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ROLL No. | | | | | |

QN. BOOKLET No. **008**

TEST FOR POST GRADUATE PROGRAMMES

LIFE SCIECNCES

Time: 2 Hours

Maximum Marks: 450

INSTRUCTIONS TO CANDIDATES

1. You are provided with a Question Booklet and an Optical Mark Reader (OMR) Answer Sheet to mark your responses. Do not soil your OMR Sheet. Read carefully all the instructions given on the OMR Sheet.

2. Write your Roll Number in the space provided on the top of **this page.**

3. Also write your Roll Number, Test Code, Test Centre Code, Test Centre Name, Test Subject and the date and time of the examination in the columns provided for the same on the **Answer Sheet.** Darken the appropriate bubbles with HB pencil.

4. The paper consists of 150 objective type questions. All questions carry equal marks.

5. Each Question has four alternative responses marked **A, B, C** and **D** and you have to **darken** the bubble fully by **HB pencil** corresponding to the correct response as indicated in the example shown on the Answer Sheet. Also write the alphabet of your response with ball pen in the starred column against attempted questions and put an '×' mark by ball pen in the starred column against unattempted questions as given in the example in the OMR Sheet.

6. Each correct answer carries **3** marks and each wrong answer carries **1** minus mark.

7. Please do your rough work only on the space provided for it at the end of this question booklet.

8. You should return the Answer Sheet to the Invigilator before you leave the examination hall. However Question Booklet may be retained with the Candidate.

9. Every precaution has been taken to avoid errors in the Question Booklet. In the event of such unforeseen happenings, suitable remedial measures will be taken at the time of evaluation.

10. Please feel comfortable and relaxed. You can do better in this test in a tension-free disposition.

WISH YOU A SUCCESSFUL PERFORMANCE

SEAL

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LIFE SCIENCES

1. Vacuoles in plant cells

   (A) produce energy for the cells
   (B) synthesis proteins
   (C) defend the cell
   (D) provide turgidity and rigidity to cells

2. The site of oxidation in a cell is the

   (A) mitochondrion
   (B) endoplasmic reticulum
   (C) Golgi apparatus
   (D) ribosome

3. Which organelle is the site of most of the protein synthesis that occurs in the cell?

   (A) Rough enoplasmic reticulum
   (B) Mitochondria
   (C) Golgi apparatus
   (D) Nucleous

4. The phospholipids bilayer in the membrane is made up of which two molecules?

   (A) Hydrophobic tail and hydrophilic head
   (B) Hydrophilic tail and hydrophobic head
   (C) Hydrophobic tail and hydrophobic head
   (D) Hydrophilic tail and Hydrophilic head

5. Actin filaments and microtubules share all of the following properties except

   (A) they are involved in cell motility
   (B) they are intrinsically polar structures
   (C) they can associate with motor proteins
   (D) they are assembled from subunits that are heterodimers

6. What is meant by the term, 'pairing of homologous chromosomes'?

(A) It indicates that two different chromosomes (different genes on each) come together
(B) It indicates that two identical chromosomes (same genes with the same DNA sequences in each gene) come together
(C) It indicates that two similar chromosomes (same genes, but with potentially different DNA sequences in each gene) come together
(D) It is irrelevant, as this does not occur as part of meiosis

7. Which one of the following is a double-stranded DNA virus?

(A) CaMV
(B) HIV
(C) TMV
(D) HCV

8. α and β-tubulin protein in microtubule requires

(A) ATP for polymerization
(B) ADP for polymerization
(C) GTP for polymerization
(D) GDP for polymerization

9. Which of the following are prokaryotic cytoskeleton?
(i) FtsZ (ii) Tubulin (iii) Actin (iv) Crescentin

(A) (i) and (ii)
(B) (ii) and (iii)
(C) (iii) and (iv)
(D) (i) and (iv)

10. Membranes of the following two organelles are contiguous

(A) ER and Golgi
(B) Nucleus and ER
(C) Golgi and plasmamembrane
(D) Golgi and lysosomes

11. Receptor-mediated endocytosis from plasma membrane requires which of the following coat proteins?

(A) Clathrin
(B) Adaptin
(C) Arrestin
(D) Glycophorin

12. If a subcellular fraction from liver tissue exhibits a high level of acid phosphatase activity, it most likely contains

(A) nuclei
(B) lysosomes
(C) endoplasmic reticulum
(D) coated vesicles

13. Colchicine interferes with

(A) chromosome replication
(B) chromosome condensation
(C) spindle formation
(D) separation of daughter chromosomes

14. When cells are placed in a hypertonic medium, the cells

(A) shrink
(B) swell
(C) remains the same
(D) lyse

15. From which subcellular component is the 'microsomal' fraction derived mainly?

(A) Nucleus
(B) Endoplasmic reticulum
(C) Lysosome
(D) Golgi apparatus

16. Which of the following is true about the offsprings of a female carrier of an X-linked recessive disorder and a normal male?

(A) Half of their children will be symptomatic
(B) Half of their daughters will be symptomatic
(C) Half of their sons will be asymptomatic carriers
(D) Half of their daughters will be carriers

17. What would be the frequency of AABBCC individuals from a mating of two AaBbCc individuals?

(A) 1/64
(B) 1/32
(C) 1/16
(D) 1/8

18. Which of the following processes leads to formation of polytene chromosomes?

(A) Nondisjunction of chromatids during meiosis
(B) Recombination between adjacent chromosome segments
(C) Inactivation of one chromosome of each homologous pair
(D) Repeated replication without separation of chromatids

19. Which of the following transposons are present in fruit fly *Drosophila melanogaster*
(i) Retroposon (ii) Ty elements (iii) P elements (iv) Gypsy element

(A) (i) and (iii)
(B) (ii) and (iii)
(C) (iii) and (iv)
(D) (ii) and (iv)

20. Balbiani ring in polytene chromosome are the sites of

(A) DNA replication
(B) lipids synthesis
(C) RNA synthesis
(D) None of the above

21. The essential initiator protein at the *E. coli* origin of replication is

(A) DnaA
(B) DnaB
(C) DnaC
(D) DnaE

22. Okazaki fragments

(A) require the activity of only a DNA polymerase for synthesis
(B) require only RNA polymerase activity for synthesis
(C) are made when DNA is exposed to UV radiation
(D) are composed of both DNA and RNA

23. Satellite DNA consists of

(A) extra chromosomal DNA
(B) short repetitive nucleotide sequences
(C) ribosomal RNA genes
(D) single gene regions

24. Bar bodies are found in

(A) interphase of male cell
(B) interphase of female cell
(C) prophase of female cell
(D) prophase of male cell

25. Common lesions found in DNA after exposure to ultra violet light are

(A) pyrimidine dimers
(B) singal strand breaks
(C) base deletions
(D) purine dimmers

26. A mutation in a codon leads to the substitution of one amino acid with another. What is the name for this type of mutation?

(A) Nonsense mutation
(B) Missense mutation
(C) Frameshift mutation
(D) Promoter mutation

27. QTL analysis is used to

(A) identify RNA polymerase binding sites
(B) map genes in bacterial viruses
(C) determine which genes are expressed at a developmental stage
(D) identify chromosome regions associated with a complex trait in a genetic cross

28. Zinc finger proteins and helix-turn-helix proteins are

(A) types of DNA-binding proteins
(B) involved in the control of translation
(C) components of ribosomes
(D) part of the hemoglobin in blood cells

29. Which among the following is amber codon?

(A) UGA
(B) UAA
(C) UAG
(D) UGG

30. The term 'pleiotropic' means

(A) a single gene determines more than one phenotype for an organism
(B) one gene masks the expression of a different gene for a different trait
(C) differing alleles for a trait in an individual
(D) genes that are mutated

31. 5-bromo-4-chloro-3-indolyl-β-D-galactopyranoside is ..... of β galactosidase

(A) an inducer
(B) a substrate
(C) an inhibitor
(D) an activator

32. Red-green color blindness is X-linked in humans. If a male is red-green color blind, and both parents have normal color vision, which of the male's grandparents is most likely to be red-green color blind?

(A) Maternal grandmother
(B) Maternal grandfather
(C) Paternal grandmother
(D) Paternal grandfather

33. *E. coli* O157:H7 is thought to have acquired enterohemorrhagic genes from

(A) clostridium
(B) bacillus
(C) shigella
(D) listeria

34. Bacterial spores

(A) are not resistant to antibiotics
(B) allow the bacteria not to multiply in adverse condition
(C) can be identified with gram stains
(D) are killed by temperature of 120°C for 20 minutes

35. Diphtheria toxin catalyzes ADP – ribosylation and inactivates

(A) eEF-1
(B) EF-Tu
(C) eEF-2
(D) EF-G

36. Chemilithotrophs are those bacteria which can utilize

(A) inorganic material as the energy source
(B) light as energy source
(C) organic compound as electron source
(D) crude oil as carbon source

37. Archaeal cells usually do not contain peptidoglycan, rather contain pseudopeptidoglycan which is mainly composed of

(A) N-acetylmuramic acid and L-amino acids
(B) N-acetyltalosaminuronic acid and D-amino acids
(C) N-acetylmuramic acid and D-amino acids
(D) N-acetyltalosaminuronic acid and L-amino acids

38. The minimum distance at which a microscope is capable of distinguishing two points as separate is its

(A) magnification
(B) illumination
(C) resolving power
(D) scattering

39. Because penicillin prevents peptidoglycan synthesis, it is more effective on ..... cells.

(A) gram positive
(B) gram negative
(C) both (A) and (B)
(D) human RBC

40. The following drugs act by inhibiting cell wall synthesis of the micro-organisms

(A) vancomycin
(B) gentamycin
(C) amphotericin B
(D) erythromycin

41. After Gram's staining *Mycobacterium sp.* will appear

(A) pink
(B) purple
(C) unstained
(D) pale pink

42. *Saccharomyces cerevisiae* is used for the production of

(A) antibiotic
(B) ethanol
(C) protease
(D) cellulose

43. *Helicobacter pylori* can grow in the stomach because it

(A) hides in macrophages
(B) makes a capsule
(C) makes NH_3
(D) makes HCl

44. Toxic shock syndrome is caused by

(A) Pathogenic *E. coli*
(B) *Micrococcus luteus*
(C) *Staphylococcus aureus*
(D) *Streptococcus mutans*

45. Each of the following organisms is an important cause of urinary tract infections except

(A) *Escherichia coli*
(B) *Proteus mirabilis*
(C) *Klebsiella pneumonia*
(D) *Bacteriodes fragilis*

46. Quorum sensing system associated with bacterial pathogenesis is reported in

(A) *Vibrio fischeri*
(B) *Pseudomonas aeruginosa*
(C) *Vibrio harveyi*
(D) Rhizobium

47. Desulfovibrio desulfricants is an example of

(A) autotroph
(B) chemotroph
(C) organotroph
(D) mixotroph

48. Which one is not causing gas gangrene in man?

(A) *Clostridium histolyticum*
(B) *Clostridium septicum*
(C) *Clostridium novyi*
(D) *Clostridium sporogenes*

49. Which of the following is true about tetanus acquired through traumatic wound?

(A) The diagnosis is depend on microbial findings
(B) *Clostridium tetani* travels via the nerves to the anterior horn cells in the spinal cord
(C) The tetanospasmin component of the extoxin acts on the post-synaptic neurones and prevents impulse transmission
(D) The patient should be given antitoxin intravenously

50. The peptide bond in proteins is

(A) nonpolar, and fixed in a trans conformation
(B) nonpolar, but rotates to three preferred dihedral angles
(C) Planar, and usually found in a trans conformation
(D) Planar, but rotates to three preferred dihedral angles

51. If the enthalpy change for reaction is zero, DG° is equal to

(A) ΔH
(B) $\ln K_{eq}$
(C) $T\Delta S^{\circ}$
(D) $-T\Delta S^{\circ}$

52. When α subunit dissociates from an initiated RNA polymerase

(A) it can bind a core enzyme to reform holoenzyme
(B) it hydrolyzes ATP until rebound by core enzyme
(C) it leaves behind an elongating species complexed with Rho factor
(D) it remains bound to the promoter consensus sequence

53. The hormone epinephrine stimulates glycogen breakdown to G-6-P

(A) indirectly, by first stimulating adenylate cyclase to make cAMP
(B) directly, by binding to glycogen phosphorylase
(C) only in the liver
(D) only in muscle cells

54. Which of the following is not a mechanism for altering the flux of metabolites through the rate-determining step of a pathway?

(A) Allosteric control of the enzyme activity
(B) Covalent modification of the enzyme
(C) Diffusional coupling between adjacent active sites
(D) Substrate cycles between two reactions

55. ATP is composed of

(A) Adenosine, Ribose, 3 phosphate groups
(B) Adenine, Ribose, 3 phosphate groups
(C) Adenine, Thymine, 2 phosphate groups
(D) Amino group, Thymine, Phosphate group

56. Folic Acid

(A) is water insoluble
(B) deficiency leads to aplastic anaemia
(C) deficiency occurs with methatrexate treatment
(D) deficiency is associated with risk of neural tube defect in the newborn

57. A principal difference between prokaryotic - and eukaryotic DNA replication is

(A) completely different proteins/enzymes in eukaryotes
(B) multiple origins in eukaryotes
(C) no requirement for topoisomerase activity in prokaryotes
(D) the absence of a nucleus in prokaryotes

58. According to Beer-Lambert's law, what will be the absorbance when $I=I_0/10$?

(A) 0
(B) 1.0
(C) 0.1
(D) 100

59. On a Ramachandran plot the entries for hemoglobin would be clustered around

(A) all four corners
(B) the extended chain conformation
(C) the left-handed α-helix conformation
(D) the right-handed α-helix conformation

60. For determining the C-terminal amino acid of a polypeptide chain, the reagent that would be useful is

(A) trypsin
(B) carboxy peptidase
(C) phenyl isothiocyanate
(D) 1N HCl

61. The concentration of sphingomyelins is increased in

(A) Gaucher's disease
(B) Fabry's disease
(C) Febrile disease
(D) Niemann-pick disease

62. How many molecules of ATP are gained by oxidation of one molecule of glucose through direct oxidation pathway?

(A) 2
(B) 38
(C) 36
(D) 8

63. The rate limiting step in fatty acid synthesis is catalysed by

(A) acety CoA Carboxylase
(B) ATP-citrate lyase
(C) malic enzyme
(D) pyruvate dehydrogenase

64. Which of the following enzymes plays a direct role in the biosynthesis of collagen?

(A) Prolyl hydroxylase
(B) Tyrosine hydroxylase
(C) Choline oxidase
(D) Momoamine oxidase

65. A water-soluble globular protein is most likely to have the highest proportion of which of the following amino acid residues buried within its core?

(A) Serine
(B) Histidine
(C) Isoleucine
(D) Glutamate

66. The basis for the treatment of phenylketonuria is

(A) inhibition of enzymes that convert phenylalanine to toxic by-products
(B) rapid excretion of toxic by-products of phenylalanine
(C) restriction of dietary intake of phenylalanine
(D) stimulation of alternative pathways of phenylalanine metabolism

67. HMP shunt occurs in

(A) cytosol
(B) mitochondria
(C) endoplasmic reticulum
(D) Golgi apparatus

68. Bones in the skull that develop in membrane include

(A) body of sphenoid
(B) parietal bone
(C) mastoid of temporal bone
(D) mandible

69. In frog, gastrulation is completed by

(A) epiboly
(B) emboly
(C) delamination
(D) epiboly and emboly

70. The nervous system, epidermis, hairs and nails are derivatives of

(A) endoderm
(B) mesoderm
(C) ectoderm
(D) chordomesoderm

71. Embryo sac in a hen's egg is formed by

(A) ectoderm
(B) mesoderm
(C) somatic mesoderm and endoderm
(D) splanchnic mesoderm and ectoderm

72. The eutherian placenta is derived from

(A) yolk sac
(B) chorion
(C) allantois
(D) allantois and chorion

73. A child is born with an extra chromosome in each of its cells. This condition is usually the result of

(A) nondisjunction
(B) crossing over
(C) segregation
(D) hybridization

74. Coelom is the cavity between the two layers of

(A) nephrotome
(B) myotome
(C) lateral plate mesoderm
(D) endoderm

75. Cartilage and connective tissue of the vertebrate limb form from

(A) the ectodermal epithelium of the limb bud
(B) the mesodermal mesenchyme of the limb bud, derived from lateral plate ectoderm
(C) mesodermal cell that migrate into the limb bud from the somites
(D) the polarizing region

76. Mutations in homeotic genes can lead to what type of developmental defect?

(A) Several adjacent segments will be missing from an otherwise intact embryo
(B) The embryo will develop with every other segment failing to form
(C) Segment and compartment boundaries will fail to form
(D) The development of segments will be changed wholesale from their normal identity to that of a different segment

77. Oocytes can be frozen in liquid nitrogen. At which phase of the cell cycle are these cells at the time of freezing?

(A) Meiosis, Metaphase I
(B) Meiosis, Metaphase II
(C) Mitosis, Metaphase
(D) Meiosis or Mitosis, Interphase

78. During which stage in embryonic development do cells differentiate into three germ layers?

(A) Blastula
(B) Neurula
(C) Gastrula
(D) Morula

79. A Grafian follicle is

(A) an immature developing follicle
(B) a mature follicle ready to ovulate
(C) a follicle undergoing apoptosis
(D) ovulated follicle

80. In amphibians, the egg is covered by

(A) zone pellucide
(B) chorion
(C) vitelline membrane
(D) None of the above

81. What type of cells help synchronize the development of sperm in seminiferous tubules?

(A) Sertoli cells
(B) Nurse cells
(C) Epidydimal cell
(D) Follicle cell

82. In Xenopus and most vertebrates there is a certain "factor" that arrests the secondary oocyte in metaphase II of meiosis. What is the name of this "factor"?

(A) Mitosis promoting factor (MPF)
(B) Vitellogenisis factor
(C) Cytostatic factor
(D) None of the above

83. Calyptra is seen in

(A) gametophyte
(B) sporophyte
(C) archegoniophore
(D) antheridiophore

84. Heterothallism was discovered by

(A) Blakeslee
(B) Faraday
(C) Alexopoulos
(D) Gaumann

85. In Phytophthora, the asexual reproductive bodies behave as

(A) conidia
(B) sporangia
(C) conidiosporangia
(D) Both conidia and conidiosporangia

86. What energy-rich organic compound is produced as a result of the Calvin cycle?

(A) NADPH
(B) CO_2
(C) ATP
(D) glucose

87. Plants which are not differentiated into roots, stems and leaves are grouped under

(A) thallophytes
(B) gymnosperms
(C) pteriodophytes
(D) spermatophytes

88. Which of the following is a predatory fungus?

(A) *Puccinia*
(B) *Alternaria*
(C) *Fusarium*
(D) *Arthrobotrys*

89. Which of the following plays no role in the movement of water through xylem of plants?

(A) Capillarity
(B) Root pressure
(C) H+/ATPase pump at the xylem element membrane
(D) Transpirational pull

90. Abscisic acid closes stomata by inhibiting

(A) Proton pump
(B) Calcium pump
(C) Potassium pump
(D) ATP synthesis

91. The accumulation of one of the following causes seed dormancy

(A) cytokinin
(B) auxin
(C) abscisic acid
(D) gibberellin

92. Root pressure is due to

(A) passive absorption
(B) increase in transpiration
(C) low osmotic potential in soil
(D) active absorption

93. In Casparian strip prohibits H_2O from passing through the

(A) Apoplast
(B) Symplast
(C) Plasmodesmata
(D) Stele

94. Conversion of NO_3^- to NO_2^- occurs in

(A) cytosol of plant cells
(B) chloroplast
(C) mitochondria
(D) peroxisome

95. The pigment that plays a key role in photomorphogenesis is

(A) chlorophyll
(B) phytochrome
(C) cytochrome
(D) anthocyanin

96. Little leaf of brinjal is caused by

(A) mycoplasma
(B) fungi
(C) virus
(D) bacteria

97. The fruits after ripening becomes soft, it is due to the

(A) dissolution of middle lamella
(B) formation of H_2
(C) due to turgor pressure
(D) None of the above

98. Chlorophyll in chloroplasts is located in

(A) grana
(B) stroma
(C) ribosomes
(D) pyrenoid

99. Branch roots of the primary root of a flowering plant are initiated in the

(A) cortex
(B) pericycle
(C) epidermis
(D) endodermis

100. Which of the following plant hormones hastens apple ripening?

(A) Gibeberellin
(B) Abscisic acid
(C) Cytokinin
(D) Ethylene

101. Which technique is used to introduce genes into dicots?

(A) Electroporation
(B) Particle acceleration
(C) Microinjection
(D) Ti plasmid infection

102. The nictonine occurs in

(A) *Neurospora crassa*
(B) *Nicotiana tabacum*
(C) *Nisearia spp.*
(D) *Nelumbium spp.*

103. Striated muscle is also called

(A) cardiac muscle
(B) smooth muscle
(C) skeletal muscle
(D) involuntary muscle

104. The fastest growing carp is

(A) Catla
(B) Rohu
(C) Mrigal
(D) Silver carp

105. A limbless reptile is

(A) Siren
(B) Ophiosaurus
(C) Triturus
(D) Cobra

106. Tortoises and turtles are included under order

(A) Reptilian
(B) Squamata
(C) Chelonian
(D) None of the above

107. Which of the following is true about neurotransmitters?

(A) Glycine is found in the cerebral cortex
(B) Acetylcholine is mainly secreted by the neuromuscular junction
(C) Serotonin is secreted by the pineal body and parasympathetic neurones
(D) Dopamine is only secreted in the mid-brain

108. When rigor mortis occurs in a skeletal muscle,

(A) there are adequate levels of ATP in the muscle
(B) cross-bridge can be easily broken
(C) sarcomere length remains constant
(D) all of the above

109. The cross bridges of the sarcomere in skeletal muscle are made up of

(A) actin
(B) myosin
(C) troponin
(D) tropomyosin

110. Which of the following hormones does not act by a second messenger system?

(A) Glucagons
(B) Epinephrine
(C) Luteinizing hormone
(D) Aldosterone

111. The most important factor in determining the percent oxygen saturation of hemoglobin is

(A) the partial pressure of oxygen
(B) acidity
(C) the partial pressure of carbon dioxide
(D) temperature

112. Calcium ions in skeletal muscle

(A) are stored in the transverse tubules
(B) bind to sites on troponin molecules
(C) only can bind to sites on actin molecules
(D) all of the above

113. Most of the CO_2 transported in the blood is

(A) dissolved in plasma
(B) in carbamino compounds formed from plasma proteins
(C) bound to Cl^-
(D) in HCO_3^-

114. The tentacles of *Hydra* are

(A) pinnate
(B) hollow
(C) solid
(D) frilled

115. The body cavity of earthworm is a

(A) pseudocoel
(B) haemocoel
(C) enterocoel
(D) schizocoel

116. The wisdom tooth in man is

(A) 1st molar
(B) last molar
(C) 1st premolar
(D) last incisor

117. In human, the large bone extending from hip to the knee is called the

(A) tibia
(B) femur
(C) patella
(D) fibula

118. Most of the reabsorption of vital molecules from the primary urine occurs in

(A) Bowman's capsule
(B) loop of Henle
(C) glomerulus capillaries
(D) protonephridia

119. As oysters evolved, their shells became

(A) narrower
(B) flatter
(C) thicker
(D) more coiled

120. Using the molecular record to determine phylogenetic relationships is based on the assumption that

(A) nucleotide sequences do not change over time
(B) nucleotide sequences change at a fairly constant rate over time
(C) nucleotide sequences change randomly and erratically over time
(D) evolutionary changes occur in phenotypes but not in genotypes

121. The change in coloration of the peppered moth is an example of

(A) a population with disruptive selection
(B) a population with directional selection
(C) a population with stabilizing selection
(D) a population with no selection

122. Microevolution takes place due to

(A) somatogenic variation
(B) blastogenic variation
(C) continuous variation
(D) successive variation

123. Non-geographic speciation can be found in

(A) parapatric speciation
(B) peripatric speciation
(C) allopatric speciation
(D) sympatric speciation

124. The scientist who cut off the tails of mice of successive generations to prove Lamarck's theory wrong was

(A) Weismann
(B) Haeckel
(C) Darwin
(D) Wallace

125. What is the relationship between the wing of a bird and the wing of a bat?

(A) They are homologous because they represent modified forms of a trait present in a common ancestor
(B) They are analogous because while each carries out the same function, this trait has arisen independently as a result of convergence
(C) Both (A) and (B)
(D) They represent derived homologies

126. In the geological time scale, the age of mammals is

(A) paleozoic era
(B) mesozoic era
(C) coenozoic era
(D) precambian era

127. Hominoids are ancestral to

(A) apes
(B) humans
(C) Both apes and humans
(D) Neither apes nor humans

128. Fossil evidence indicates that from 30,000 to 40,000 years ago, ... coexisted with .....

(A) Australopithecus, Neanderthals
(B) Homo habilis; Cro-magnons
(C) Australopithecus; Cro-magnons
(D) Cro-magnons; Neanderthals

129. The phenomenon of genetic drift is most likely to occur in populations that are

(A) small and inbred
(B) undergoing gene flow
(C) allopatric
(D) large and panmictic

130. Which of the following is a post-zygotic isolating mechanism in speciation?

(A) Behavioural isolation
(B) Seasonal isolation
(C) Fertilization failure
(D) Hybrid sterility

131. Which of the following evolutionary processes are random?
(i) gene flow (ii) mutation (iii) natural selection (iv)speciation (v) genetic drift

(A) (i) and (ii)
(B) (i), (ii) and (iv)
(C) (ii), (iv) and (v)
(D) (ii) and (v)

132. The early belief of the spontaneous origin of life was disproved by

(A) Charles Darwin
(B) Louis Pasteur
(C) Koch
(D) Lederberg

133. Cytotoxic T cells are called into action by the

(A) presence of interleukin – 1
(B) presence of interleukin – 2
(C) presence of interleukin – 3
(D) presence of interleukin – 4

134. Bacille Calmette-Guerin (BCG) is sometimes used for

(A) passive immunization for tuberculosis
(B) inducing production of neutralizing antibody
(C) inducing antipili antibody production
(D) nonspecific potentiation of the immune response

135. An attenuated vaccine is composed of

(A) killed microorganisms
(B) living, weakened microorganisms
(C) inactivated bacterial toxins
(D) purified macromolecules

136. Which of the following best describes type I hypersensitivity?

(A) The reaction of T_{DTH} cells, cytokines and macrophages
(B) The formation of immune complexes that are deposited on basement membranes
(C) Complement-dependent lysis of cells
(D) The release of physiological mediators from IgE-bound mast cells and basophils

137. Di Georges syndrome is one in which

(A) B cells fail to form
(B) Stem cells fail to form
(C) T cells fail to form
(D) Agammaglobulenimia

138. The iimunoglobulin gene rearrangement that takes place in activated B-cells is

(A) V-D-J recombination
(B) D-J recombination
(C) V-J recombination
(D) Class switch recombination

139. Generation of antigenic peptide for MHC class-1 occurs in

(A) endoplasmic reticulum
(B) cytosol
(C) golgi apparatus
(D) endosome

140. A graft exchanged between brother and sister is termed

(A) xenograft
(B) isograft
(C) autograft
(D) allograft

141. Properties of haptens include

(A) immunogenicity and reactivity
(B) immunogenecity but no reactivity
(C) reactivity but no immunogenecity
(D) Neither immunogenecity nor reactivity

142. IgG

(A) has a molecular weight of 50,000 kDa
(B) is monovalent
(C) comprises the majority of circulating antibody in serum
(D) is a pentamer

143. Which one of the following is the single, most useful laboratory test to diagnose multiple sclerosis?

(A) IgG level in serum
(B) Positive ANA in serum
(C) IgG : albumin ratio in CSF
(D) Isoelectric focusing of cerebrospinal fluid

144. Kahn Test is an example of

(A) flocculation test
(B) agglutination test
(C) complement fixation test
(D) precipitation test

145. The relative level of specific IgM antibodies can be of diagnostic significance because

(A) IgM is easier to detect than the other isotypes
(B) viral infection often results in very high IgM responses
(C) IgM antibodies are more often protective against reinfections than are the other isotypes
(D) relatively high levels of IgM often correlate with a first recent exposure to the inducing agent

146. The immunoglobulin fold is

(A) found only in IgG molecules
(B) composed of two antiparallel β-strands folded into a globular domain
(C) a β-barrel composed of a three and a four-stranded antiparallel β-sheet
(D) found six times in the IgG molecule

147. Monoclonal antibodies produced by hybridoma technology

(A) uses usually of human origin
(B) are each the results of immortalization of a single monocyte
(C) usually have specificity predetermined by prior immunization
(D) are prepared by fusion of T lymphocytes and myeloma cells

148. Which of the following cell types are least effective against extracellular bacterial pathogens?

(A) B cells
(B) Cytotoxic T cells
(C) Helper T cells
(D) Neutrophils

149. Macrophages

(A) circulate in the blood stream
(B) produce nitric acid
(C) have receptor for IgM
(D) are the last leukocytes to arrive at the site of a skin infection

150. Opsonins include

(A) perforin
(B) magainins
(C) C9
(D) C3b.

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