MEMORY BASED CSIR NET LIFESCIENCES PAPER JUNE - 2008 DEVELOPED BY

HELIX ACADEMY

(An Academy of Unmatched Excellence for CSIR-UGC (JRF) NET/GATE/ICMR/JNU/IISc/BARC/JAM & IAS/IFS)

1. Electron microscope have comparatively better resolution as compare to light microscope because
   1. They are costly
   2. Uses more lenses
   3. Carred out in vacuum
   4. Wavelength used is lesser then visible light

2. Consider the following algorithm

```
n > 0
 f (n)
if n=0
        the return 0
else 2 + f(n - 2)
```

consider the initial value of n=11, then the value returned after execution of program will be
   1. 9 2. 11
   3. 13 4. program will no terminate

3. Consider the following table, where . = AND, + = OR, X=NOT X and Y = NOT Y

X	Y	F(x, y)
T	T	T
T	F	F
F	T	F
F	F	T

Value of F(x,y) will be
   1. X, Y 2. X+Y
   3. X.Y+X. Y 4. X. Y+X. Y

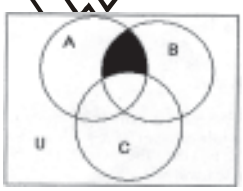
4. Consider the equation; the second equation will be equal to

$$1+\frac{1}{2^2}+\frac{1}{3^2}+\frac{1}{4^2}+\ldots\frac{1}{n^2}=\pi^2/6$$

$$1+\frac{1}{3^2}+\frac{1}{5^2}+\frac{1}{7^2}+\ldots\frac{1}{(2n-1)^2}=$$

   1. Ð/2 2. $Ð^2/12$
   3. $Ð^2/6$ 4. $Ð^2/2Ð - 1$

5. Consider the following vein diagram for universal set U.



   1. AoBoC 2. AoBoC^o
   3. AoB 4. A^C0B^C0C

6. Consider a series is I certain geometrical progression with exact different 'd' between successive number. If series starts with 10 and consist 100 integers. Their sum can be represented by the equation.
   1. 100 (100+99d) 2. 100(90+100d)
   3. 20 (50+99d) 4. 50 (20+99d)

7. It is expected that around 2100 AD all ice in polar glaciers will melt and level of sea will increase as a consequence of global warming. What would be effect of it on rotation speed of earth?
   1. Increase 2. Decrease
   3. No Change 4. Stop

8. If a bar magnet is allowed to fall through solenoid connected to the closed circuit. Its acceleration will be
   1. Equal to g 2. Greater than g
   3. smaller than g 4. It will not fall

9. Mumbai and Chennai are more humid cities as compare to Delhi because they are
   1. Near to tropics 2. Near to equator
   3. Coastal cities 4. Lies in low pressure

10. If accelerated charged particle with similar velocity field which is perpendicular to their direction. Ti was observed that all have same radius of curvature. Thus we can conclude that
    1. They have same mass
    2. Have same mass; charge ration
    3. Mass is directly proportional to square of charge
    4. Charge is directly proportional to square of mass.

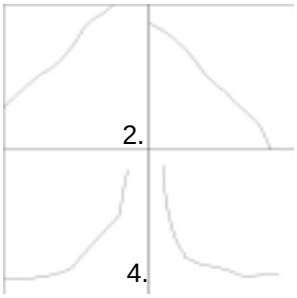
11. Among the following which process do not occur in nucleus
    1. Replication 2. Transcription
    3. Translation 4. Repair

12. If a ball of mass 'm' was dropped from certain height 'h'. The distance covered by it after 2 sec will be (g=9.8 ms^{-2})
    1. 4.9m 2. 9.8m
    3. 19.6m 4. 28m

13. Elevation level altitude (ELA) for a glacier is constant height when deposition of ice at top is equal to melting of ice from its base. It is estimated that height of Himalayan glaciers has reduced 500 m since ice age, considering that temperature change per km rise in height is 6^0C. The global temperature during ice age as compare to present was
    1. 6^0 higher 2. 3^0 higher
    3. 6^0 lower 4. 3^0 lower

14. At present half life of C^{14} is 5730 years. Its half life 11460 years ago was
    1. 5730 2. 11460
    3. 2680 4. 1680

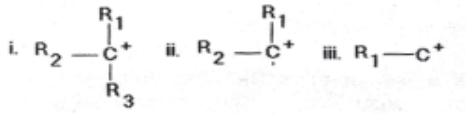
15. Among the following which graph correctly represent the growth rate in year considering that it bud once in life



16. It is observed that tail of revolving comet is always directed away from sun. The probable reason is
    1. Due to gravitational pull of Saturn and Jupiter
    2. Due to repulsive force from sun
    3. Due to high speed
    4. Due to lesser evaporation at sunlit side

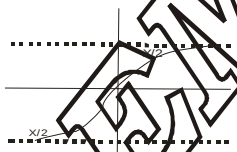
17. Consider the following statements, where, :=stands for implies to
    x:=x+y
    y:=x-y
    x:=x-y
    if x=2 and y=3, then out put (x,y) will be
    1. 3, 2 2. 1, 1
    3. 2, 3 4. 5,3

18. The order of stability in given structures would be



    1. i>ii>iii 2. i<ii<iii
    3. ii>iii>I 4.i>iii>ii

19. The following curve represents



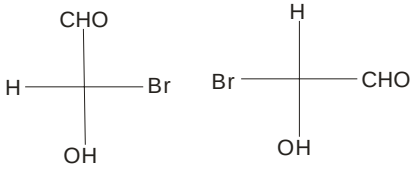
    1. $\tan^{-1} x$ 2. $\sin^{-1} x$
    3. $\cos^{-1} x$ 4. $\cosin^{-1} x$

20. Consider the following 4x4 matrix table

0	1	0	1
2	3	1	3
0	0	0	1
A	3	0	3

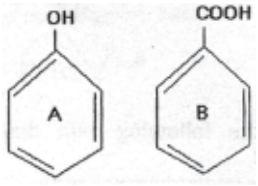
    1. invertible if a=0
    2. non-invertible if a=0
    3. invertible if 0<a<1
    4. non-invertible if 0<a<1

21. The pair of structure are



    1. Identical 2. Enantiomers
    3. Distereisomers 4. Epimers

22.



1. A is more acidic than B
2. B is more acidic than A
3. Both are equal acidic
4. A is not acidic at all

23. Two first order reaction convert substrate A into C via B. The rate constant for A B is 1/min and for B C is 1/hr. The over all rate of reaction from A to C will be
1. 1/min 2. 1/hr
3.2/hr 4. 2/min

24. The light falling on oil is split into several colors due to phenomenon of
1. Dispersion 2. Refraction
3. Diffraction 4. Interference

25. Possible combination of gametes which can be formed by genotype AaBbCcDdEeFfGg are
1. 16 2. 32
3. 64 4. 128

26. $f(x)=3^x$, such that $f(x)=1$, then value of x will be
1. 0 2. 1
3. 3 4. 1/3

27. For an equation, the sum of root will be
$x^5+15x^4+10x^3+5x^2+1=0$
1. 10 2. 15
3. -10 4. -15

28. According to Chares law a real gas at 1 atm pressure and temperature 't' was kept at absolute 0 degree. Its volume at this temperature will be
1. 0 2. 1
3. V/273 4. V/273+t

29. Volume of a person of 50 kg will be
1. 50 ml 2. 500 ml
3. 5 lit 4. 50 lit

30. Which statement is correct regarding the meiosis
1. There is two round of replication and two round of cell division
2. There is one round of replication and one round of cell division
3. There is one round of replication and two round of cell division
4. There is two round of replication and one round of cell division

31. Which of the following monochromatic lights are more suitable for growth and development of plants
1. Red, far red 2. Red, Blue
3. Red, green 4. Blue, far red

32. Consider the following DNA sequence 5'-ATGGGCATAGACGATATGGTAG-3'. If due to frame shift mutation there is insertion of G between 3rd and 4th position. Consider a reverse mutation occur in same mutated sequence. Which reverse mutation will have minimum effect in protein change
1. Insertion of nucleotide between 5th and 6th position
2. Insertion of three nucleotide between 5th and 6th position
3. Deletion of a nucleotide between 5th and 6th position
4. Deletion of a nucleotide between 11th and 12th position

33. A trphophan auxthoph in corn in corn showed 50 times more accumulation of IAA then the normal. Probable explanation for this
1. There may be some other precursor for IAA synthesis
2. IAA is probably not inhibited by feed back mechanism
3. IAA was not oxidized
4. Deconjugation of ester linked IAA does not take place

34. Pitcher plant *Nepenthes alata* would be expected to have
1. NO_3-specific channel
2. H^+-$N0_3$ symporters
3. peptide tranporter
4. ATP powered pumps for NO_3-

35. With time molecular distance between organisms increase during evolution due to
1. Natural selection 2. Neutral mutation
3. Random drift 4. Point Mutations

36. During Gametophytic self incompatibility the primary response is
1. Deposition of callose
2. Pollen tube lysis
3. Formation of concentric ring from Golgi
4. Self-incompatibility triggers a Ca^{2+} dependent signaling cascade in incompatible pollen

37. Major cause of evolution of genes and protein is
1. Point mutation
2. Chromosomal aberration
3. Sexual reproduction
4. Gene duplication and divergence

38. Blood vessel A has thick wall, narrow lumen and no valves while blood vessel B has thin wall, wide lumen and have valves. Here A and B are
1. A is artery and B is vein
2. A is vein and B is artery
3. A is vein and B is capillary
4. A is capillary and B is Artery

39. Bacteria propels with the help of
1. Actin like MreB proteins
2. Myosin
3. Flagella made of protein flagellin
4. Cytoskeleton

40. Photoperiodic Stimulus from leaves to shoot apical meristem/floral meristem is transported through
1. Xylem 2. Phloem
3. Plasmodesmata 4. Apoplast

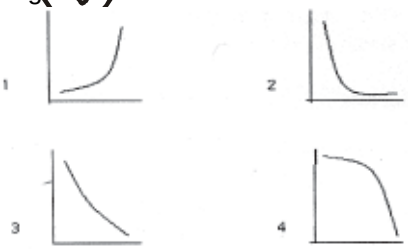
41. Primary carnivores consume 40% production of herbivore and assimilate 70% of energy. What percentage of energy these carnivores assimilates the energy available from herbivores
1. 30 2. 28
3. 10 4. 40

42. Frequency of blood group O in population is 25%. Remaining individual of population have equal number of Blood group A and B. What would be the ratio of Allele frequency between blood group O, A and B
1. 1:1:1 2. 2:2:2
3. 1:1:2 4. 3:3:1

43. The adaptation related to high altitude is
1. Increase in RBC count
2. Decrease in RBC count
3. Increase affinity for oxygen by haemoglobin
4. Decrease affinity for oxygen by haemoglobin

44. Natural selection is primarily based on fitness which is dependent on maximum number of offspring laid for next generation but at present new concept is added where organism help in reproduction of relatives to increase the overall fitness. This concept is termed as
1. Evolutionary fitness 2. inclusive fitness
3. Relative fitness 4. Kin selection

45. Curve representing constant morality at every stage of life would be



46. Goucher disease where glucocerbebrocide are not degraded is related to
1. Mitochondria 2. lysosomes
3. Peroxisomes 4. Golgi

47. The genes for improving rice cultivars have been taken from the Indian rice variety
1. *Oriyza sativa* 2. *0. indica*
2. *O. nivara* 4. *0. rhyzae*

48. Temperature of body is regulated by
1. Hypothalamus 2. Suprachaismatic nuclei
3. Cerebellum 4. Cerebrum

49. Which statement is NOT correct for Vitamin D
1. It helps in bone formation
2. It is produced by skin in presence of UV light
3. It is water insoluble
4. It helps in bone resorption

50. Polar head group in membrane cholesterol is due to
1. Hydroxyl group 2. Long alkyl chain
3. Benzene rings 4. Carboxylic groups

51. Which statement is NOT true regarding genetic drift as an evolutionary force
1. Actin like MreB proteins
2. Myosin
3. Flagelta made of protein flagellin
4. Cytoskeleton

52. Among the following critically endangered plant species is
1. Dipterocarpus nilgirinsensis
2. Saraca indica
3. Cupressus cashmeriana
4. Terminalia arjuna

53. Among the following which is endangered animal
1. Indian tiger
2. Indian lion
3. lion tailed macaque
4. Indian wild ass

54. A pathogen is capable of transovarial transmissions in its vector. During evolution host will become
1. Resistance
2. Susceptible
3. Kill pathogen
4. Cannot be predicted

55. Calculate the pH of acid with $Ka=10^{-6}$ and 0.01 M
1. 0 2. 4
3. 6 4. 2

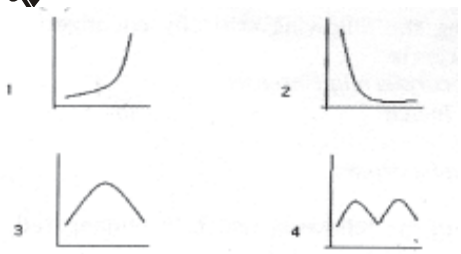
56. Consider that two population are growing exponentially with initial difference in growth rate of 10%. After 10 generation the difference between population size would be
1. 1:1 2. 4:1
3. 2:1 4. 10:1

57. Among the following which microorganism is involved in nitrogen fixation with woody trees?
1. Frankia 2. Rhyzobium
3. Azotobacter 4. Azospirillium

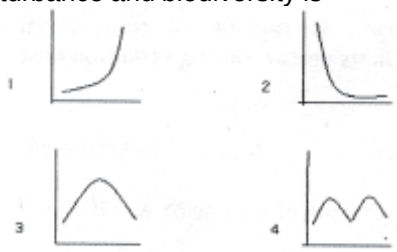
58. Genes between related organism exhibits high variation. The variations would maximally occur in
1. Exons 2. Intron
3. Promoters 4. Polyadenylation site

59. Ecological adaptations in which some organism are favored due to more energy investment on their reproductive rate while other on basis of channelizing energy for homeostasis. Such a selection strategies are termed as
1. K selection and r selection
2. Logistic and exponential selection
3. directional and disruptive selection
4. Kin and group selection

60. In a community there are two species. If a dissimilarity pair wise frequency distribution curve is prepared by comparing them it will look like



61. The correct representation for relation between disturbance and biodiversity is



62. The possible type of gametes formed genotype AABbCCDdEe will be
1. 4 2. 8
3. 16 4. 32

63. After meiosis the 20% gametes are recombinant for two genes. The distance between two genes will be
1. 5 cM 2. 10 cM
3. 20 cM 4. 40 cM

64. If in a operon repressor binds to operator it will lead to
1. Switch on transcription
2. Switch off transcription
3. Enhanced transcription
4. Differential gene expression

65. If activator binds to repressor, it will prevent
1. Transcription
2. Binding of RNA polymerase to promoter
3. Binding of repressor to operator
4. Binding of repressor to promoter

66. in signal transduction trimetric G protein with á, â and ã is involved. Which subunit will activate adenylate cylase
1. á, subunit 2. â Subunit
3. ã subunit 4. All three

67. Receptors for signaling for steroid hormones are located at
1. plasma membrane 2. organelle membrane
3. intracellular 4. no receptor

68. Among closely lying cells signal are communicated by
1. Neurotranmitters 2. Hormones
3. Gap junctions 4. Cell membrane proteins

69. For an enzyme catalyzed reactions exhibiting Michelis Menten equation what would be increase in substrate concentration to increase the rate of reaction from 10% of V max to 90% of V max
1. 80 fold 2. 8 fold
3. 4 fold 4. 2 fold

70. In TCA cycle malonate is competitive inhibitor structurally similar to
1. Succinate 2. Fumarate
3. Oxaloacetate 4. á–keto glutarate

71. Which mineral ion play important role in functioning of photosystem II
1. Magnese 2. Magnesium
3. Iron 4. Molybdenum

72. Primary acceptor of CO_2 in photosynthesis is
1. Ribose
2. Ribulose-5-P
3. Ribulose 1, 5-bis Phosphate
4. 3-Phosphoglycerate

73. During cell cycle sister chromatid are pulled apart during
1. Metaphase 2. Anaphase
3. Prophase 4. Interphase

74. In chromosome 30 nm fibres during metaphase attach to
1. Scaffold 2. Centromere
3. Nuclear matrix 4. Nuclear lamina

75. Which of the following DO Not bring variation in population
1. Random drift 2. Non-random matting
3. Recombination 4. Natural Selection

76. In Drossophila XO are male and XXY are female while in humans XX are female and XY are female. On the basis of given information which statement is NOT true
1. Y chromosome do not play any role in sex determination of drosophila
2. Y chromosome is sex determinant in humans
3. In humans sex determination is based on number of X chromosome to sets of autosomes.
4. In Drosophila sex determination is based on number of X chromosome to sets of autosomes

77. During transposition transposons are exicised by
1. Transposase 2. Nuclease
3. Topoisomerase 4. Exonuclease

78. Which of the statement regarding plasma cell is correct
1. They are produced during secondary immune response
2. They are mature antibody secreting cell
3. They are involved in removal of intracellular viruses
4. Involved in inflammatory responses

79. Immunological diversity in antibody is generated by
1. Rearrangement of immunoglobulin genes
2. Alternative RNA processing

3. Post transcriptional modification
4. Post translation modification

80. In honey bee males are developed partheno-genetically while workers are developed as sexual reproduction. The workers exhibits more similarity among themselves as compare to queen. If workers starts giving organisms par-thenogenetically then offspring would most likely resemble to
1. Among themselves and with mother
2. among themselves and slightly differ from mother
3. Among themselves and with queen
4. Among themselves and with father

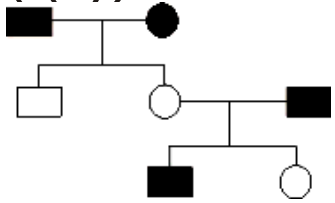
81. Negative potential across plasma membrane is maintained by
1. Active transport 2. Passive transport
3. Ion channels 4. Transporters

82. Receptor mediated endocytosis is carried from specific portions of membrane termed as
1. Coated vesicles 2. Coated Pits
3. Endocytosis 4. Exocytosis

83. Which of the following statement is correct with reference to replication in eukaryotes
1. Single origin and continuous replication
2. Multiple origin and continuous and discontinuous replication
3. Multiple origin and continuous replication
4. Single origin and continuous and discontinuous replication

84. Gene for fungal resistance is found cytoplasm. If a susceptible female and resistant male are crossed then progeny will exhibit
1. All resistance
2. All susceptible
3. Half resistance and half susceptible
4. Cannot be predicted

85. Consider the following pedigree chart



1. X-linked recessive
2. X-linked dominant
3. Sex limited recessive
4. Autosomal dominant

86. Renaturation of human geome has reveled that it contains both repetitive and no-repetitive sequences. Which statement
1. Human have more unique sequences
2. Repetitive sequence are located only to centromere
3. Repetitive sequences renaturate fast
4. Unique sequences renaturate fast

87. In india which conservation program is related with protection of entire "Tropic ladder"
1. Project Tiger 2. Project Elephant
3. Ramsar Sites 4. Bilosphere reserve

88. Area under forest cover in India as per estimates of 2001
1. 7.9 2. 12.7
3. 20.6 4. 16.3

89. Among the following which data alone are capable for preparing dendrogram from given operational taxonomic unit (OTU)
1. Mean of similarity
2. Similarity matrix
3. Characters taken into account
4. Criteria for classification

90. Shannon weaver index for biodiversity characterization can be represented as
1. H="Pi log Pi 2. D=H/log Pi
3. D=**"** (n/N^2) 4. H=log(N)- "log(n)

91. In which of the following condition realized niche exceed over fundamental niche
1. Competition 2. Commensalisms
3. Ammensalism 4. Mutualism

92. Which of the following is characteristic feature of climax community
1. Simple food chain
2. High resilience
3. High productivity
4. Narrow niche specialization

93. Cattle are known to be responsible for green house effect due to
1. high respiration rate
2. more consumption of plant
3. Fermentation in rumen
4. High reproductive rate

94. Gases used by Urey and Miller for experimentation of origin of life by Oparin and Haldane hypothesis was
1. Hydrogen, methane and Ammonia
2. Hydrogen, methane and CO^2
3. Hydrogen, Ammonia, methane and CO^2
4. Hydrogen, Carboxylic acid and Amino acids

95. Highest extinction during history of earth was observed during
1. End of Permian 2. Endo of cretaceous
3. End of Devonian 4. End of Carboniferous

96. Bacteria cannot be classified as species by the biological species concept because they
1. Asexually reproducing organisms
2. high growth rate
3. Exhibits little morphological variations
4. Do not have nucleus

97. In eukaryotes shortening of chromosomes from ends is prevented by
1. DNA polymerase
2. RNA polymerase
3. Telomerase
4. Tranposase

98. Organisms with high growth and production are
1. Ectotherm
2. Endotherm
3. Carnivore Insects
4. Detrivores

99. On molar basis if DNA has 20% cytosine, then percentage of Adenine would be
1. 20% 2. 30%
3. 40% 4. 60%

100. The maximum BOD and minimum DO for pure drinking water should be
1. 25, 5 2. 2, 5
3. 3, 9 4. 0, 6