) The refractive index of the material between the specimen and the lens
(B) The numerical aperture of the lens
(C) The magnitude of the objective lens
(D) The wavelength of the light
33. Which of the following does **not** occur during PCR ?
- (A) Production of many pieces of single-stranded DNA
(B) The amount of DNA doubles with each round of replication
(C) Repeating cycles of heating and cooling DNA
(D) The strands of the original DNA sample are unwound

34. Tendons are composed of _____ connective tissue.
 (A) Areolar (B) Yellow elastic (C) Dense regular (D) Skeletal
35. Which event does not take place during anaphase A and/or anaphase B ?
 (A) Formation of kinetochore microtubules
 (B) Elongation of polar microtubules
 (C) Shortening of astral microtubules
 (D) Movement of kinesin towards the plus end of polar microtubule
36. A light chain gene is constructed from the following segments :
 (A) Variable and constant segments
 (B) Variable, joining and constant segments
 (C) Variable, diversity and constant segments
 (D) Variable, joining, diversity and constant segments
37. In the purine nucleus, carbon 6 is contributed by :
 (A) Glycine (B) CO_2 (C) Aspartate (D) Glutamine
38. Some neurotransmitters can have either excitatory or inhibitory effects depending on the type of :
 (A) Receptors on the postsynaptic neuron
 (B) Synaptic vesicles in the axon
 (C) Neuromodulator involved
 (D) Postsynaptic potentials on the synaptic knob
39. A purely competitive inhibitor of an enzyme has which of the following kinetics effects ?
 (A) Increases K_m without affecting V_{max}
 (B) Decreases V_{max} without affecting K_m
 (C) Increases V_{max} without affecting K_m
 (D) Decreases K_m without affecting V_{max}
40. Which of the following is **not** a step taken to produce recombinant DNA using human DNA ?
 (A) Isolate and purify DNA from tissues and from plasmids
 (B) Use retroviruses to circularize DNA
 (C) Cut both human and plasmid DNA with the same restriction enzymes
 (D) Seal human DNA fragments into plasmids with DNA ligase
41. Oxamate is a competitive inhibitor of which of the following enzymes ?
 (A) Hexokinase (B) Phosphofructokinase
 (C) Lactate dehydrogenase (D) Pyruvate dehydrogenase

42. A high ratio of insulin to glucagon can :
- (A) Promote glycogenolysis (B) Found in Type 1 Diabetes Mellitus
(C) Occurs during fasting state (D) Promotes synthesis of Glycogen
43. The ATP/AMP ratio has a major effect upon the rate of ATP production by glycolysis. ATP and AMP bind to allosteric sites on :
- (A) Hexokinase (B) Glucokinase
(C) Phosphofructokinase-1 (D) Phosphofructokinase-2
44. The function of an adjuvant in a vaccine is :
- (A) Distribution (B) Absorption (C) Antigenicity (D) Metabolism
45. Which of the following statements about dietary fiber is/are correct ?
- (A) Insoluble fiber increases stool bulk and decreases transit time
(B) Water-soluble fiber helps to lower serum cholesterol in most people
(C) Mucilaginous fiber slows the rate of digestion and absorption of carbohydrate
(D) All of the above
46. Creatine kinase is an :
- (A) Transferase (B) Lyase (C) Hydrolase (D) Isomerase
47. Cholesterol inhibits estrogen action through its influence on :
- (A) nER (B) ER α (C) nER II (D) E-RAF
48. One out of the following enzymes can utilize both NAD⁺ and NADP⁺ as a coenzyme :
- (A) Aldehyde dehydrogenase (B) Alcohol dehydrogenase
(C) Glutamate dehydrogenase (D) Glycerol-3-P dehydrogenase
49. Excretion of conjugated bilirubin from liver cells into biliary canaliculi is defective in :
- (A) Gilbert's disease (B) Crigler-Najjar syndrome
(C) Lucey-Driscoll syndrome (D) Rotor's syndrome
50. Which signalling sequence uses both hydrocarbon and ions as second messengers ?
- (A) PKC activation of RNA polymerase
(B) Ras activation of MSK1
(C) Cyclin D/CDK₄ activation of E₂F
(D) RTK activation of MAP kinase

51. The genetic code that directs protein synthesis in human is found in :
 (A) All multicellular organisms, but not in unicellular ones
 (B) No other kind of organism
 (C) All animals, but not in plants
 (D) Virtually all organism
52. What would be the consequence of defective ADH receptors ?
 (A) Diabetes mellitus (B) Dehydration
 (C) Seasonal affective disorders (D) None of the above
53. Which of the following is true ?
 (A) IgM fixes complement (B) IgG does not cross placenta
 (C) IgA binds mast cells (D) IgE binds phagocytes
54. Why can smooth muscle cells remain contracted for longer than striated muscle cells ?
 (A) They lack Z disc
 (B) They store more calcium ions than striated muscle cells
 (C) They are not multinucleated cells
 (D) Their contraction relies on phosphorylation of myosin instead of iron fluxes
55. The inner mitochondrial membrane is rich in which of the following phospholipids ?
 (A) Cardiolipin (B) Lecithin
 (C) Cephalin (D) None of the above
56. The reason for the absence of testosterone in circulation in mammalian females is :
 (A) Testosterone is not produced by the ovary
 (B) Testosterone is fully converted to estradiol
 (C) Testosterone produced is immediately catabolised
 (D) The entire testosterone produced get excreted
57. The carbon atom of urea is derived from :
 (A) Glycine (B) Methionine
 (C) Methylene tetrahydrofolate (D) Bicarbonate
58. In an individual at rest, who has fasted for 12 hours, which of the following occurs ?
 (A) Gluconeogenesis is the major process by which blood glucose is maintained
 (B) Glycogen synthase is activated in liver
 (C) Adenylate cyclase is inactivated in liver
 (D) Phosphorylase, pyruvate kinase and glycogen synthase are phosphorylated in liver

59. All are plant derived alkaloids except :
 (A) Nicotine (B) Menthol (C) Codeine (D) Quinine
60. Estrogen Receptor Activation Factor (E-RAF) is a :
 (A) Estrogen binding protein (B) Antiestrogen binding protein
 (C) DNA binding protein (D) A lipoprotein
61. One of the below is not modifiable risk factor for atherosclerosis :
 (A) Smoking and Obesity (B) Family History
 (C) Hypertension and lipid disorders (D) Diabetes Mellitus
62. C_4 plants show very high rate of photosynthesis as compare to C_3 plants, because of :
 (A) Dicarboxylation (B) Bundle sheath cells
 (C) Absence of photorespiration (D) All the above
63. All of the following are oncogenic except :
 (A) Papilloma virus (B) EB virus
 (C) Herpes simplex virus (D) Varicella zoster virus
64. The glycosaminoglycan which does not contain uronic acid is :
 (A) Dermatan sulphate (B) Chondroitin sulphate
 (C) Keratan sulphate (D) Heparan sulphate
65. Organ of adhesion of bacteria is :
 (A) Capsule (B) Fimbriae (C) Slime (D) Flagella
66. Epinephrine increases the concentration of free fatty acids in plasma by increasing :
 (A) Extra mitochondrial fatty acid synthesis
 (B) Mitochondrial fatty acid chain elongation
 (C) Microsomal fatty acid chain elongation
 (D) Lipolysis in adipose tissue
67. Which of the following factors will affect the measurement of pH using a glass electrode ?
 (A) Temperature (B) Valency of ions present
 (C) Presence of salt (D) Presence of Protein
68. All are natural auxins except :
 (A) Indole acetic acid (B) Napthalene acetic acid
 (C) Phenoxy acetic acid (D) Indole-3-acetic acid