

**CSIR-JRF-NET Life Sciences**  
**December – 2011**  
**Code – B**  
**ANSWER SHEET**

**PART – A**

Q1. Magnesium powder, placed in an air- tight glass container at .....

Answer : 4. 0.8 bar

Q2. Living beings get energy from food .....

Answer : 3. oxygen

Q3. In  $\Delta ABC$ , angle A is larger than angle C and .....

Answer : 2.  $53^\circ$

Q4. Which of the following statements about .....

Answer : 3. it has steadily increased since the formation .....

Q5. See the following mathematical .....

Answer : 4. (iv) to (v)

Q6. The Number of craters observed due to meteoritic impacts .....

Answer : 4. earlier craters are not preserved .....

Q7. What is the angle  $\theta$  in the quadrant of a .....

Answer : 1.  $135^\circ$

Q8. During a total solar eclipse occurring at .....

Answer : 1. on the following night only

Q9. A cupboard is filled with a large number of balls of 6 different .....

Answer : 4. 6

Q10. The variation of solubilities of two compounds .....

Answer : 3. solubility of X and Y are the same at  $75^\circ\text{C}$

Q11. Restriction endonuclease cleaves DNA molecules at .....

Answer : 1. 4

Q12. A solid cube of side L floats on water with 20% of its volume .....

Answer : 1. 4

Q13. Inner planets of the solar system are rocky, whereas outer .....

Answer : 1. solar heat drove away the .....

Q14. On exposure to desiccation, which of the following .....

Answer : 4. Cocci in clusters

Q15. A bell is rung before giving food to a dog. After doing this .....

Answer : 2. the dog salivates on hearing the bell

Q16. When a magnet is made to fall free in air it falls .....

Answer : 1. a part of the gravitational potential .....

Q17. For an elastic material, strain is proportional to stress .....

Answer : 1.

Q18. The conductance of a potassium chloride solution is .....

Answer : 2. 0.5

Q19. An overweight person runs 4 km everyday as an .....

Answer : 3. 20 % less

Q20. What is the half-life of the radio isotope .....

Answer : 1. 1 day

#### **PART – B**

Q21. A single-strand nick in the parental DNA helix .....

Answer : 4. homologous recombination

Q22. In which form of DNA, the number of .....

Answer : 2. B

Q23.  $\alpha$ -amanitin inhibits

Answer : 2. only RNA polymerase II

Q24. Graft rejection does not involve

Answer : 1. erythrocytes

Q25. Which of the following is not a prosthetic .....

Answer : 4. Pterin

Q26. Reverse transcriptase has both ribonuclease .....

Answer : 2. the degradation of RNA strand

Q27. Toxic shock is caused by

Answer : 2. excessive stimulation of large proportion of T cells by .....

Q28. Horse shoe crabs belong to the group.....

Answer : 2. chelicerata

Q29. Aquatic primary production was measured using .....

Answer : 4. L – D

Q30. The first living beings on earth were .....

Answer : 1. there was no oxygen in air

Q31. The blastopore region of amphibian embryo that .....

Answer : 2. Nieuwkoop center

Q32. Which of the following acts as a branch point for the .....

Answer : 1. farnesyl pyrophosphate

Q33. In a normal human eye, for sharp image formation on the .....

Answer : 2. cornea

Q34. Indirect immunofluorescence involves .....

Answer : 1. immunoglobulin-specific antibodies

Q35. Which of the following processes interferes

Answer : 1. Horizontal gene transfer

Q36. Which of the following groups of .....

Answer : 1. Black buck, .....

Q37. In gene regulation, open reading frame (ORF) implies

Answer : 3. a series of triplet codons that begins .....

Q38. Which replicating DNA, the rate of .....

Answer : 2. 3' → 5' proof reading activity of DNA polymerase

Q39. Which of the following set of cell organelles .....

Answer : 1. chloroplast and peroxisomes

Q40. The atmosphere in a sealed space craft contains

Answer : 2. a mix of oxygen and nitrogen

Q41. To keep them in a totipotent state, embryonic .....

Answer : 2. leukemia inhibiting factor

Q42. One of the methods for finding common regulatory motifs .....

Answer : 2. MEME

Q43. Measurement and mapping with spatial resolution the membrane .....

Answer : 1. radioisotope

Q44. A plant of the genotype AaBb is selfed .....

Answer : 4. 1/16

Q45. In contrast with plant cells, the most distinctive feature .....

Answer : 1. control of cell cycle transitions by protein kinases

Q46. During development of embryos in .....

Answer : 1. establishment of auxin gradients

Q47. Which of the floral whorls is affected in .....

Answer : 3. stamens and carpels

Q48. Chloroplast distribution in a photosynthesizing cells is .....

Answer : 1. move to the side walls

Q49. The membrane lipid molecules assemble .....

Answer : 3. liposome

Q50. Which of the following waves is likely to be absent in

Answer : 3. T

Q51. On the molar scale which of the following interactions in .....

Answer : 2. Hydrogen bonding

Q52. In this flow diagram name the chemicals A, B, C .....

Answer : 4. Renin, Angiotensinogen, Angiotensin I, Angiotensin II

Q53. The Hutchinsonian concept of ecological niche is based on

Answer : 2. multidimensional hypervolume

Q54. A specialist species has a

Answer : 2. narrower niche and high efficiency of niche utilization

Q55. The presence of Salmonella in tap water in .....

Answer : 2. human excreta

Q56. Amino acid selenocysteine (Sec) is .....

Answer : 4. charging of serine into tRNA<sup>ser</sup>, modification .....

Q57. Michaelis and Menten derived their .....

Answer : 1. rate limiting step in the reaction is the breakdown of ES .....

Q58. Ethylene binding to its receptor, does not lead to .....

Answer : 2. phosphorylation of the receptor

(This could be the most probable answer)

Q59. Most common type of phospholipid in .....

Answer : 4. sphingomyelin

Q60. Which of the following maternal effect gene products .....

Answer : 2. Bicoid and Hunchback

Q61. The base analog 2-aminopurine pairs with thymine, .....

Answer : 2. transition

Q62. Which of the following is not a physiological .....

Answer : 4. low photosynthetic rate

Q63. In transverse sections of a young stem, if vallecular .....

Answer : 4. equisetals

Q64. A sample counted for one minute shows a count rate .....

Answer :

Q65. *Batrachochytrium dendrobatidis*, a fungus, has been .....

Answer : 2. frogs

Q66. What kind of aneuploid gametes will be .....

Answer : 3. both  $n + 1$  and  $n - 1$

Q67. The peacock's tail is an example of .....

Answer : 3. sexual selection

Q68. Wetlands are conserved internationally .....

Answer : 4. Ramsar convention

Q69. The rattans and canes that we use in .....

Answer : 2. palms

Q70. Which of the following features is not shown by .....

Answer : 4. Inhibition of early steps in the biosynthesis of .....

### PART - C

Q71. The erythrocyte membrane cytoskeleton consists of a .....

Answer : 3. mutant  $\beta$  spectrin defective in  $\alpha\beta$  dimerization ability

Q72. Synthesis of normal hemoglobin requires coordinated synthesis of  $\alpha$  globin .....

Answer : 3. B, C and D

Q73. Equilibrium constant (K) of noncovalent interaction .....

Answer : 2.  $-2764$  kcal/mole (but answer should be  $-2764$  cal/mole )

Q74. Bacteriophage  $\lambda$  has two modes in its life cycle, .....

Answer : 1. A and B

Q75. Biosynthesis of tyrosine is detailed .....

Answer : 1. ATP, phosphoenolpyruvic acid, .....

Q76. API (APETLA 1) is one of the floral meristem identifying .....

Answer : 4. stimulation of flowering in the .....

Q77. The figure above represents a late zebrafish .....

Answer : 1. A and C

Q78. Following are same statements regarding .....

Answer : 1. A, C and F

Q79. An isolated carotid sinus was prepared so that the pressure .....

Answer : 1. A, B and C

Q80. Number of trials required for rats to .....

Answer : 4. learning was reduced by sleep loss

Q81. in the following inferences is most appropriate .....

Answer :

Q82. Denaturation profiles of DNA are shown below.....

Answer : 3. G + C content of C > B > A in DNA of .....

Q83. Cre/loxP system is used by phage PI to remove terminally .....

Answer : 3.

Q84. Assuming a 1: 1 sex ratio, what is the probability .....

Answer : 1. 0.375

Q85. Maturation-promoting factor (MPF) controls the initiation of mitosis in .....

Answer : 4. cyclin B lacking the cyclin .....

Q86. In an in vitro experiment using radiolabelled .....

Answer : 2. B and C

Q87. The bacterial flagellar motor is a multi-protein complex. Rotation of .....

Answer : 3. mutated  $H^+$

-ATPase

Q88. Pre-mRNAs are rapidly bound by snRNPs which carry out dual steps .....

Answer : 1. A and B

Q89. Assume a male sparrow (species X) is hatched and reared in .....

Answer : 1. It will sing the song of species Y .....

Q90. Consider the following crosses involving grey .....

Answer :

Q91. Genomic DNA of transgenic plants (P1, P2 and P3) obtained .....

Answer : 3. P<sub>1</sub>

contains two, whereas .....

Q92. Figures A and B respectively represent the dideoxy .....

Answer : 3. Frameshift

Q93. The ABO blood type in human is under the control of autosomal multiple .....

Answer : 3. 1/8

Q94. If van der Waals interaction is described by the .....

Answer : 4. dipole-dipole repulsion

Q95. A 1 meter tall object was placed 10 meter in .....

Answer : 2. 1.7 mm

Q96. In human, protein coding genes are mainly organized as .....

Answer : 2. protein coding gene and RNA coding genes

Q97. A fixed smear of a bacterial culture is subjected to the .....

Answer : 2. acid-fast *Mycobacterium* sp

Q98. Survival of intracellular pathogens depends on the levels of .....

Answer : 3. IL-6 treated cells contain more intracellular bacteria than control

Q99. The genetic relatedness (r) of an individual to his nephew is .....

Answer : 2. more than the cost .....

Q100. The following is a schematic representation of region .....

Answer : 3. a-4, b-1, c-2, d-3, e-5, f-6

Q101. Many cancers carry mutant p53 genes, while some .....

Answer : option are not clear

Q102. For a normal heart, the time taken for atrial .....

Answer :  $A_s + A_d = V_s + V_d$

Q103. The following are statements about molecular .....

Answer :

Q104. In 'TaqMan' assay for detection of base substitutions .....

Answer : 2. individual II is homozygous for variant allele

Q105. Identify the synapomorphies in the following cladogram:

Answer : 2. (a) resin canals; (b) seeds with long terminal wing .....

Q106. Enzymes are nowadays used extensively in bioprocessing .....

Answer : 3. protease, pectinase

Q107. A nerve impulse or action potential is generated from transient changes .....

Answer : 2. there is a difference in .....

Q108. When the prospective neurons from an early gastrula of a .....

Answer : 2. A and C

Q109. The pH of blood of a healthy person is maintained at .....

Answer : 4. 7.4

Q110. Insulin and other growth factors stimulate a pathway .....

Answer : 2. B and D

Q111. In E.coli four Hfr strains donate the following genetic .....

Answer : 2.

Q112. Chlorophyll pigment composition and carbohydrate food .....

Answer : 1. Euglenophyta – (i and a) Bacillariophyta – (ii and d) .....

Q113. The hydrolysis of pyrophosphate to orthophosphate is important .....

Answer : 2. 62  $\mu\text{mol}$

Q114. For continuation of protein synthesis in bacteria, ribosomes need .....

Answer : 1. A and D

Q115. A bacterial response regulator turns on gene A in its .....

Answer : 3. cooperativity in binding of the .....

Q116. You are given a group of four mice. Each mouse is .....

Answer : 1. keyhole limpet .....

Q117. The following figure depicts the relationship between .....

Answer : 4. A, C and E

Q118. A monkey undergoes cerebellectomy. After the .....

Answer : 2. B only



Q119. During the spanish conquest of the Inca .....

Answer : 1. A and C

Q120. The graph represents relative plasma concentration of .....

Answer : 3. (A) is FSH and (B) is LH

Q121. Following are some statements about low temperature .....

Answer : 2. A and C

Q122. During a field study, three insects with the following .....

Answer : 1. A-Orthoptera; B-Hemiptera; C-Coleoptera

Q123. Following are some of the statements regarding the effect of .....

Answer : 3. A and C

Q124. T cell proliferation in vivo is to be analyzed .....

Answer :

Q125. Several distinct time periods and different routes might .....

Answer : 2. (i) (iii) (iv)

Q126. Intracellular transport and cytoskeletal organization of a .....

Answer : 3. Rho in GTP bound form

Q127. The most important property of any microscope is its .....

Answer : 1. A and C

Q128. Tumor cells were isolated from a breast cancer .....

Answer : 3. transferrin receptor-conjugated drug

Q129. Stem cell therapies are being used in regenerative medicine .....

Answer : 1. A and B

Q130. In case of morphallactic regeneration:

Answer : 1. there is repatterning of the existing tissues with little new growth

Q131. In an animal experiment:

Answer : 2. cholinergic and non-adrenoceptive neurons

Q132. With respect to the extra embryonic structures formed in the .....

Answer : 1. A and B

Q133. The quantum yield of photosynthetic carbon fixation in .....

Answer : 1. A, B and D

Q134. The decision to become either a trophoblast or inner .....

Answer : 1. cdx 2, Oct 4, Nanog, Stat 3

Q135. The frequencies of two alleles p and q for a gene locus .....

Answer : 3. 0.33

Q136. Following are some statements for synthesis of Jasmonic acid in plants

Answer : 4. A, C and E

Q137. Which of the following behavioural changes are .....

Answer : 2. exploratory behaviour decreases

Q138. From among the five animals listed below, .....

Answer : 2. Amniotic egg: c, d, e; Endothermy: d, e

Q139. Which of the following is not true for a critically endangered species?

Answer : 2. The individuals of the species which have .....

Q140. In the global nitrogen cycle, the following microbial .....

Answer : 2. Denitrification - (d); .....

Q141. Which of the following graphs illustrates the current consensus .....

Answer : 1.

Q142. Suppose you discovered a new species about which you know .....

Answer : 1. Breeds early and more than once in life .....

Q143. Autotrophs in the aquatic ecosystem, unlike their counterparts .....

Answer : 1. Productivity/Biomass ratios are higher ....., higher trophic levels are faster

Q144. In order to prevent tetanus in neonates, one of the .....

Answer : 4. B/d

Q145. Ecological compression differs from character displacement .....

Answer : 1. shorter timescale and does not involve heritable change