A

18735 **120 MINUTES**

1. Which of the following is NOT a post-translational modification in a mammalian system?
   A) Palmitoyalation B) Glycosylation
   C) Peptidylation D) Phosphorylation

2. Which one of the following bases has the largest hydrogen bonding possibility?
   A) Adenine B) Guanine
   C) Cytosine D) Uracil

3. Thyroxin releasing hormone (TRH) receptor belongs to:
   A) Nuclear receptor family
   B) Receptor tyrosin kinase family
   C) G-protien – coupled receptor family
   D) Guanylate cyclase receptor family

4. The fungal group presently classified under protists is:
   A) Zygomycetes B) Oomycetes
   C) Deuteromycetes D) Discomycetes

5. Name the common Indian bird that is generally seen is groups (aggregation)
   A) Bulbul B) Warbler
   C) Babbler D) Sun bird

6. The fungus associated with human oral or vaginal infection is:
   A) Fusarium B) Aspergillus
   C) Candida D) Pneumocystis

7. The wings of insects and the wings of bats represent a case of:
   A) Divergent evolution B) Convergent evolution
   C) Parallel evolution D) Neutral evolution

8. In which ecosystem is the detritus pathway of energy flow most important?
   A) Lakes B) Grasslands
   C) Tropical rain forests D) Oceans

9. Which one of the following is unfavourable for protein folding?
   A) Hydrophobic interaction B) Van dar Waals interaction
   C) Conformational entropy D) Hydrogen bonding

10. Which one of the following is a type of intercellular junction in animal cells?
    A) Middle lamella B) Plasmodesmata
    C) Desmosomes D) Glycocalyx

11. A weed is assumed to be dispersed randomly in a meadow. What statistical distribution will describe the dispersion correctly?
    A) Binomial B) Negative Binomial
    C) Poisson D) Normal

12. Individuals with greater mass have a smaller surface area to volume ratio, which helps to conserve heat. This is known as
A) Leibig's rule B) Cope's rule
C) Gloger's rule D) Bergmann's rule

13. Which one of the following is NOT an extracellular matrix protein?
A) Fibronectin B) Vitronectin C) Laminin D) Cyclin

14. A chromosome aberration leads to change in the order of genes in a genetic map but does not alter its linkage group. This is due to
A) Translocation B) Recombination
C) Transposition D) Inversion

15. The part of the embryo from which the ectoderm, mesoderm and endoderm are formed in chick is known as
A) Primitive streak B) Hypoblast
C) Epiblast D) Cytotrophoblast

16. The movement of a single cell was required to be continually monitored during development. This cell was marked with a reporter gene. To visualize this movement one would use:
A) Phase contrast microscopy B) Bright field microscopy
C) Fluorescence microscopy D) Atomic force microscopy

17. Which of the following organisms do not possess the ability to fix nitrogen?
A) Organisms specialized for high altitude
B) Marine plankton
C) Eukaryotic organisms
D) Acidophilic organisms

18. Which of the following greenhouse gas has got highest atmospheric lifetime?
A) CO_2 B) CH_4 C) N_2O D) CFC_s

19. Which of the following evolutionary processes played an important role in the evolution of complex immune system?
A) Reproductive isolation B) Adaptive radiation
C) Neutral evolution D) Co-evolution

20. The effect of nonsense mutation could be nullified by reversion as well as suppression. Which of the following processes will help to distinguish between the two kinds of revertants?
A) Complementation B) Transgenesis
C) Test for allelism D) Recombination

21. 2-Aminopurine induces mutation by:
A) Base pair change B) Frameshift
C) Duplication D) Insertion

22. Which of the following is an intracellular anchor protein?
A) Vitronectin B) Vinculin C) Integrin D) Elastin

23. Which one of the following interaction plays a major role in stabilizing B-DNA?
A) Hydrogen bond B) Hydrophobic interaction
C) Van der Wall's interaction D) Ionic interaction

24. Major disadvantage of using liposome as a targeted drug delivery vehicle is that
A) It gets internalized by phagocytosis inside lysosomes
B) It is very unstable and has low shelf-life
C) It gets intercalated in cell membranes
D) It's drug entrapment efficiency is very low

25. During DNA replication, events at the replication fork require different types of enzymes having specialized functions except:
A) DNA polymerase III B) DNA gyrase
C) DNA ligase D) DNA glycosylase

26. The specificity of tRNA recognition by a aminoacyl tRNAsynthetase that is intrinsic to the tRNA molecule lies on:
A) Acceptor stem B) Acceptor stem and anticodon loop
C) Anticodon loop D) D-arm

27. Viral gene expression after T3 bacteriophage infection is controlled by:
A) Repressor molecule B) Slow injection of nucleic acid
C) Modification of RNA polymerase D) DNA polymerase

28. Which one of the following is responsible for the ejection of milk from mammary glands in mammals?
A) Oxytocin B) Prolactin
C) Serotonin D) Melatonin

29. Character similarity that can be misinterpreted as common descent is called:
A) Symplesiomorphy B) Synapomorphy
C) Homology D) Homoplasy

30. Mutation at two different loci of the same gene X results in altered functions. These two mutated versions of the gene X are called
A) Alleles B) Complementation groups
C) Interrupted genes D) Linkage groups

31. A gene encoding tRNA undergoes a mutational event in its anticondon region that enables it to recognize a mutant nonsense condon and permit completion of translation. Such a mutation is known as
A) Silent mutation B) Neutral mutation
C) Reversion D) Nonsense suppressor

32. A paraphyletic group
A) Contains unrelated organisms
B) Includes the most recent common ancestor but not all of its descendents
C) Includes all the representatives of a clade but not the most recent common ancestor
D) Contains all the representatives of a clade and the most recent common ancestor

33. The use of biotinylated secondary antibody in ELISA
A) Increases the sensitivity of the assay but compromises the specificity
B) Increases the sensitivity of the assay without compromising the specificity
C) Does not alter either sensitivity or specificity
D) Decreases both sensitivity and specificity

34. Which is the best method for checking mycoplasma contamination in a mammalian cell line?
A) Southern hybridization B) ELISA
C) PCR D) Western hybridization

35. Which of the following pairings is incorrect?
A) Linnaeus: 2 kingdoms B) Chatton: 2 empires
C) Whittaker: 5 kingdoms D) Cavalier-Smith: 4 kingdoms

36. When a single specimen is clearly designated in the original description, this specimen is known as:
A) Paratype B) Holotype C) Allotype D) Neotype

37. Which definition is correct?
A) A dominant allele is expressed only if homozygous.
B) A dominant allele is expressed only in a heterozygote.
C) A recessive allele is expressed only in a homozygote.
D) A recessive allele is expressed only in a heterozygote.

38. Which of the following is best suited to treatment with gene therapy?
A) A dominant mutation (such as in Huntington's disease).
B) A recessive mutation (such as in cystic fibrosis).
C) An extra chromosome (such as in Down syndrome).
D) Gene amplification (such as in breast cancer).

39. A man who carries an X-linked allele will pass it on to
A) All of his daughters B) Half of his daughters
C) All of his sons D) Half of his sons

40. ATP is used indirectly for which of the following processes?
A) Accumulation of Ca^{2+} by the sarcoplasmic reticulum (SR)
B) Transport of Na^{+} from intracellular to intracellular fluid
C) Transport of K^{+} from extracellular to intracellular fluid
D) Absorption of glucose by intestinal epithelial cells

41. Degeneration of dopaminergic neurons has been implicated in:
A) Schizophrenia B) Parkinson's disease
C) Myasthenia gravis D) Curare poisoning

42. Blood volume affects cardiac output primarily by directing influencing
A) Heart rate B) Peripheral resistance
C) Arterial blood pressure D) Venous blood pressure

43. In the calcium regulatory system:
A) The calcitonin gland responds to high calcium levels.
B) The calcitonin gland responds to low calcium levels.
C) Calcitonin release causes increased release of calcium from bones.
D) Calcitonin release causes decreased release of calcium from bones.

44. The gene responsible for initiating male development in a fetus is the:
A) XY gene B) MIF gene
C) STD gene D) SRY gene

45. The hormone most directly associated with the stress response is:
A) Cortisol B) Thyroxine (T4)
C) Triiodothyronine (T3) D) Growth hormone

46. In a chemical synapse, the neurotransmitter is moved across the synaptic cleft by:
A) Actin filaments B) G-protiens
C) Synaptic vesicles D) Diffusion

47. India's only wild ape is:
A) The Hanuman Langur B) The Rhesus Macaque
C) The Hoolock Gibbon D) The Lion-Tailed Macaque

48. Which is not a biosphere reserve?
A) Little Rann of Kutch, Gujarat
B) Nilgiri Biosphere Reserves, Tamil Nadu
C) Nicobar Islands, Andaman and Nicobar
D Cold Desert, Himachal Pradesh

49. The first successful use of gene therapy was in:
A) Genetic diseases B) Cancer
C) Endocrine disorders D) Cardiovascular diseases

50. Which of the following is not a programming language in Bioinformatics?
A) Visual Basic B) C++ C) Python D) Java

51. Which of the following sequence would most likely to be a folded RNA structure?
A) UUUCGAAGUCGUGUGA B) AAAGCCCGAGUUUUAGC
C) UUCGGUCCAAACCCGGU D) CGUUUCUCACAUGCAUC

52. A mRNA coding for secretary protein, when translated using free ribosome under in-vitro conditions, resulted in a 400 kDa protein. The same mRNA when translated using the rough endoplasmic reticulum resulted in a 360 kDa protein. The difference in the molecular weight of the two peptides is due to the loss of:
A) 20 kDa peptide from N terminal and 20 kDa peptide from C terminal
B) 10 kDa peptide from N terminal and 30 kDa peptide from C terminal
C) 40 kDa peptide from N terminal
D) 40 kDa peptide from C terminal

53. Consider the effects of two enzymes. Enzyme A catalyses the reaction ATP+GDP=ADP+GTP whereas the enzyme B catalyses the reaction $NADH+NADP^+ = NAD^+ + NADH$. Say which of the following is not true?
A) Both enzymes are beneficial to cell
B) Enzyme A is beneficial whereas enzyme B is detrimental to cell
C) Enzyme B is beneficial whereas enzyme A is detrimental to cell
D) Both enzymes are detrimental to cell

54. The most common amino acid residues found in the lipid-water interface is:
A) Trp, Phe B) Val, His C) Ala, Asp D) Trp, Tyr

55. $Na^+ K^+$ ATPase pump does not interact with
A) Ankyrin B) Cofilin C) IP3R D) Caveolin

56. The key amino acid residue in movement of both Na^+ and K^+ and $Na^+ K^+$ ATPase pump
A) Asp B) Glu C) His D) Lys

57. Which of the following organism likely to have the highest percentage of unsaturated fatty acids in their membrane?
A) Polar bear B) Thermophilic bacterium
C) Desert iguana D) Antarctic fish

58. Channel proteins function by
A) Using the energy from ATP hydrolysis to transport ions
B) Passive transport of ions down their elelctrochemical gradients
C) Moving one molecule at a time with each cycle of opening and closing
D) Active transport of ions down their electrochemical gradients

59. In the cAMP second messenger system
A) The ligand binds to a G protein
B) Protein kinase A phosphorylates IP3 receptors
C) cAMP activates phospholipase C
D) Gsα-GTP activates adenylate cyclase

60. Which method is better suited for the identification of actively growing bacteria or viruses?
A) BrdU- enrichment B) Suppressive subtraction hybridization
C) Stable isotope probing D) RT-PCR

61. Exosome in eukaryotes involves in all the following except:

A) rRNA processing B) tRNA processing
C) polyadenylation D) mRNA degradation

62. Which of the following is the correct statement?

1. Free ribosomes and membrance ribosomes are identified
2. 5 – 5 bound formation occurs in the ER lumen
3. When cells are disrupted by homegenisation, the endoplasmic reticulum is fragmented into many small closed vesicles called imcrosimes

A) 1 and 2 B) 2 and 3 C) 1 and 3 D) 1, 2 and 3

63. Match the enzyme column A with the product in column B that it produces

Column A		Column B
a.	Guanylcyclase	1. cAMP
b.	Adenycyclase	2. DAG and IP3
c.	Ophospholipidase – C	3. cGMP
d.	Phosphatidylinositol	4. Phosphatidylinositol 4 – phosphate 4, 5 – biphospate (PIP) kinase (PIP2)

A) a-3, b-1, c-2, d-4 B) a-2, b-3, c-1, d-4
C) a-4, b-3, c-2, d-1 D) a-4, b-1, c-2, d-3

64. Match the list I with the list II and select the correct answer using the code given below.

List I		List II
a.	Recombination DNA	1. Marker gene/reporter
b.	Agrobacterium	2. DNA ligase
c.	Sticky ends	3. T – DNA
d.	Plasmids	4. Restriction enzymes

A) a-3, b-4, c-1, d-2 B) a-3, b-4, c-2, d-1
C) a-4, b-3, c-1, d-2 D) a-4, b-3, c-2, d-1

65. Match the protozoans with their vectors and select the correct answer.

a)	Active during day time	1. Vesperal
b)	Active during dusk	2. Diurnal
c)	Active during dawn	3. Auroral
		4. Crepuscular

	a	b	c
A)	1	2	3
B)	2	1	3
C)	4	2	3
D)	3	1	4

66. Which is the date of the starting point of zoological nomenclature as fixed by the ICZN?

A) 1 January 1900 B) 1 January 1853
C) 1 January 1758 D) 23 May 1707

67. The number of genes in the human mitochondria is

A) 17 B) 21 C) 37 D) 27

68. Which among the following is/ are associated with tactile sensation?

1. Meissner's corpuscles
2. Krause end bulbs
3. Pacinian corpuscles
4. Ruffini corpuscles

A) 1 and 2 B) 2 and 4 C) 2 only D) 1, 2, 3 and 4

69. The principle of osmosis is applied in:

A) Perfusion B) Infusion of saline
C) Dialysis D) All of the above

70. In nerve cells,

A) The level of Sodium ions is lower outside than inside.
B) The level of Potassium ions is higher outside than inside.
C) The level of Potassium ions is higher inside than outside
D) The levels of Potassium ions inside and that of the Sodium ions outside are equal.

71. Identify the correct statement:

A) The world Environment Day is celebrated on May 22nd, the World Wildlife Day is celebrated on June 5th and the National Science Day of India is celebrated on February 28th
B) The world Environment Day is celebrated on June 5th, the World Wildlife Day is celebrated on March 3rd and the National Science Day of India is celebrated on February 28th
C) The world Environment Day is celebrated on June 5th, the International Day for Biodiversity is celebrated on March 3rd and the National Science Day of India is celebrated on February 28th
D) The world Environment Day is celebrated on June 5th, the World Wildlife Day is celebrated on March 3rd and the National Science Day of India is celebrated on November 7th, the birth date of Sir. C. V. Raman.

72. Glucagon is secreted by:

A) Alpha cells of the pancreas B) Beta cells of the pancreas
C) Hepatocytes of the liver D) Goblet cells of the intestine

73. An example for a structures that is analogous in function and homologous in anatomy is

A) Statocysts of invertebrates and otoliths of vertebrates.
B) Wings of birds and bats.
C) Wings of insects and birds.
D) Wings of insects and bats.

74. The efficiency of sewage treatment using biological methods can be increased by

A) Chlorination B) Adding activated sludge
C) Providing anaerobic conditions D) Treatment with ozone

75. The patagium of the draco is an example for
A) Evolutionary link between birds and reptiles
B) Convergent evolution
C) Divergent evolution
D) Evolutionary link between birds and mammals

76. The characteristic feature(s) of the agouti gene which influences coat colour in rabbits is that
A) It codes for a peptide signalling molecule which functions as an inverse agonist.
B) It is lethal in all mammals when it is homozygous.
C) It influences coat colour by oxidising methionine.
D) Rufus modifiers are ineffective when the agouti gene is present.

77. A couple, in which the female partner was infertile, used the male partner's sperm and a donor's egg to produce a viable embryo by IVF. They contracted a surrogate mother to bear the concept to full term, but the gestational-surrogate mother refused to part with the child she delivered claiming that the child was her own impregnated by the natural father of the child. Which among the following will settle the issue?

A) Analysing the blood groups of the child, the surrogate mother and the actual (intended) parents.
B) Comparing the mitochondrial DNA of the child and the surrogate mother.
C) Comparing the DNA sequence of the father and the child.
D) Analysing the proteome of the surrogate mother and the intended parents.

78. An example for a disease caused by pleotropic genes is
A) Marfan syndrome
B) Edwards syndrome
C) Mosaicism
D) Cri-du-chat syndrome

79. In poriferans, the presence of a particular canal system makes it loose its radial symmetry. Which among the following is it?
A) Sycon type system
B) Ascon type system
C) Leuconoid type system
D) Rhagon type system

80. Swim bladders are absent in:
A) Heteropneustes fossilis
B) Anabas testudenius
C) All elasmobranchii
D) Latimeria chalumnae

81. Assertion: The occurrence of single sequence repeats (SSR) is lesser in gene regions
Reason: SSRs have extremely low mutation rates that preserves that integrity of genes which could compromise gene expression

A) The assertion is true, but the reason given is false and does not sustain the assertion.
B) Both the assertion and reason are true but are independent of each other.
C) The assertion is false but the reason is correct but does not sustain the assertion.
D) Both the assertion and the reason are false and contradict each other.

82. The corpus luteum
A) Produces FSH, prepares the uterus to accept the fertilised egg and sustains pregnancy.
B) Induces the formation of corona radiata and releases oxytocin which induces parturition.
C) Produces progesterone which acts on the lining of the womb, and halts the production of FSH
D) Degenerates once the pregnancy begins.

83. Which among the following is used as a biopesticide to kill larvae of insect pests?
A) Nuclear polyhedrosis virus, Bacillus thuringiensis, Raus sarcoma virus and myxoma virus.
B) Bacillus thuringiensis and Nuclear polyhedrosis virus.
C) Thermus aquaticus, Nuclear polyhedrosis virus and Bacillus thuringiensis
D) Agrobacterium tumefasciens and Nuclear polyhedrosis virus.

84. Statement 1. Cephalopods do not have a counter current system that assists in the exchange of gases through the ctenidia.
Statement 2. Cephalopods have branchial hearts which boost the flow of blood through the ctenidia, compensating for the lack of a counter current system.

A) Statement 1 is false, but statement 2 is true.
B) Statements 1 and 2 are true and statement 2 is a valid explanation for statement 1.
C) Both statements are false.
D) Statement 1 is true while statement 2 is false and contradicts statement 1.

85. Which among the following is a pest of green gram?
A) Sitophilus granaries
B) Cylas formicarius
C) Callosobruchus chinensis
D) Ephestia cautella

86. Which among the following is false?
A) Retrogressive metamorphosis is seen in Herdmania while metagenesis is seen in Aurelia.
B) Coprophagy is practised by Oryctolagus while evisceration is seen in Holothurians.
C) Diploid hymenopterans are females while haploids are males.
D) The larva of Urochordata is called Tornaria while that of Crustacea is called Nauplius.

87. In aquaculture, the maximum stocking density of a single species is achieved in:
A) Integrated farming practices
B) Traditional practices
C) Composite culture
D) Intensive culture

88. Which among the following is an insect pest of cashew?
A) Phytophthora palmivora
B) Corticium salmonicolor
C) Plocaederus ferrugineus
D) Helicotylenchus astriatus

89. Consider the following statements:
Statement 1: An example for convergent evolution is wings of insects and flying squirrel and that for divergent evolution is beaks of Darwin's finches.
Statement 2: Convergent evolution happens in organisms that are closely related while divergent evolution is observed in organisms that are not closely related.

A) Both statements are true
B) Statement 1 alone is true
C) Statement 2 alone is true
D) Both statements are false

90. The only animals of dinosaur lineage to survive the Cretaceous–Paleocene extinction event are:
A) Aves B) Reptiles C) Insects D) Pisces

91. The 9th vertebra of the frog is
A) Amphicoelus
B) Procoelus
C) Opisthocoelus
D) Biconvex

92. The active component in the commercially available hormone used to stimulate ovulation in fishes in aquaculture practices is:
A) Oxytocin B) hCG C) Estrogen D) GnRH

93. A person with Huntington's chorea
A) Is sterile.
B) Has an additional chromosome 18.
C) Looses control of motor activity and co-ordination.
D) Has an additional chromosome 12

94. The final acceptor of electrons in the electron transport chain is
A) Cytochrome p450
B) Hydrogen
C) Haem co-factor in complex IV
D) Oxygen

95. Which among the following is true?
A) Crossing over occurs only between autosomal chromosomes and not between sex chromosomes.
B) After crossing over, sister chromatids are not identical.
C) The expression of proteins in human oocytes is enhanced by lamp-brush chromosomes.
D) Genes that jump from one chromosome to another cannot be transcribed.

96. The Holliday model describes
A) D-loop replication
B) Recombination
C) Arrangement of fate maps
D) Lariat formation in RNA processing

97. Which among the following is not applicable to homeotic genes?
A) They encode proteins that bind to DNA
B) Identical genes regulate the development of anatomical structures in various organisms.
C) Their DNA sequence is least conserved among species.
D) Mutations in homeotic genes cause displaced body parts

98. Identify the correct match:

a.	Haemostasis	1.	Erythropoietin
b.	Uric acid	2.	Fatty acid metabolism
c.	Co-enzyme A	3.	Vitamin K
d.	Kidney	4.	Purine metabolism

A) a-4, b-3, c-2, d-1 B) a-3, b-4, c-2, d-1
C) a-3, b-2, c-4, d-1 D) a-1, b-4, c-2, d-3

99. The chemical bonding between two amino acids results in the elimination of
A) $COOH^-$ B) NH_3 C) H_2O D) OH^-

100. Identify the correct statement with reference to 'fossa ovale' in the human foetus
A) It is an anatomical feature seen in the foetal heart which by-passes the pulmonary circulation.
B) It inter-connects the ventricles of the foetal brain.
C) It is the closed region that replaces the foramen ovale of the foetal heart.
D) It is an abnormality which results in spina bifida.

101. Foul brood disease of honey bee is caused by
A) Bacteria B) Fungus C) Virus D) Nematodes

102. The oil in the oil-immersion objective of a light microscope
A) Increases the numerical aperture of the condenser lens.
B) Increases the numerical aperture of the objective lens.
C) It deflects and helps eliminate excess light reaching the objective lens.
D) It prevents the specimen from drying.

103. Consider the following:
Assertion: Defects of the immune system in a human child may not be evident till the end of the first year.
Reason 1. : The new born child has a very active and robust immune system which is able to resist all infections.
Reason 2. : Breast milk of the mother contains antibodies which are absorbed as such through the alimentary system of the child imparting immunity.

A) The assertion is true and the reason 1 explains the assertion.
B) The assertion is true and the reason 2 explains the assertion.
C) The assertion is false, but and the statement given as reason 1 is true.
D) The assertion is false, but and the statement given as reason 2 is true

104. Which among the following is/ are true?
A) Antibodies against blood group antigens are present at the time of birth.
B) Antibodies against blood group antigens are absent at the time of birth.
C) A child born to a mother with blood group A and father with blood group B cannot be born with blood group O.
D) In the human immune system, class switching occurs only in B-cells and not in T-cells

105. The lymphatic fluid is propelled by
A) Muscular activity.
B) Pumping action of the heart.
C) Peristaltic movements of the lymphatic vessels.
D) Hydrostatic pressure.

106. Which among the following is/ are true?
1. In both echinoderms and chordates, the skeletal structures are derived from the mesoderm.
2. While the segmentation of annulate animals is complete, that of chordates is limited to the dorsal myotomal region.
3. The flow of blood is dorsal to ventral in annelids and insects while it is ventral to dorsal in vertebrates.
4. The cleavage of the fertilised egg in chordates is radial and irregular while in annulates is spiral and regular.

A) 3 and 4 B) 2, 3 and 4 C) 1, 2, 3 and 4 D) 3 only

107. Consider the following statements:
Statement 1: In arthropods and molluscs regeneration of ATP is accomplished from phosphoarginine.
Statement 2: Chordates can generate phosphocreatine from glycine, sparing arginine needed for the synthesis of arginine-rich proteins.
Statement 3: Generating phosphocreatine from glycine spares arginine for the synthesis of arginine-rich proteins giving chordates an evolutionary advantage.

A) All statements are false.
B) Statement 1 is true while statements 2 and 3 are false.
C) All statements are true.
D) Statements 2 and 3 are true but statement 1 is false because ATP is regenerated only from AMP.

108. Which among the following defines embryonic development of an annelid?
A) Gastrulation by invagination, blastopore forms the mouth, coelom arising as an enterocoele, dipleurula-type larva
B) Gastrulation by immigration, blastopore forms the mouth, coelom formed as a schizocoele and trochophore-like larva.
C) Gastrulation by invagination, blastopore forms the anus, coelom arising as an enterocoele, doliolaria-type larva
D) Gastrulation by invagination, blastopore forms the anus, coelom arising as an enterocoele, trochophore-like larva.

109. The correlation between two variables is strongest and linear when
A) The value is 1 B) The value is less than 1
C) The value is more than 1 D) The value is zero

110. A characteristic feature of viruses that infect animals is that
   A) They are capable of penetrating the cell membrane using lytic enzymes they possess.
   B) They require a receptor complex for attachment which facilitates their entry.
   C) Since they do not have mitochondria, they depend only on glycolytic pathway to generate ATP when they are outside their host.
   D) Immediately after entering the host cell, the early genes are activated to produce capsid and envelope proteins.

111. Ethical practices on animal models require that the animals used in the study be euthanized after experimentation. The chemical(s) approved for euthanasia is:
   A) Potassium cyanide
   B) Methyl-iso-cyanate
   C) Combination of formaldehyde and gluteraldehyde
   D) Mixture of Sodium-barbiturate, KCl and Magnesium sulphate

112. In the event of alkalosis of human blood, one of the methods by which the body attains homeostasis is by
   A) Absorption of CO_2 through the lungs
   B) Stopping renal bi-carbonate excretion
   C) Reduce chloride content in the blood
   D) Increases aldosterone secretion

113. In sandwich ELISA:
   A) The antibody that captures the target antigen and the antibody that functions as the probe bind to the same epitope.
   B) The antibody that captures the target antigen and the antibody that functions as the probe bind to different epitopes of the same antigen.
   C) The antibody that captures the antigen belongs to the IgG class while the antibody that functions as the probe belongs to the IgM class.
   D) The enzyme that is linked to the antibody acts on the antigen which functions as the substrate.

114. Which among the following is/ are true with reference to Normal and Poisson distributions?
   1. In normal distribution the basic shape is always symmetric, while in a Poisson distribution it changes.
   2. A Poisson distribution is discrete while a normal distribution is continuous.
   3. A Poisson random variable is always >= 0.

   A) 1 alone is true B) 1 and 2 are true
   C) 2 and 3 are true D) 1, 2 and 3 are true

115. The ideal probe that can be used to detect a template after Northern blotting is
   A) Enzyme linked antibodies against the protein.
   B) A DNA template having the same sequence.
   C) An RNA template having a complementary sequence.
   D) A protein that is coded by the template.

116. The ideal temperature for invitro ligation using T4 DNA ligase is:
A) 37^0 C B) 42^0 C C) 16^0 C D) 72^0 C

117. The entity known as the guardian of the cell
A) Telomeres B) Cdks
C) p53 D) Tumor Necrosis Factor-α

118. In bioinformatics, FASTA format denotes
A) Tool for rapid alignment of DNA sequences.
B) Software that enables quick and fast submission of sequences to the database.
C) Text-based format for representing nucleotide or amino acid sequences using single-letter codes.
D) A standard file name extension to sequences submitted to NCBI.

119. The probes used in protein-microarray analyses are:
A) Monoclonal antibodies.
B) Enzyme-linked IgG antibodies.
C) Monoclonal antibodies conjugated with fluorescent dyes.
D) DNA templates that code for expressed proteins.

120. The primary function of B-complex vitamins is to function as:
A) Anti-oxidants B) Pigments
C) Co-enzymes D) Structural components

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