

CSIR JRF/NET Life Sciences December 2010

Paper I

Part A

1. Which is not a direct consequence of green house effect?

- a. Increase in sea level
- b. Rainfall
- c. Tsunami
- d. Global warming

- a. NaCl
- b. Iodine
- c. Bromine
- d. Fluorine

2. If a gas is released from pressurized bottle, the following statement is true for release gas?

- a. It will gain energy
- b. It will have same temperature as in bottle
- c. It will gain temperature
- d. It will cool as compare to gas in container

9. For a reaction $A \rightarrow B$, the rate of reaction can be represented as

$$\frac{dx}{dt} = K(a-x)$$

where a and (a-x) are concentration of reactants at time 0 and t. Then the unit of K will be

- a. $\text{Mol}^{-1}\text{L}^{-1}$
- b. $\text{Mol}^{-2}\text{L}^{-1}$
- c. $\text{L}\cdot\text{mol}^{-1}\cdot\text{s}^{-1}$
- d. Sec^{-1}

3. If a rectangle is inscribed in circle of diameter 'D'. Then the area of rectangle will be

- a. Independent of length and breadth
- b. Will be always smaller than $D^2/2$
- c. Will be always smaller than $D^2/4$
- d. Will be always greater than $\pi D^2/4$

10. At 35 °C ambient room temperature any liquid in two containers are allowed to cool from 100 °C to 70 °C and 80 to 50 °C respectively. If we compare rate cooling in we find that rate of cooling in latter will be

- a. Slow
- b. Fast
- c. Both at same rate
- d. Depends on container size

4. If period of $f(x)=\sin x$ is 2π , then the period of $g(x)=\sin(2x)$ will be

- a. π
- b. 2π
- c. $\pi/2$
- d. 4π

11. Which statement is not correct for all mammals?

- a. Absence of scales
- b. Absence of laying egg
- c. Absence of segmentation
- d. Presence of asexual reproduction

5. Let $f:[0, 1] \rightarrow (0, \infty)$ be a continuous function. Suppose $f(0) = 1$ and $f(1) = 7$. Then

- a. f is uniformly continuous and is not onto.
- b. f is increasing and $f([0, 1]) = [1, 7]$.
- c. f is not uniformly continuous.
- d. f is not bounded

12. The height of a tree is 10 m. 4m above the ground a nail is hammered. After ten years the tree grows to a height of 20 m. What is the height of the nail?

- a. 4 m
- b. 8 m
- c. 16 m
- d. 10 m

6. Zinc oxide is thermochromic, when heated, will change from white to yellow. This change in color is caused due to

- a. Stoichiometric property of metal
- b. Non-stoichiometric property of metal
- c. Burning of oxygen
- d. Fluorescence at high temperature

13. Highest biological oxygen demand in water bodies is due to

- a. Agricultural pesticide run off
- b. Organic matter
- c. Increased heterotrophs
- d. Increased inorganic matter

7. A wild form animal gives one egg and mutant form gives three egg per year respectively. If all parents and progenies survive, then what would be ratio of number of wild to mutant after four years.

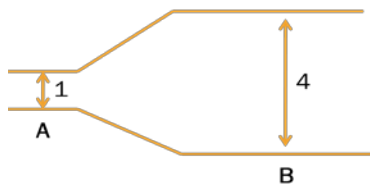
- a. 4
- b. 2×4
- c. $2 \times 3 \times 4$
- d. 24

14. If the handle of a door placed at hinges is displaced toward centre, more force is required to open it because

- a. Less moment of force
- b. More moment of force
- c. Force will be zero
- d. Centre of gravity is zero

8. The following is required for thyroxin production?

15. The liquid is flowing in tube as shown in diagram. The rate of flow at position A as compare to B will be



- a. four times
- b. Sixteen times
- c. Half
- d. One fourth

16. What amount required from 11 N HCl to make 50 ml 2N HCl

- a. 11 ml
- b. 9.09 ml
- c. 6.03 ml
- d. 2 ml

17. Temperature above which gas cannot be liquefied even by applying pressure is termed as

- a. Critical temperature
- b. Boyle temperature
- c. Curie temperature
- d. Charles temperature

18. Parts per billion can be represented as

- a. ng/Kg
- b. µg/Kg
- c. µl/l
- d. µg/g

19. It is predicted that due to global warming there would be rise in level of oceans. If radius of earth is R and rise in level of water is 'h', then the volume of water will be

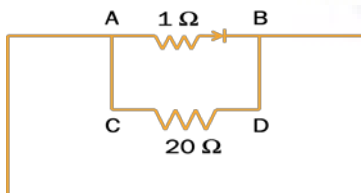
- a. $\pi r^2 h$
- b. $\frac{3}{4} \pi r^2 h$
- c. $2 \pi r^2 h$
- d. $\frac{4}{3} \pi r^2 h$

20. The correct configuration of following structure



- a. L configuration
- b. D/L configuration
- c. R configuration
- d. S configuration

21. In given circuit voltage drop at diode is 0.9 V. Then which statement is correct



- a. More current is flowing through path AB
- b. More current is flowing through path CD
- c. Equal current is flowing from both routes
- d. Resistance is not influencing flow of current

22. Cell with large round size has more chance to survive as compare to thin cell under desiccation because of

- a. Low surface to volume ratio
- b. High surface to volume ratio
- c. Thin membrane
- d. Thick membrane

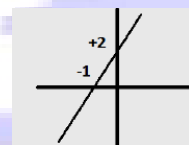
23. Pumice, is a name of the most common volcanic rock that floats. It has various air bubbles and capillaries which trap air. Which statement is correct for this rock

- a. Air cavities interconnected
- b. Air cavities not connected
- c. Density of rock is more than water
- d. Rock is very older

24. NaCl has ionic bond because

- a. Both Na and Cl has same number of valence electron
- b. Both Na and Cl belongs to same group
- c. Na looses one electron and chlorine receive one electron
- d. Due to difference in their electro negativity

25. Slope of line in given plot will be



- a. -1
- b. -1/2
- c. +1/2
- d. 2

26. Which of the following is not possible in biological systems?

- a. DNA → RNA → Protein
- b. Protein → RNA → DNA
- c. Glucose → amino acid → Protein
- d. RNA → DNA → Protein

27. An aero plane flies with a ground speed of 800 km/h and velocity of wind is constant 50 km/h. If this aero plane flies 1 hour upstream and 1 hour downstream of wind. Then total distance covered and average speed will be

- a. 1600 km and 800 km/h
- b. 1650 km and 825 km/h
- c. 1550 km and 775 km/h
- d. 1700 km and 850 km/h

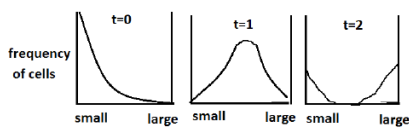
28. Brown ring test is confirmatory test for

- a. Nitrate
- b. Bromide
- c. Chloride
- d. Fluoride

29. The following is responsible for ozone hole?

- a. CO₂
- b. CH₄
- c. Chlorine
- d. NO

30. The graph below shows frequency distribution of different cell sizes during different stages of cell culture. From this pattern of growth we can draw conclusion that

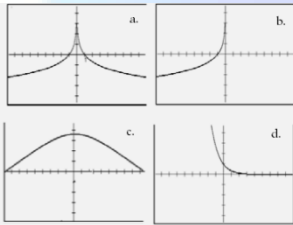


- a. Most of the cells divide at same time
- b. Rate of cell division is constant
- c. Cell does not divide
- d. All the cell divides at same time

31. Earth is active planet with phenomenon like volcano, earthquake and continental drift. The major source of energy for continental drift is

- a. Moon gravity
- b. Earth gravity
- c. Radioactivity in core of earth
- d. Energy from sun

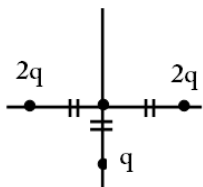
32. Identify the graph of the logarithmic function $f(x) = xe^x$



33. The mean salinity of sea 35 g per liter. The main cause of this

- a. Evaporation and rainfall
- b. Photosynthesis
- c. Crust erosion and surface run off
- d. Rivers drainage

34. The net direction of force on charge placed at origin as shown in diagram will be in



- a. +Y b. -Y

- c. +X d. -X

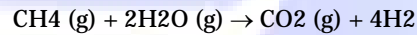
35. The following divide by binary fission

- a. Muscle cell
- b. Nerve cell
- c. RBC
- d. Bone marrow cell

36. Smog is due to

- a. smoke and other air pollutants
- b. More moisture in environment
- c. Increase in CO₂
- d. Low temperature of earth surface

37. If standard enthalpies of formation for H₂O (g) - 242, CH₄ (g) -75 and CO₂ (g) is -111 KJ mol⁻¹ respectively. Determine the heat of reaction of the following reaction:



- a. - 206 KJ mol⁻¹
- b. +206 KJ mol⁻¹
- c. - 670 KJ mol⁻¹
- d. - 745 KJ mol⁻¹

38. The computer codes for decimal number 99 will be

- a. 110011
- b. 1110111
- c. 100011
- d. 01100111

39. Lassaigne's test is used detect the presence of N, S, halogens, and P in an organic compound. These elements are present in the covalent form in an organic compound. On treatment with sodium metal, the covalent carbon of organic compound is converted into which ionic form

- a. Cyanide
- b. Sulfide
- c. Nitrate
- d. Carbide

40. If a certain place shows stable population distribution in all age groups, it means maximum number of individual will be

- a. Healthy
- b. Youngest
- c. Oldest
- d. Reproductively more active

Part B

1. Which is true for amount of yolk and cleavage in egg of amphibian?
 - a. Mesolecithal and holoblastic cleavage
 - b. Isolecithal and holoblastic cleavage
 - c. Mesolecithal and meroblastic cleavage
 - d. Microlecithal and meroblastic cleavage

2. Treatment of acetosyringone is given during transfer of transgene using Agrobacterium as vector. The rationale behind this is that acetosyringone
 - a. Helps in anchorage of bacteria to plant cell wall
 - b. Activates vir operon of bacteria
 - c. Helps in integration of T-DNA in plant genome
 - d. Promotes bacterial growth by activating genes in plant

3. To assess the mutation in bacteria, bacteria were inoculated in various aliquots and later on shifted on screening media for selection of mutants. The most important information for assessing mutation would be
 - a. Total number of mutants
 - b. Average number of mutants per aliquot
 - c. Petri plates with single mutants colony
 - d. Petri plates without any mutants colony

4. FSH Receptors present on
 - a. Leydig cells
 - b. Sertoli cells
 - c. Peritubular cells
 - d. Spermatogonium germ cells

5. Mammalian jaw has evolved from
 - a. Pharyngeal arches
 - b. Temporal bone
 - c. Frontal bone
 - d. Dentary and squamosal bones

6. The major environmental cue for migration of birds during winter?
 - a. Duration of day length
 - b. Instinct
 - c. Falling temperature
 - d. Learning

7. Which statement is correct regarding ABC transporters?
 - a. Consist of the transmembrane domain as well as the nucleotide-binding domain
 - b. All are P glycoproteins
 - c. Present in only eukaryotes
 - d. Makes membrane porous

8. Ants and bees social structure include queen, sterile female workers and soldier drones. This is best example of
 - a. Eusociality
 - b. Sub-social
 - c. Group selection
 - d. Altruism

9. Which of the following signaling pathway is activated by the binding of erythropoietin (EPO)
 - a. JAK-STAT
 - b. Nf-KB
 - c. Ras/raf
 - d. Smad pathway

10. Plasmid copy number achieved by plasmid encoded control elements that regulate the initiation of the replication step. For example in stringent plasmid protein Rep A dimerize and binds to origin of replication and do not allow replication more than once. What mutation may convert this stringent mode of replication in plasmid into relaxed one?
 - a. Over expression in repA protein
 - b. Mutation in repB gene in dimerization domain
 - c. Mutation in repA other than dimerization domain
 - d. Gain of function in recognition domain of repA

11. Neuropeptides and neurotransmitters are molecules secreted by neuron. Which statement is correct statement about neuropeptide as compare to neurotransmitter?
 - a. Less potent and short acting
 - b. More potent but short acting
 - c. Less potent but long acting
 - d. More potent and longer acting

12. Under certain conditions pyruvate can be allowed to decarboxylate into acetyl CoA and CO₂. For evolution of ¹⁴C labeled carbon in CO₂, which carbon atom must be radiolabelled in glucose prior to glycolysis?
 - a. C1 or C6
 - b. C2 or C3
 - c. C3 or C4
 - d. C5 or C2

13. Chromophore associated with phytochrome of plants is
 - a. Phycobillin
 - b. β-carotene
 - c. Pterin
 - d. FAD

14. In scanning Simple Sequence Repeats (SSR) primers are used against
 - a. Random sequence
 - b. Repetitive sequence
 - c. Flanking region of repetitive sequence
 - d. Conserved region of exon of gene

15. Not a structural alignment tool?
 - a. SSAP
 - b. TM-Align
 - c. T-coffee
 - d. DALI

16. The following activity is termed as DNA polymerase proof reading activity?
 - a. 5'→3' polymerase activity
 - b. 3'→5' polymerase activity

- c. 5'→3' exonuclease activity
- d. 3'→5' exonuclease activity

17. Male parental care is expected to observed during

- a. Polygynous species
- b. Small population size
- c. Life long bond pairing
- d. Reverse sexual dimorphism

18. If all four gametes AB, aB, Ab and ab are formed in equal probability. Then arrangement of chromosomes at metaphase-I of meiosis will be



19. The following cycle used in hetero lactic fermentation?

- a. Entner–Doudoroff pathway
- b. Phosphoketolase Pathway
- c. Pentose Phosphate Pathway
- d. Glycolate pathway

20. The distance between gene A and B is 10 cM. If a genotype $\frac{A \quad b}{a \quad B}$ is selfed, the percentage of progeny with genotype aabb will be

- a. 10 %
- b. 25 %
- c. 0.25 %
- d. 0.01 %

21. The following is most unstable condition in protein folding?

- a. Non-polar side chain exposed to outside
- b. Polar side chain present in core of protein
- c. Non polar side chains in core of protein
- d. Polar amino acids exposed to outside

22. Tetracycline antibiotics inhibit protein synthesis and exhibit their effect by binding to

- a. 30S subunit of ribosome
- b. 50S subunit of ribosome
- c. A site of ribosome
- d. Peptidyl transferase

23. A bottle with 2 ml of ^{14}C labeled phenyl alanine shows 1m Ci radioactivity. The specific activity of isotope is 200 Ci/mMol. The concentration of phenyl alanine in bottle is

- a. $200 \times 10^{-3} \text{ M}$
- b. $400 \times 10^3 \text{ M}$
- c. $100 \times 10^{-3} \text{ M}$
- d. $2.5 \times 10^{-3} \text{ M}$

24. The characteristic feature of mitochondrial genome is?

- a. Intron less DNA
- b. Repetitive DNA
- c. Polycistronic RNA

d. Satellite DNA

25. What would be effect on serum concentration of TSH if a bolus of thyroxine is injected to a person?

- a. Remain unchanged
- b. First increase and then come to normal
- c. Initially decrease but after short time will be normal
- d. Remain high for prolonged period of time

26. Which would be the result of mutation in genes responsible for radial patterning in roots of higher plants?

- a. No apical root formation
- b. Root hair will fail to develop
- c. Variation in number and position of cell in vascular system
- d. Roots will be positively geotropic

27. In *Arabidopsis* gene responsible for formation shoot meristem is

- a. Leafy
- b. Agamous
- c. Clavata
- d. Wus

28. In home air conditioner, the major radioactive indoor air pollutant?

- a. Cs
- b. U
- c. Sr
- d. Rn

29. The following is the first step in translational proof reading?

- a. Aminoacylation of t-RNA by amino acyl t-RNA synthetase
- b. Peptide bond formation
- c. Entry into A site
- d. Formation of amino acyl-t-RNA, 40 S ribosome and m-RNA ternary complex

30. Among the following which gene product migrates from leaves to shoot meristem during transition of shoot meristem into floral meristem?

- a. Flowering locus T
- b. Flowering locus D
- c. Leafy
- d. Apetala

31. There is small gap between two neuron at synapses. The purpose of gap is

- a. Unidirectional flow of information
- b. Reabsorption of neurotransmitter
- c. Coupling of charge over membrane
- d. Slow down speed of propagation

32. Puromycin blocks translation and its mode of action is

- a. binds to A site and stop elongation
- b. stops peptidyl transferase activity
- c. Binds EF-TU-GTP and prevent initiation
- d. do not allow termination of translation

33. Which GLUT gene helps in transport of glucose in to cells?

- a. GLUT1

- b. GLUT2
c. GLUT4
d. GLUT 5

34. The following enzyme uses NAD as cofactor?

- a. Histone acetyl transferase
b. Histone methyl transferase
c. Histone deacetylase
d. Histone demethylase

35. Most abundant element in plant cells

- a. Sodium
b. Calcium
c. Potassium
d. Zinc

36. Which of the following is produced in phenyl propanoid pathway?

- a. Phenolics b. Carotenes
c. Alkaloids d. Terpenes

37. Techniques used to assess HIV-I seroconversion are

- a. immunoblot and ELISA
b. Immuno precipitation and PCR
c. PCR and Immunofluorescence
d. PCR and ELISA

38. Most effective protein denaturant form of Guanidinium when used in equimolar concentration is

- a. Iodide
b. Chloride
c. Bromide
d. Sulphate

39. In statistical error Type-I is represented by α and Type II by β . Then measure of power of error will be

- a. $1-\alpha$
b. $1-\beta$
c. $\alpha-\beta$
d. $\beta-\alpha$

40. Largest reservoir of carbon is

- a. Atmosphere
b. Ocean sediments
c. terrestrial organic matter
d. Inorganic carbon in earth mantle

41. The following system can be utilized for glycosylation of peptides expressed using recombinant DNA technology?

- a. Large bacterial fermenters
b. Small bacterial fermentors
c. Normal bacterial bioreactors
d. Mammalian Cell line

42. T_m of DNA does not depends on

- a. Length of DNA
b. % GC content
c. Presence of cations
d. Presence of anions

43. The methyl viologens, commonly used herbicides, which interfere photosynthesis of higher plants. They are responsible for

- a. Evolution of more oxygen
b. Dissipation of proton gradient across thylakoid membrane
c. Inhibition of flow of electron from PS II to PSI
d. Transfer of electrons from PS I to molecular oxygen

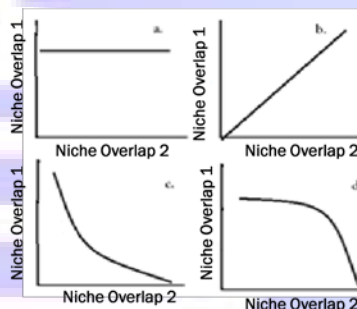
44. Allele frequency of a particular allele was found to be 0.6 in three different populations. It is probably due to is

- a. Neutral allele
b. Stable polymorphism
c. Heterozygote advantage
d. Natural selection

45. Which statement is not correct for blood?

- a. Mature RBC is of larger size as compare to its precursor cells
b. Platelets play important role in blood clotting
c. WBC acts as phagocytotic cells
d. neutrophils are more number than basophils

46. Which of the following diagram correctly represents co-existence of two species even during niche overlapping?



47. When a person enters a dark room from bright sunlight he cannot see anything for a few seconds, because

- a. Rhodopsin pigment is cleaved
b. Scotopsin proteins of rods are denatured
c. All Rhodopsin are bound with protein
d. All Sctopsin becomes non-functional

48. The introduced transgene integrity in mouse can be validated by

- a. Male pronuclei insertion
b. Fusion of enucleated egg with somatic cells
c. Transfer into competent embryogenic cell
d. Southern blot analysis

49. The position of collagen triple helix in Ramachandran plot is at

- a. Top Left
b. Top right
c. Bottom right
d. Bottom left

50. At any place if more diversity and variation is observed in any species of domestic animal, then it can be concluded that

- a. Place is natural centre of origin of that species
b. Animal has been introduced once and is invasive
c. Animal has been introduced more than once

d. People take more care of animals

51. During the early origin of earth oxygen was absent in environment. Later on the oxygen increased and reached to present level. The main source of oxygen was

- a. Photosynthesis
- b. Released from CaCO₃
- c. Escape of CO₂ to environment
- d. Escape of oxygen from internal sources

52. During male gametogenesis, primary spermatocytes are formed

- a. Before meiosis-I
- b. After meiosis-I
- c. After meiosis-II
- d. Mature sperms

53. Somatic hypermutation in immunoglobulin genes is responsible for

- a. Class switching
- b. Affinity maturation
- c. Clonal selection
- d. VDJ Recombination

54. Which of the following is caused due to transformation by retroviruses?

- a. Adult T-Cell leukemia
- b. Burkitt Lymphoma
- c. Colon cancer
- d. Oral Epithelial Cancer

55. The major force responsible for antigen antibody interaction is

- a. Hydrogen bond
- b. Vander wall interaction
- c. Disulphide bond
- d. Peptide bond

56. S-adenosyl methionine is a precursor of which plant hormone?

- a. Abscisic acid
- b. Auxin
- c. Ethylene
- d. Cytokinin

57. Ciprofloxacin is a synthetic chemotherapeutic antibiotic of the fluoroquinolone drug class. The main target of antibiotic ciprofloxacin is

- a. Replication
- b. Protein synthesis
- c. Cell wall synthesis
- d. Membrane structure

58. Which of the following statement correctly refer statistical parameter mode?

- a. Most of insects mature on third day of development
- b. Major part of population fails to advance their education above 10+b.
- c. The average number of seeds by plant is c.5
- d. The height of plant ranges from 5 to 10 m

59. Among the following which is typical tree of Indian desert ecosystem?

- a. *Prosopis cineraria*
- b. *Avicennia officinalis*
- c. *Mangifera indica*
- d. *Acer negundo*

60. The amino acid, proline precursor is

- a. Pyruvate
- b. 3-Phosphoglycerate
- c. Oxalo acetate
- d. α -keto glutarate

61. One of the most important gene, involved in dorsal– ventral axis determination in *Drosophila* is *dorsal*. It codes Dorsal protein which

- a. is taken up into the nuclei of cells and this side will become the ventral side
- b. remains in the cytoplasm of cell and this side will become ventral side.
- c. is taken up into the nuclei of cells and this side will become the dorsal side.
- d. degraded in one side and that will become dorsal side

62. The most favorable for maximum sustainable harvesting of resources?

- a. Major part of population is near or around the carrying capacity
- b. Population is half of the carrying capacity
- c. Population is one fourth below the carrying capacity
- d. Population has slow doubling time

63. The true statement about progenitor cells?

- a. They are same as stem cells
- b. They are totipotent cells
- c. They can divide but do not remain differentiated as stem cells
- d. They cannot divide

64. Optimum temperature for growth of extremophiles is

- a. 0 °C
- b. 20 °C
- c. 50 °C
- d. Over 80 °C

65. Molecular evolution do not reflects

- a. Species divergence
- b. Convergent evolution
- c. Natural selection
- d. Neutral mutation

66. The causative organism for blast of rice is

- a. *Pyricularia grisea*
- b. *Ustilago tritici*
- c. *Erwinia chrysanthemi*
- d. *Cercospora janseana*

67. The Carboxy-Terminal domain (CTD) of RNA polymerase II consists of heptapeptide repeats (YSPTSPS). Other proteins often bind the C-terminal domain of RNA polymerase in order to activate polymerase activity. Which of the following is not associated with CTD of RNA polymerase function?

- a. Promoter recognition
- b. Promoter clearance
- c. 5'-Capping
- d. Splicing

68. In a heterozygous two recessive mutation at different site will give mutant phenotype when genes involved are

- a. Allelic and placed in cis
- b. Allelic and placed in trans
- c. Non-allelic and placed in cis
- d. Non-allelic and placed in trans

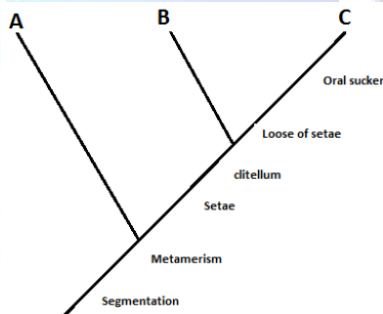
69. Characteristic feature of Cnidaria is

- a. No tissue or organ system
- b. Diploblastic or bilayered
- c. Triploblastic or three layered
- d. Segmentation

70. The following which is not responsible for producing near UV signal in circular dichroism for secondary structure determination of proteins?

- a. Tyrosine
- b. Tryptophan
- c. Disulphide bond
- d. Peptide bond

71. Following cladogram represent changes in annelids during evolution. The group 'C' in cladogram represents



- a. Hirudinea
- b. Echiura
- c. Polychaetes
- d. Oligochaeta

72. Which of the following acts as a osmoprotectant in plants?

- a. Proline
- b. Tryptophan
- c. Glycine
- d. Levulinic acid

73. Catalytic activity of RNA in splicosome is through?

- a. U1 and U5
- b. Intron branch point, U2 and U6
- c. Intron branch point, U4 and U6
- d. U2 and U4

74. Na⁺-K⁺ pump operates under intracellular concentration of

- a. High Na and low K
- b. High Na and High K

- c. Low Na and low K
- d. Low Na and high K

75. Major reason for evolution for diversity in immune system is

- a. Natural selection
- b. Neutral mutations
- c. Directed evolution
- d. Co-evolution

76. Under what thermodynamically condition reaction would be spontaneous?

- a. $\Delta H > 0$ and $\Delta S > 0$
- b. $\Delta H < 0$ and $\Delta S > 0$
- c. $\Delta H < 0$ and $\Delta S < 0$
- d. $\Delta H > T \Delta S$

77. The general procedure for estimation of primary production is the "light" and "dark" bottles method. In an experiment two bottles containing 200 mg/l of O₂ was incubated in light and dark for seven days. The amount of O₂ estimated after incubation period was found to be 600 mg/l and 100 mg/l in light and dark respectively. The net primary production during incubation period is.

- a. 400 mg/l
- b. 100 mg/l
- c. 500 mg/l
- d. 600 mg/l

78. The organelle of C₃ plants, where glyoxylate is formed is

- a. Chloroplast
- b. Peroxisome
- c. Mitochondria
- d. Cytosol

79. Which of the following small G-protein is involved in nuclear transport and targeting?

- a. Ras
- b. Ran
- c. Rab
- d. Rho

80. The following is not a characteristic of climax community?

- a. Wide niche
- b. Complex food web
- c. Low resilience
- d. Inter-biotic nutrients dependence

81. In an abandoned area first nitrogen fixing communities arrives and carry out nitrogen fixation, later on this community is replaced by non-nitrogen fixing species. In the mechanism of succession this is in general agreement according to

- a. Facilitation
- b. Tolerance
- c. Inhibition
- d. Adaptation

82. Which of the following is not a characteristic feature of Apoptosis?

- a. Swelling of cell
- b. Nuclear fragmentation
- c. Change in cell wall porosity

d. Permeability of mitochondrial inner membrane

83. In an organism if number of linkage group is 12 then, number of haploid set of chromosome is

- a. 12
- b. 6
- c. 24
- d. 4

84. Which eukaryotic RNA polymerase transcribes t- RNA genes?

- a. RNA polymerase I
- b. RNA polymerase II
- c. RNA polymerase III
- d. DNA polymerase I

85. β - α - β structure in protein structure are known for

- a. ligand binding
- b. stereological hindrance in binding of ligand
- c. Catalytic centre
- d. transmembrane domain

86. Substrate for DNA synthesis is?

- a. Nucleotide tri phosphate
- b. Nucleoside tri phosphate
- c. Nucleoside pyrophosphate
- d. Ribonucleotide tri phosphate

87. In a certain genetic cross, 1/16 proportion of progeny shows mutant phenotype. It means

- a. Two independent assorting genes are involved for trait
- b. Two independently assorting duplicate genes are involved
- c. Two linked genes are involved for trait
- d. Two independent segregating alleles are responsible for trait

88. Variation in two characters in two or more species can be best represented by

- a. Histogram
- b. Scattered diagram
- c. Triangular box
- d. Linear curve

89. In prokaryotes during replication, the lagging strand is synthesized in a series of short fragments known as Okazaki fragments, consequently requiring many primers. The RNA primers of Okazaki fragments are subsequently degraded by DNA Polymerase I and the gap are filled. How DNA polymerase I fills the gap once the primer have been removed from lagging strand?

- a. DNA polymerase I has its own primer
- b. DNA polymerase I do not require primer
- c. DNA from leading stand serves as primer
- d. Ends of existing Okazaki fragments on lagging stand serves as primer

90. Which statement is correct for membrane receptors for signal transduction?

- a. Contain single or multiple membranes spanning domain
- b. Always coupled with trimeric G protein
- c. Always results in production of secondary messenger
- d. Recognized non-polar signaling molecules

91. Which group of algae is believed to be most closely related to higher plants?

- a. Charophyceae
- b. Chlorophyceae
- c. Rhodophyceae
- d. Pheophyceae

92. Which statement is correct in relation of activity of telomerase?

- a. Increase with age
- b. Observed in all cancers and responsible for immortality
- c. Responsible for apoptosis but not for ageing
- d. Re-synthesize telomeres

93. An insertion of single nucleotide in coding region of gene leads to frameshift mutation and result is formation of non functional protein. Under certain condition second suppressor mutation in another gene may result into formation of functional protein. How suppressor mutation can do this

- a. There is insertional mutation in gene of t-RNA anticodon such that it is able to interact with four nucleotide codon
- b. Mutation in gene of ribosome leading to frameshift over transcript
- c. Mutation in gene whose product bulge out extra nucleotide
- d. Another mutation reverses the original insertion

94. The following is not an invasive plant species in India?

- a. *Parthenium hysterophorus*
- b. *Salvinia molesta*
- c. *Lantana camara*
- d. *Myristica fida*

95. Which is common cytokine secreted by both TH1 and TH2 cells

- a. IL-3
- b. IL-4
- c. INF- γ
- d. IL-5

96. Spontaneity of mutation means

- a. Mutation in absence of exogenous mutagen
- b. Mutation directly proportion to presence of mutagen
- c. Mutation inversely proportion to presence of mutagen
- d. Mutation at in appropriate time

97. Frog A has length "l" and weight "w". Another frog "B" has double length and four times weight. It means

- a. Frog A is more cylindrical
- b. Frog B is more cylindrical
- c. Frog A has low surface to volume ratio
- d. Frog B is overweight

98. MHC I is present at

- a. All nucleated cells
- b. Only on antigen presenting cells
- c. Only on B and T lymphocytes
- d. Macrophages and Dendritic cells

99. Nilgiri Tahr is restricted only to upper heights (1,200 to 2,600 metres) of western ghat. The major reason is

- a. Habitat preferences
- b. Habitat shrinkage
- c. Urbanization in other part of habitat
- d. Pressure of tiger predation at lower height

100. Which cyclin is involved the formation of pre transcriptional enhancer binding protein (PTEB)?

- a. Cyclin D
- b. Cyclin K
- c. Cyclin E
- d. Cyclin T

Answers

Part-A

1c 2d 3c 4d 5c 6b 7d 8b 9d 10a 11d 12a 13b 14a 15a 16b 17a 18a 19 20d 21a 22d 23a 24c 25d 26b 27a 28a 29d 30a 31a 32a 33c 34a 35d 36a 37c 38a 39a 40d

Part-B

1a 2b 3b 4b 5d 6a 7a 8a 9a 10b 11d 12c 13a 14c 15c 16d 17d 18a 19b 20c 21a 22a 23d 24a 25c 26c 27c 28d 29b 30a 31a 32a 33b 34c 35c 36a 37b 38b 39b 40b 41d 42d 43d 44c 45a 46b 47a 48d 49a 50b 51a 52a 53b 54a 55a 56c 57a 58a 59a 60d 61a 62a 63c 64d 65c 66a 67a 68b 69a 70d 71a 72a 73b 74d 75a 76b 77a 78b 79b 80a 81a 82a 83a 84c 85a 86b 87a 88a 89d 90a 91a 92b 93a 94d 95a 96a 97a 98a 99a 100b

Thank to

Nagaraju, Raj, Arun Kumar, Akakanksha, Parveen Sony, Raman Jeet, Brijesh, Pardha Saradhi, Sahabjada Siddiqui, Prachi Sharma, Pragyan Priyam, Khyati Sharma, Rantidev Shukla, Chidambareswaren, Nandhini Bhashini, Rameswar, Krishna Jain, Gopal kundukuri, Raghu Kurukoti, IFAS, Nanda, Nagulu Edule, Pradeep K, Suri Memi, Krishnarjun, Gaurav Singh and Venkatesh Kommagani.