



**Note**

CSIR used three different Booklets for June 2012 exam. All of them have same questions except their order (sequence). They have not given question paper to home. This is the collective effort from all **helpBIOTECH** site readers and **helpBIOTECH** Academy CSIR Aspirants. There may be possibility of mistakes and errors.

**Instructions:**

This booklet contains 145 (20 Part A + 50 Part B + 75 part C) Multiple Choice Questions (MCQs). You are required to Answer a maximum of 15, 35 and 25 questions from Part A, B and C, respectively. If more than required number of questions are answered, only first 15, 35 and 25 questions in Part A, B and C respectively, will be taken for evaluation.

**Total marks:** 200

**Time:** 3 hours.

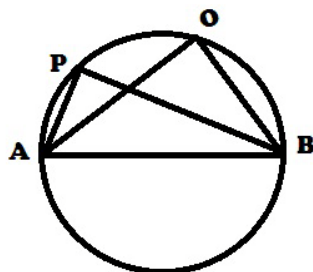
# Questions with Answer Key

## helpBIOTECH Academy, Hyderabad

### CSIR JRF/NET Life Sciences June 2012

#### Part A

1. In the Given Figure, AB is the Diameter of the Circle. If  $AP=2AO$  then



Which of the following is a correct statement for APB?

- a.  $\angle APB = \angle AOB$
- b.  $\angle APB = 2\angle AOB$
- c.  $\angle APB = \frac{1}{2} \angle AOB$
- d.  $\angle APB = 3\angle AOB$

2. The mineral talc is used in the manufacture of soap, because

- A. It bulk the soap

- B. It kills bacteria
- C. It gives fragrance to soap
- D. for smoothness to avoid rashes on skin

Which statements above TRUE?

- a. A and D
- b. A and B
- c. B only
- d. A and C

3. One material exposed to radio isotope chromium for 5 days. After 10 days the observed activity of chromium isotope was 600 disintegrations per day. The half life of chromium isotope is 5 days, than what is the bserved activity after 5 days of exposure

- a. 300
- b. 600
- c. 1200
- d. 1800

4. If the two containers having He and Ar are maintained at constant temperature and have constant root mean square velocities (rms). If the He and Ar were mixed in third container at constant temperature, then the rms velocity of He in mixture

- a. Will remain same
- b. Higher than original
- c. Smaller than original
- d. Will become equal to that of argon

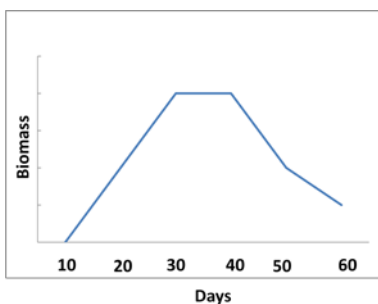
5. Two different container has two moles each of O<sub>2</sub> and H<sub>2</sub> with volume V<sub>0</sub> and at temperature 150 °C and 1 Atm pressure. Both were mixed to react in 3<sup>rd</sup> container to form water vapors till H<sub>2</sub> completely exhausted. What is the volume of the 3<sup>rd</sup> container, which shows 1 atm pressure and 150 °C

- a. V<sub>0</sub>
- b. 2V<sub>0</sub>
- c. V<sub>0</sub>/ 2
- d. V<sub>0</sub>/ 4

6. During midnight of lunar month, waning crescent moon will be

- a. At the zenith
- b. At height of 45° in eastern horizon
- c. In Eastern horizon
- d. In western horizon

7. The following figure shows biomass yield with time (days) for bacteria. The zero growth rate observed during

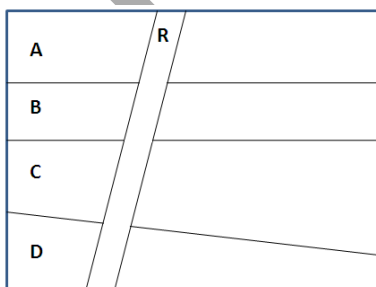


- a. 10th day
- b. 20th day
- c. between 20 and 30 days
- d. between 30 and 40 days

8. A thread is placed with help of two pegs at both the ends so that it remains slack when a pencil is placed against it and drawn. What do we get

- a. ellipse
- b. circle
- c. triangle
- d. square

9. The sedimentary rocks A, B, C and D are interrupted with another rock R. Which of the following is correct?

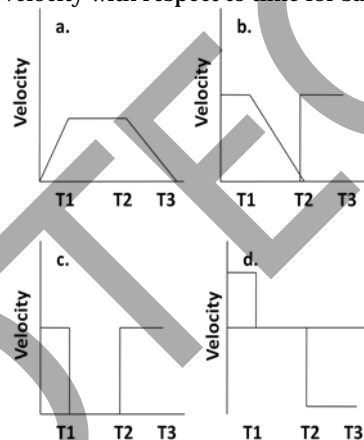


- a. B is youngest followed by R, A, C and D
- b. All rocks are of same age
- c. R is youngest followed by A, B, C and D
- d. D is youngest followed by R, A, B and C

10. 100 g of impure material, represented by a formula X.5H<sub>2</sub>O was heated at 150 °C to remove impurities. The weight of substance after removing impurities was 8 g. What is the percentage of impurities in material

- a. 20 %
- b. 10 %
- c. 8 %
- d. 80 %

11. The figure below shows the displacement-time curve for a Body. Which of the following is correct representation of velocity with respect to time for same body?



12. If weight of a rod on weighing on spring balance is 0.5 kg and weight of beaker filled with liquid is 3 kg. Also when the rod is slightly immersed in liquid the weight recorded on spring balance is 0.4 kg then what will be the weight recorded for the beaker

- a. 2.9 kg
- b. 3.1 kg
- c. 3 kg
- d. 3.5 kg

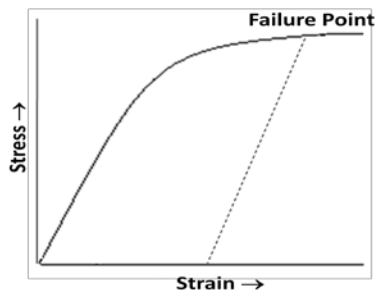
13. Two sets of rabbit population, A and B increase at the rate 25% and 50% each year respectively. If the present no of individuals of both the population are same. What will be the ratio of population of B over A in next two years.

- a. 1.25
- b. 1.44
- c. 1.75
- d. 2.00

14. A park forms a right angled triangle whose angles are in arithmetic progression. The smallest side has a length of 10m. Find the total length of fencing wire to be used around the garden.

- a. 60m
- b. 50m
- c. 20m
- d. 47.32m

15. The strain on a solid material due to external stress represented below diagram. Which statement is TRUE?



- a. The solid remains plastic till failure point
- b. The solid remains elastic till failure point
- c. The solid permanently gets deformed at failure point
- d. The solid was initially plastic later on becomes elastic at failure point

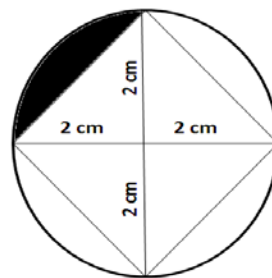
16. A tall and red plants were crossed with pure line dwarf and white plants. Resultant progeny shows equal amount of tall red and dwarf white plants, then genotype of parents would have been

- a. TTRR X ttrr
- b. TTRr X ttrr
- c. TtRR X ttrr
- d. TtRr X ttrr

17. The ice skaters can skate over ice because of

- a. Increase in density of ice
- b. Decrease in density of ice
- c. Decrease in pressure on ice
- d. Increase in pressure on ice

18. The area of shaded portion shown in figure would be



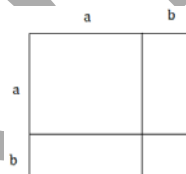
- a.  $\pi-2$
- b.  $\pi/2$
- c.  $\pi/4$
- d.  $\pi/4-\pi/2$

19. Which among the following will have a higher transpiration rate?

- A: Plant in still air
- B: Plant in turbulent Air
- C: Plant in still air but night

- a.  $A > B > C$
- b.  $B > C > A$
- c.  $B > A > C$
- d.  $C > A > B$

20. Which of the following statement satisfies relation shown in figure above?



- a.  $(a + b)^3 = a^3 + b^3 + 3a^2b + 3ab^2$
- b.  $(a - b)^2 = a^2 - 2ab + b^2$
- c.  $(a + b)^2 = a^2 + 2ab + b^2$
- d.  $(a + b)(a - b) = a^2 + 2ab - b^2$

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**Part B**

21. CD 19 is marker for

- a. T-cells
- b. B-cells
- c. Macrophage
- d. Natural Killer cells

22. The following peptide with sequence FARPCSRPGF was digested with trypsin, chymotrypsin and carboxypeptidase A. The number of peptide fragments produced

- a. 0
- b. 2
- c. 3
- d. 4

23. On treating pre-B cell with phorbol ester, which of the following is NOT a outcome

- a. It phosphorylates NF-kB
- d. It activates protein kinase C
- c. It activates NF-kB for translocation into nucleus
- d. It helps in removal of inhibitor from NF-kB

24. The nuclear export signal on cytosolic proteins helps them to be exported from the nucleus after

- a. At the time of replication
- b. before DNA replication
- c. Mitosis
- d. Mitosis and meiosis

25. ABC transporter are

- a. Found only in eukaryotes
- b. Non-specific for molecule to be transported
- c. Have both transmembrane domain and nucleotide-binding domain
- d. Are P-glycoproteins

26. Which nitrogen of adenine gets protonated if pH of surrounding is lowered from 7 to 3?

- a. N3
- b. N1
- c. N7
- d. N9

27. B-DNA is stabilized by the

- a. Hydrogen bonding
- b. Ionic interaction
- c. Vander wall Interactions
- d. Covalent Linkage

28. The major biosynthetic pathways for terpenes synthesis are

- a. Malonic acid and MEP pathway
- b. Mevalonic acid and MEP pathway
- c. Shikimic acid and Mevalonic acid pathway
- d. Malonic acid and Mevalonic acid pathway

29. Match the following

- |             |                   |
|-------------|-------------------|
| A. Azolla   | 1. Nostoc         |
| B. Casurina | 2. Bradyrhizobium |
| C. Guneria  | 3. Anabena        |
| D. Soyabean | 4. Frankia        |

- a. A-3, B-2, C-3, D-1
- b. A-4, B-3, C-2, D-1

- c. A-3, B-1, C-4, D-2
- d. A-1, B-2, C-3, D-4

30. Regulatory sequences for rRNA genes resides at

- a. Spacer region between genes
- b. Multiple sites at non-transcribe spacer region
- c. 5' flanking region of individual rRNA gene cluster
- d. Within the coding transcribed region of gene

31. Certain eukaryotic mRNA has IRES sequence because

- a. Inhibit translation
- b. helps in mRNA synthesis during stress survival
- c. Neutralizes effect of siRNA
- d. enhances transcription

32. *Mycobacterium tuberculosis* infects mainly

- a. Macrophages
- b. Alevelor cells
- c. Epithelial cells
- d. TH cells

33. The false statement about siRNA is

- a. 21-23 bp long with 2-3 nt overhang at 5' end
- b. Generally do not act at transcriptional level
- c. It is induced by viruses
- d. It processed by RISC complex

34. Integrin binds to \_\_\_\_\_ ECM molecule?

- a. Collagen
- b. Laminin
- c. vitronectin
- d. Fibronectin

35. The major stimulus for bacterial spore formation

- a. Heat Stress
- b. pH
- c. Cold stess
- d. Nutrient limitation

36. Not correct match?

- a. erbA-Thyroid receptor
- b. fos-PDGF receptor
- c. erbB - EGF receptor
- d. ras-GTPase activity

37. Phosphatidyl Serine is present on \_\_\_\_\_ side of bacterial membrane

- a. Outer leaflet of plasma membrane
- b. Inner leaflet of plasma membrane
- c. Both leaflets of plasma membrane
- d. Generally present on inner leaflet but may be outside under certain conditions

38. The protein, Ced-9 regulates apoptosis in *C. elegans*, which controls the Ced-4 protein activity. Which of the following will lead to apoptosis?

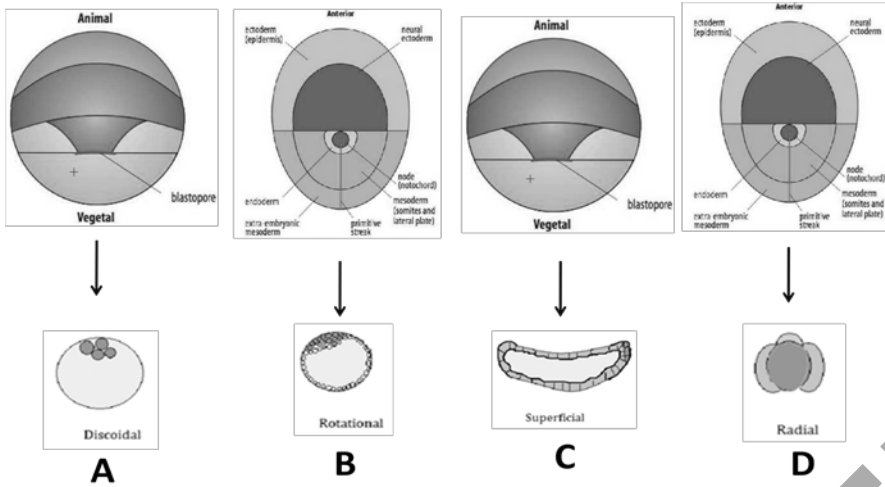
- a. Over expression of Ced-9
- b. Loss of function of Ced-4
- c. Loss of function of Ced-9
- d. Loss of function both of Ced-9 and Ced-4

39. Meaning of fermentation in biochemistry (C) and Microbial technology (T) are used in different sense. Which of the following is true?

- a. Both are same

- b. All T is C but reverse is not true
- c. All C is T but reverse is not true
- d. Both are aerobic process

40. Diagram below shows fate map of two organisms and successive type of cleavage it follows



Which of the following is correct combination?

- a. A and B
- b. A and C
- c. B and D
- d. B only

41. Origin of Knewkoop center and dorsal organizer is *Xenopus levis* is from

- a. Ectoderm and endoderm
- b. Ectoderm and mesoderm
- c. Mesoderm and endoderm
- d. Mesoderm only

42. The following protein(s) of PSII which binds to P680 and primary acceptor pheophytin are

- a. p700
- b. FeS complex
- c. CP1 and CP2
- d. D1 and D2 Proteins

43. Following is not true for *Agrobacterium* infection of plant?

- a. Vir A and G binds to acetosyringone
- b. Vir D1/2 is responsible for single stranded cut in T-DNA
- c. Vir B forms bridge between bacterium and plant cell during infection
- d. Vir F and VIF coats single stranded T-DNA during passage from bacterium to nucleus of plant cell

44. The following is not a mechanism for removing pollutant from soil using phytoremediation?

- a. Phytodegradation
- b. Phytoextraction
- c. Phytomining
- d. Chelating pollutant by secretion of chemicals by plants

45. Which of the following is suitable for cloning 140 kb eukaryotic DNA fragments for constructing genomic library?

- a. Phage b. Plasmid
- c. BAC d. YAC

46. The use of biotinylated antibody in ELISA?

- a. increase specificity but compromises sensitivity
- b. decreases both specificity and sensitivity

- c. increase sensitivity without compromising specificity
- d. cannot be used after transfer of protein on nitrocellulose sheet

47. Secondary sewage treatment involves

- a. Sedimentation of organic wastes
- b. Killing of pathogens by chlorination and opsonization
- c. Use of trickling filters
- d. Filtration

48. Which of the following pair are responsible for site specific recombination?

- a. DNA polymerase III and ligase
- b. DNA polymerase I and ligase
- c. DNA polymerase II and ligase
- d. Restriction endonuclease and ligase

49. If we want to test toxic effect of drug on liver then which would be suitable choice?

- a. Liver cell line
- b. Intact liver
- c. Kupffer cells
- d. Mixture of kupffer cells and liver cells

50. If 'r' denotes correlation coefficient and 'm' denotes slope of regression, then changing both X and Y axis will

- a. change 'r' only keeping 'm' constant
- b. keeps both 'r' and 'm' constant
- c. change 'm' only keeping 'r' constant
- d. changes both 'r' and 'm'

51. As the plants are adapted for many photoreceptors for different wavelengths, which is true?

- a. phytochrome A perceives red light
- b. phytochrome C perceives far red light
- c. phytochrome and cryptochrome perceives blue light
- d. phytochrome B predominantly perceives far red light

52. Phloem Loading in plants is characterized by

- a. movement of triose phosphate from chloroplast to cytosol
- b. movement of sugar from source to sink in sieve element
- c. mass flow of phloem sap to different parts of plants
- d. transport of sugar from photosynthetic bundle sheath cell to companion cell

53. During pregnancy, the correct reason for initiating maternal behavior in females?

- a. high level of estrogen and progesterone in blood
- b. changes in uterine lining
- c. high prolactin level in blood
- d. sight of male

54. Sympathetic system increase heart rate by regulating

- a. L type  $\text{Ca}^{2+}$  channel.
- b.  $\text{Na}^{+}$  channel
- c. T type  $\text{Ca}^{2+}$  channel
- d.  $\text{Cl}^{-}$  channel

55. One person suffering diabetes takes regularly 1 ml of insulin at 9 AM. One day he took 1.5 ml of insulin at scheduled time considering that he will go to party at 11 AM. But that day, he missed breakfast but took sufficient lunch in party. Which of the following scenario would be most suitable?

- a. he will be hyperglycemic before lunch
- b. he will be hypoglycemic after lunch
- c. he will be hypoglycemic before lunch
- d. Blood glucose level will remain in control before and after lunch

56. A tRNA gene is mutated at anticodon region to recognize stop codon and allow translation beyond pre mature stop codon in mRNA transcribed from mutated protein coding gene, such that functional protein is produced. Such a phenomenon is termed as
- Reverse mutation
  - Neutral mutation
  - Nonsense suppressive mutation
  - Point mutation
57. A change on one locus to another locus of the same gene results in mutation. The two copies of mutated same gene termed as
- complementation group
  - linkage group
  - duplicate genes
  - allele
58. A male mouse always produces female puff on mating. The reason is
- defect in spermatogenesis
  - All sperms germ cells have X chromosomes
  - Activation of lethal gene associated with Y chromosome
  - Activation of lethal gene associated with X-chromosome
59. Two plants species having cob length of 9 cm and 3 cm were crossed. Assume trait for cob length is polygenic and additive property, what would be the cob length of progenies?
- 3 cm
  - 6 cm
  - 9 cm
  - 12 cm
60. How many gametes would be formed from genotype AaBBccDdEe?
- 8
  - 16
  - 32
  - 64
61. The correct explanation for paraphyletic group?
- contains unrelated organisms
  - includes recent ancestors
  - includes all common ancestors
  - includes all representatives but ancestors are not included
62. Which of the following microorganism extensively utilized in organic farming?
- Rhizopus*
  - Trichoderma viride*
  - Mucor*
  - Fusarium*
63. NOT an adaptation to xerophytic conditions in plants?
- Sunken stomata
  - Sparse stomata
  - Lenticular tissues
  - Sclerenchymatous tissues
64. If the milk is left open in vessel, at first, lactose is fermented by bacteria producing acid. Later there is proteolytic degradation activity which increases pH and finally left over fat is degraded by another type of bacteria. This is an example of
- Competition
  - Microevolution
  - Ecological succession
  - Antagonism
65. Which amongst the following has the highest per molecule green house effect?
- CO<sub>2</sub>



- b. CH4
- c. NOx
- d. CFCs

66. According to Hardy-Weinberg equilibrium, the allele frequency of gene pool will not change when

- a. There is microevolution
- b. There is migration
- c. There is genetic drift
- d. There is no evolution

67. Consider the following events in history of life?

- I. prokaryotic cell
- II. eukaryotic cell
- III. natural selection
- IV. organic macromolecules
- V. formation of replicating molecule

Which of the following is correct sequence?

- a. d→e→I→c→II
- b. IV→V→I→II→III
- c. IV→V→III→I→II
- d. V→III→I→II→IV

68. During inter sexual selection the development of certain traits is seen only in males only, due to

- a. Males experience lesser energy expenditure through maintenance of weapons, such as horns and antlers, than do females.
- b. Male reproductive success is limited by access to forage more than female reproductive success is by access to forage
- c. Female has very high reproductive and breeding cost as well as investment in parental care
- d. Female reproductive success is more limited by access to males than male reproductive success is access to females.

69. The best technique to identify the *Mycoplasma* infection in animal cell line?

- a. ELISA
- b. PCR
- c. Southern Hybridization
- d. Northern Hybridization

70. In drug delivery, the major disadvantage of using liposome is

- a. It is phagocytosed by neutrophils
- b. It intercalates in plasma membrane
- c. It is unstable and has small shelf life
- d. Drug entrapment efficiency is very low

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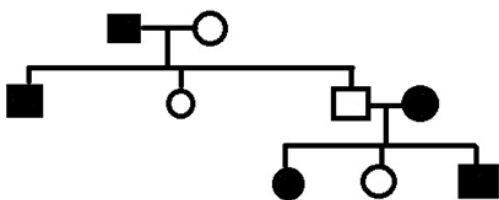
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## Part C

71. Consider the following pedigree chart



The pedigree chart above can be used to investigate different modes of inheritance such as

- A. Autosomal dominant
- B. Autosomal recessive
- C. X-linked dominant
- D. X-linked recessive

Which of the following modes can be represented by pedigree chart above?

- a. A
- b. C
- c. A and D
- d. B and C

72. Below is sequence of carboxyl terminal domain of adenylate kinase, an enzyme which phosphorylates ADP into ATP.

Tyr-gly-Lys-Ser-Arg-Leu-Val-Asp-Ile-Pro-Ser-Asp-Arg-Ser-Ile-Glu-Glu-Val-Val-His-Leu-Val-Glu-Gln-Ala-Val-Arg-Gly-Leu

The probable conformation of above peptide sequence would be?

- a. Hydrophobic  $\alpha$ -helix
- b. Leucine Zipper
- c.  $\beta$  hair pin
- d. Amphipathic  $\alpha$ -helix

73. The levels of FSH during infancy and adult conditions are almost same, but sperm production is observed only in adults. Even mRNA for FSH receptors in testicular cells is almost same in both age groups. Which of the following experiment can resolve the above puzzle?

- a. Culture leydig cells and add LH hormone to see testosterone production
- b. Culture leydig cells and add testosterone to see comparative rise in c-AMP in both age groups
- c. Culture leydig cells and add FSH and LH to see comparative rise in c-AMP in both age groups
- d. Culture leydig cells and add FSH to see comparative rise in c-AMP in both age group

74. There is a polypeptide of 51 residues and 100 bonds among all the bonds can rotate. If every bond rotates in 3 orientations, how many conformations are possible for this polypeptide?

- a.  $3^{100}$
- b.  $100^3$
- c.  $51 \times 3 \times 100$
- d.  $3 \times 100$

75. The phosphoglucomutase catalyses Glucose-6-P  $\leftrightarrow$  Glucose-1-P. The standard free energy change ( $\Delta G^0$ ) of the is  $+1.3 \text{ kcal mol}^{-1}$  at  $25^\circ\text{C}$ . If initial concentration of glucose-1-P was used to carry out reaction, then the concentration of glucose-6-P and glucose-1-P at equilibrium would be

- a. 50 mM and 50 mM respectively
- b. 45 mM and 96 mM respectively
- c. 96 mM and 45 mM respectively
- d. 100 mM and 10 mM respectively

76. To investigate the  $T_m$  of DNA it has been observed that  $\Delta C_p = 50.6 \text{ kcal mol}^{-1}$ . The Gibbs free energy change at  $370\text{C}$  will be

- a.  $2.5 \text{ kcalmol}^{-1}$

- b. 0.5 kcalmol<sup>-1</sup>
- c. 5.0 kcalmol<sup>-1</sup>
- d. 25 kcalmol<sup>-1</sup>

77. The following statements regarding functioning of pax6

- A. generates competence in optic vesicle
- B. generates competence in head ectoderm
- C. Optic vesicle can induce lens formation of any part of head ectoderm which expresses pax6
- D. Lens formation can also be induced by BMP and FGF besides pax6

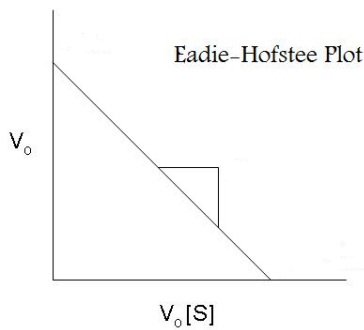
Which of the following statement is CORRECT?

- a. B and C
- b. A and B
- c. C and D
- d. B only

78. As compared to intact mitochondria, why the microsome obtained from inner membrane of mitochondria is preferred to investigate mechanism for electron transport chain and ATP synthesis?

- a. Difficult to purify mitochondria
- b. Easy to study individual enzyme of inner membrane
- c. Intact mitochondria do not survive outside cell
- d. It is easy to maintain the different concentration of NAD, FAD and ADP with isolated microsomes

79. In Eadie-Hofstee plot, when an enzyme catalyzed reaction is plotted  $V_o$  and  $V_o/S$ , a straight line is observed. This graph can be used to get



- a.  $K_m$
- b.  $K_{cat}$
- c.  $V_{max}$
- d.  $K_m$ ,  $V_{max}$  and  $K_{cat}$

80. In order to study biochemical pathway in bacteria, they were exposed to low doses of UV radiation and four mutants were isolated which are auxotroph for compound 'A'. The compounds B, C and D are known to be precursors in biochemical pathway for A. These mutants were grown on minimal media containing various precursors A, B, C and D of compound A. The results are as follows

Mutants	A	B	C	D	E
1	+	-	-	-	-
2	+	-	-	-	+
3	+	-	-	+	+
4	+	-	+	+	+

“ + ” = Growth on medium  
 “ - ” = No growth

Which of the following is CORRECT biochemical pathway?

- a.  $A \rightarrow B \rightarrow C \rightarrow D$
- b.  $D \rightarrow C \rightarrow B \rightarrow A$
- c.  $B \rightarrow C \rightarrow D \rightarrow A$
- d.  $B \rightarrow D \rightarrow C \rightarrow A$

81. Cystic fibrosis is caused by a mutation in the gene CFTR transporter protein for chlorine. To test this both wild type and mutated type CFTR proteins were embedded in membrane of liposome in absence of protease or denaturants. It was observed that neither wild type nor mutant transporter on liposome were able to uptake chlorine from surrounding. The possible reason is

- a. Wild type CFTR protein got mutated
- b. CFTR inserted in invert topology in membrane of liposome
- c. CFTR lost affinity for chlorine
- d. CFTR lost its functional conformation

82. The drug Ouabain inhibit  $\text{Na}^+\text{-K}^+$  pump, which blocks the uptake of glucose by epithelial cells of intestine. Which statement represent CORRECT mode of action of ouabain?

- a. blocks  $\text{Na}^+$  transport from intestinal lumen to epithelial cells
- b. blocks  $\text{Na}^+$  transport from intestinal lumen to interstitial cells
- c. blocks  $\text{Na}^+$  transport from interstitial cell to intestinal lumen
- d. blocks  $\text{Na}^+$  transport from epithelial cells to intestinal lumen

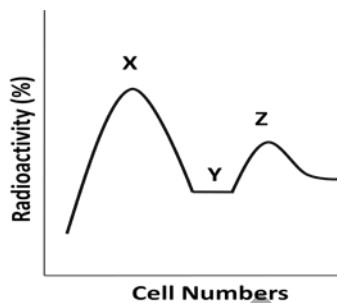
83. In an experiment following conditions were observed for *lac* operon

- i) allolactose is bound to repressor
- ii) cAMP concentration is high in the cell
- iii) CRP/CAP was interacting with RNA polymerase

Which of the following is most appropriate condition in experimental medium?

- a. only lactose is present
- b. only glucose is present
- c. both glucose & lactose is present
- d. glucose is absent & lactose is present

84. Animal cell cultures were exposed to  $^3\text{H}$ -thymidine for brief period during active growth and radioactivity was measure and cells were counted using Flow cytometry as shown below



Which of the following is correct?

- a. X is in G2, Y in G1 and Z in G1+M
- b. X is in G1, Y in S+G2 and Z in M
- c. X is in G1, Y in S and Z in G2+M
- d. X is in G1+S, Y in M and Z in G2

85. NOT a correct statement for plant aquaporin?

- a. found both in plants and animals
- b. cannot transport ammonia
- c. Activity is regulated by phosphorylation
- d. Activity is regulated by pH

86. To assess vegetation cover in four different forests, a researcher used sensors and information collected is being represented below in form of average spectral values

Forest	Average spectral value	
A	05	01
B	06	20
C	07	20
D	08	11

the order of vegetation cover in four different forest will be?

- a. A>B>D>C
- b. D>C>B>A
- c. A>B>C>D
- d. A>D>B>C

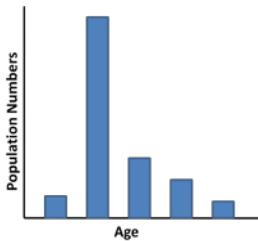
87. The Lotka-Voltern's equation as shown below represents a competition among two different species

$$\frac{dN_1}{dt} = r_1 N_1 \frac{(K_1 - N_1 - \alpha_{12} N_2)}{K_1} \quad \text{and} \quad \frac{dN_2}{dt} = r_2 N_2 \frac{(K_2 - N_2 - \alpha_{21} N_1)}{K_2}$$

If the inter-specific competition coefficient ( $\alpha_{12}$ ) is smaller than 1, it means

- a. Individuals of species 1 has lesser inhibiting effect on individuals of species 2 as compare to on their own species
- b. Individuals of species 1 has greater inhibiting effect on individuals of species 2 as compare to on their own species
- c. Individuals of species 2 has greater inhibiting effect on individuals of species 1 as compare to on their own species
- d. Individuals of species 2 has lesser inhibiting effect on individuals of species 1 as compare to effect of species 1 on its own members

88. The bar diagram represents the age class distribution of a population



The following is valid conclusion based on above graph?

- a. Age class distribution is not in equilibrium
- b. Age class 2 has maximum fecundity
- c. Age class 2 has maximum survival
- d. Age class distribution is in equilibrium

89. If synthetic RNA polymer of alternating AU sequences is used for in-vitro translation, then which of the following statement is CORRECT regarding peptide synthesized?

- a. having repetitive single amino acid sequence
- b. having repetitive amino acid sequence of three different amino acids
- c. having repetitive amino acid sequence of two different amino acids
- d. synthesizing three different polypeptides each of single type of amino acid

90. Trinitro phenol lipopolysacchahride (TNP-LPS) was injected into Mouse A with and Trinitro phenol keyhole limplet hemocyanin (TNP-KLH) with mouse B, respectively. After 2 weeks, spleen cells were harvested and B cells and T-cells from mouse A and B were co-cultured in different combination as shown below. Which of the following combination will produce highest Immunoglobulin G?

- a. BTNP-LPS X TTNP-LPS
- b. BTNP-KLH X TTNP-KLH
- c. BTNP-KLH X TTNP-LPS
- d. BTNP-LPS X TTNP-KLH

91. During replication, removal of Okazakki fragments and gap filling is done by

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

92. If the diameter of cylindrical histone octamer is 9 nm and height 5nm, which are 32 million in nucleus of diameter 6 $\mu$ . what fraction nucleus is occupied by histone?

- a. 1/ 11

- b. 1/ 21
- c. 10/ 11
- d. 10/ 21

93. The following technique can be used for study of DNA (Promoter)-Protein interaction (Regulatory protein) under invivo conditions?

- a. RNAase protections Assay
- b. Gel Retardation Assay
- c. Chromatin Immunoprecipitation
- d. DNase hypersensitivity Assay

94. Keyhole limpet hemocyanin (KLH) was digested into 10 peptides and was injected into ten different mice. The mice were again re-injected with the same 10 different KLH peptides and response was estimated. It was observed that each mouse strain respond against each peptide of KLH. But when mouse from two different strains are crossed the F1 progeny can respond against both the peptides against which their parents responded individually. The probable reason is

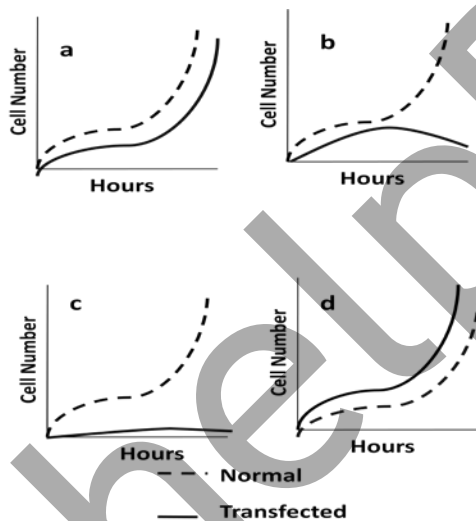
- a. Mouse strains responding to different KLH peptides have different T cell receptors
- b. Mouse strains responding to different KLH peptides cannot process KLH
- c. Mouse strains responding to different KLH peptides have different MHC haplotypes
- d. Mouse strains responding to different KLH peptides lacks MHC class I

95. Which of the following statement are NOT correct?

- I. Adherins join actin to neighboring cell-cell
- II. Desmosomes join cell-matrix and connect actin to cell-matrix
- III. Gap junctions are required to transport water soluble substances across the cell
- IV. Hemodesmosomes join cell-matrix and connect intermediate filaments to cell-matrix
- V. Tight junctions have occluding molecules and join two neighboring cells together

- a. II and III
- b. III and IV
- c. II
- d. IV and V

96. A eukaryotic cell line was transfected with *wee2* kinase gene which modifies important cell cycle regulatory protein *cdc2*. If transfection efficiency is 50 % then which of the following is correct representation of growth for cell lines



97. The pathogenic bacterial protein from was digested and peptides of 5 to 8 amino acids were injected in rats to generated peptide specific antibodies (PSA). To detect bacterial antigen by western blotting antisera from experimental rats was used. Even on using high concentration of antisera no results were obtained on western blot. The probable reason may be

- a. PSA were not stable
- b. PSA were not raised as adjuvant was not used
- c. PSA cannot be used to recognize native bacterial antigen
- d. PSA were not raised as peptides were not linked to carrier

98. The receptor mediated endocytosis of pathogen carried out by macrophage, in which receptor interacts with LPS of *Leishmania* finally endosomal vesicle is formed. TLR-2 is responsible for recognizing LPS and help in phagocytosis and final processing in phagolysosome. Some possible treatments are

- A. Treatment with drug methyl  $\beta$  cyclodextrin
- B. Treatment with ammonium chloride as to raise pH of lysosome
- C. Treatment with anti-TLR-2 antibody

Which of the following treatment will have lowest count of *Leishmania* in macrophage?

- a. B and C
- b. A and C
- c. A and B
- d. A only

99. Read the following experimental conditions, which will help in assessing the role of oncogene and tumor suppressor gene in cancer?

- a. Use of transgenic mouse over expressing tumor suppressor gene and loss of function in oncogene
- b. Use of transgenic mouse over expressing both tumor suppressor gene and oncogene
- c. Use of transgenic mouse over expressing oncogene and loss of function in tumor suppressor gene
- d. Use of transgenic mouse with loss of function both in oncogene and tumor suppressor gene

100. Which of the following statement is correct?

- a. Centrolecithal egg  $\rightarrow$  Holoblastic cleavage
- b. Telolecithal egg  $\rightarrow$  Holoblastic cleavage
- c. Isolecithal egg  $\rightarrow$  Meroblastic cleavage
- d. Isolecithal egg  $\rightarrow$  Holoblastic cleavage

101. Consider the following statements regarding specification?

- (A) Potency of cell is equal to normal fate in mosaic development
- (B) Potency of cell is greater than normal fate in mosaic development
- (C) Potency of cell is equal to normal fate in regulative development
- (D) Potency of cell is greater than normal fate in regulative development

Which of the following statement is correct?

- a. A and B
- b. B and C
- c. B and D
- d. A and D

102. The following statements regarding development of limb in amphibians

- A. Removal of AER
- B. If hind limb mesenchymal cell is placed below fore limb AER, at the end hind limb structure would develop
- C. If hind limb mesenchymal cell is placed below fore limb AER, at the end fore limb structure would develop
- D. AER is grafted in limb bud

Which of the following statement is CORRECT?

- a. A and B
- b. C and D
- c. A, C and D
- d. A, B and D

103. The CORRECT statements regarding plant development

- A. Root cap cells are dead cells
- B. Shoot apical meristem gives shoot axillary meristemom
- C. Epidermal cells responsible for lateral roots
- D. Lateral meristem and radial meristem are responsible for secondary growth in roots

- a. A and C
- b. B and C
- c. A and D
- d. B and D

104. The following statements are correct regarding activation of phytochromes?

- a. Red light inactivates Pr activity
- b. When red light and far red light are in equal fluence rate Pr is activated
- c. When red light and far red light are in different fluence rate Pr is activated
- d. Red light converts Pr to active form Pfr

105. Consider the following statement regarding position of components of photosystem in chloroplast of plant

- I. PSI and PSII are co-localized in stromal thylakoid
- II. PSI is preferentially localized in stromal thylakoid
- III. Cytochrome b6/f complex is not a membrane resident complex
- IV. PSII is preferentially localized in granal thylakoids

Which of the following statements are CORRECT?

- a. I and II
- c. I and III
- b. II and IV
- c. II and III

106. The following statements regarding phenyl ammonia lyase (PAL) and chalcone synthase (CS) enzyme involved in synthesis of flavanoids

- I. Substrate for PAL is phenyl alanine and for CS is chalcone
- II. PAL catalyze conversion of phenyl alanine to cinnamic acid
- III. PAL catalyze conversion of phenyl alanine to p-coumaric acid
- IV. Coumaryl CoA is converted to chalcone by chalcone synthase

CORRECT statements are?

- a. I and II
- b. II and IV
- c. I and III
- d. III and IV

107. The energy of photon required for excitation of chlorophyll molecule from ground state to excited state is

- a. more than ground state of chlorophyll molecule at reaction center
- b. equal to energy gap between ground state and excited state
- c. equal to ground state of chlorophyll molecule at reaction center
- d. more than ground state but lesser than excited state

108. The following statements regarding plant growth hormones.

- I. ABA promotes leaf senescence independent of ethylene.
- II. ABA enhances root growth and decreases shoot growth at low water potential.
- III. ABA inhibits gibberellin induced seed germination
- IV. Seed dormancy is controlled by ratio of GA and ABA

Which one of the following combination of above statements is correct?

- a. II, III and IV
- b. I, II and IV
- c. I, III and IV
- d. I, II and III

109. The following abiotic stress conditions leads to decrease in water potential and dehydration of cells among the plants?

- a. Drought, Salinity and Chilling stress
- b. Salinity, high temperature and Flooding
- c. Drought, Salinity and Freezing stress
- d. Oxidative, Salinity and Flooding

110. The rate of spontaneous reverse mutation from  $lac^-$  to  $lac^+$  is being investigated in *E. coli*. Which of the following statement support more directed evolution instead of spontaneous reverse mutation in *E. coli*?

- a. Rate increase during nutrient depletion
- b.  $lac$  gene mutation is always greater than other genes



- c. lac gene mutation always lesser than other genes
- d. Rate of reverse mutation for lac is high when placed on lactose medium as compare other genes

111. Under experimental conditions, when sperm and egg are kept together in test tube, they fail to fertilize the egg. But when the similar sperms are directly placed in uterus of model organism fertilization is observed. The reason for this contrast result is

- a. Egg release some chemical to help sperm to fertilize
- b. The content of female reproductive tract interacts with sperm and activates fertilizing activity
- c. Hormone in female body helps in activating sperm
- d. The sperm must travel some distance to gain fertilizing ability

112. It has been observed, 24 month infant monkey do not produce testosterone but 4 year adult on attaining puberty produces testosterone. If 2 year monkey is injected with gonadotropin, it starts producing testosterone even before puberty. This experiment suggest that

- a. Puberty depends on age
- b. Hypothalamus is highly active during pre puberty period
- c. Pituitary gland secretion is similar during all age groups
- d. Pituitary is active in all stages of life

113. The receptor cells of Corti organ of hair cells, are mechanoreceptors that have hair like stereocilia protruding from one end. Which of the following statement is CORRECT?

- a. Movements of the hair cell stimulate the basilar membrane because it is attached to the hair cell.
- b. Whenever the stereocilia bend, ion channels in the plasma membrane of the hair cell close, and the resulting ion movements hyperpolarize the membrane
- c. Whenever the stereocilia bend, ion channels in the plasma membrane of the hair cell open, and the resulting ion movements depolarize the membrane and create a receptor potential.
- d. The stereocilia are in contact with the overhanging basilar membrane, which projects inward from the side of the cochlea

114. A woman patient suffering thyrotoxicosis shows high level of thyroxine in blood which is attributed due to failure in feedback inhibition in hypothalamic-pituitary-thyroxine circuit. If we further scan blood in detail patient will also show the high level of

- I. TSH
- II. Thyroid stimulating Igm
- III. TRH
- IV. Parathyroid hormone

The following statements are CORRECT?

- a. I and II
- b. B and III
- c. I and III
- d. II and IV

115. A person suffering from night blindness moves to doctor. Doctor initially advised patient to consume more of fish oil but one month later seeing no improvement doctor gives him injection of vitamin A. Still there was no improvement in visibility. The probable reason for failure of both treatments may be lack of any of the enzyme given below

- I. Retinol dehydrogenase
- II. Retinal synthase
- III. Retinal isomerase
- iv. Retinal reductase

According to your opinion which is correct reason for night blindness in above case?

- a. IV only
- b. III and IV both
- c. I only
- d. II and III both

116. A germ cells undergoing division produces four daughter cells out of which two are haploid and two are aneuploid. The probable reason is

- a. Non-disjunction during meiosis-I
- b. Non-disjunction during meiosis-II
- c. Non-disjunction during both meiosis-I and meiosis-II
- d. Non-disjunction during either meiosis-I or meiosis-II

117. When two pure plant with white flowers were crossed, all F1 progeny were red flowered. The observed ratio of red to white flower in F2 is 9:7. Based on above information

- I. Color of flower is controlled by two different genes, mutation in both leads to white flower.
- II. Both genes for flower color show independent assortment
- III. The above case is example of complementary genes
- IV. The above case is example of duplicate genes

The following conclusions are CORRECT?

- a. I and II
- b. II and III
- d. I, II and III
- c. I, II and IV

118. The following represents some steps in Krebs cycle



Which of the following is correct for A, B, C and D?

- a. NAD→NADH, NAD→NADH, ADP→ATP, FAD→FADH2
- b. NAD→NADH, FAD→FADH2, GDP→GTP, FAD→FADH2
- c. NAD→NADH, NAD→NADH, GDP→GTP, FAD→FADH2
- d. NAD→NADH, FAD→NADH2, ADP→ATP, NAD→NADH

119. Four auxotrophic mutant strains with lack of same phenotype were investigated to estimate number of complementary group involved. In complementation test when mutant strain 1 was crossed with mutant strain 2 wild type phenotype restored but no other crosses lead to complementation. Based on above information the four mutant strains falls in how many complementation groups?

- a. 1
- b. 2
- c. 3
- d. 4

120. Under what conditions lysogenic cycle is more preferred, when compared to lytic cycle in bacteriophages?

- a. It causes mutation and become more resistant.
- b. helps in bacterial survival and bacteria is never lysed so continuously virus can be produced and released from bacterium
- c. it remain in the host in the hidden phase but still has the potential to cause infection.
- d. help in preventing mutation in viruses due to host repair machinery

121. Two auxotrophs of bacteria A (a<sup>+</sup> b<sup>+</sup> c<sup>-</sup> d<sup>-</sup>) and B (a<sup>-</sup> b<sup>-</sup> c<sup>+</sup> d<sup>+</sup>) having mutation in different genes were allowed to co-culture in liquid medium for 24 hours and then were plated on minimal medium to assess prototrophs. Low amount prototrophs were observed on minimal medium. This may happen due to recombination between two auxotrophs or by spontaneous mutation. Which of the following can be used as control to reject the possibility of formation of prototroph due to spontaneous mutation?

- a. Culture auxotroph strain A and B in same liquid medium for 24 hours and then plate on minimal medium to observe the frequency of prototroph
- b. Culture prototroph obtained from strain A and B separately in liquid medium for 24 hours and then plate on minimal medium to observe the frequency of auxotroph
- c. Culture auxotroph strain A and B separately in liquid medium for 24 hours and then plate on minimal medium to observe the frequency of prototroph
- d. Culture prototroph obtained from strain A and B in same liquid medium for 24 hours and then plate on minimal medium to observe the frequency of auxotroph

122. The below table represents distribution of five different species in four (A, B, C and D) communities investigated to assess biodiversity

Community	Species 1	Species 2	Species 3	Species 4	Species 5
A	20	5	5	10	10
B	10	10	10	10	10
C	10	15	5	10	10
D	40	1	1	1	1

In which of the following community value of Pielou's evenness index will be 1?

- a. A
- b. C
- c. D
- d. B

123. Match the following temperature and rainfall with suitable biomes

Temperature and Precipitation	Biome
A. 25 °C and 255 cm	1. Temperate forest
B. 15 °C and 150 cm	2. Savannah
C. 15 °C and 100 cm	3. Temperate rain forest
D. 25 °C and 255cm	4. Tropical rain forest

The correct combinations are

- a. A-4; B-3; C-1; D-2
- b. A-3; B-4; C-2; D-1
- c. A-2; B-1; C-3; D-4
- d. A-1; B-4; C-2; D-3

124. The following is CORRECT statement as per neutral theory of molecular evolution?

- a. Human and monkeys differ more in their coding sequences as compare to non-coding sequences
- b. Human and monkeys have same mutation rate in their coding sequences as well as non-coding sequences
- c. The rate of mutation is faster in humans as compare to monkey
- d. Human and monkeys differ more in their non-coding sequences as compare to coding sequences

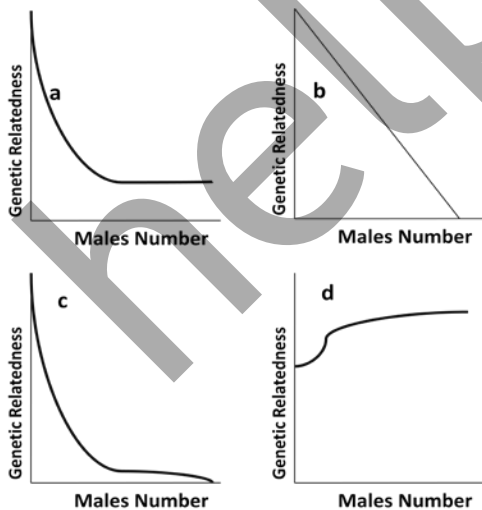
125. Following observations were made during line-transect method to assess the population of two different species of mammals

		Smaller	Larger
A	Transect Length (km)	50	50
B	Number of animals recorded	100	110
C	Mean perpendicular distance from transect line (m)	10	60

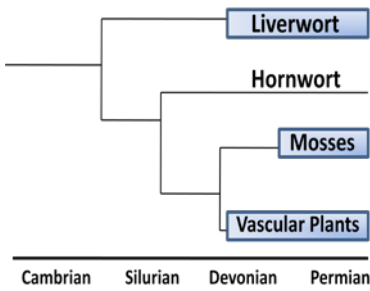
The following is CORRECT conclusion drawn based on above information?

- a. Smaller species is are abundant but lesser frequent as compare to larger species
- b. Smaller species is less abundant but more frequent as compare to large species
- c. Larger species is more abundant but lesser frequent as compare to smaller species
- d. The large species is seen more frequently but its abundance cannot be compared with smaller species

126. Generally genetic relatedness among the female progeny in hymenoptera is 0.75. Which of the following graph correctly represents genetic relatedness among the female progeny in the members of hymenoptera if the female is mated with more than one male?



127. Below cladogram represents phylogenetic relationship and occurrence of fossil records among different group of plants.



Consider the following statement in reference to above cladogram:

- (A) Phylogenetic history can accurately established on basis of fossil record
- (B) The moss diverged from other plant groups during early Silurian period
- (C) Fossil sets maximum age of lineage
- (D) Fossil sets minimum age of lineage
- (E) Liverworts diverged from other plant groups during early Ordovician period

The following statements are CORRECT?

- a. A, B, D and E
- b. A, B, C and E
- c. B, C and E
- d. B, D and E

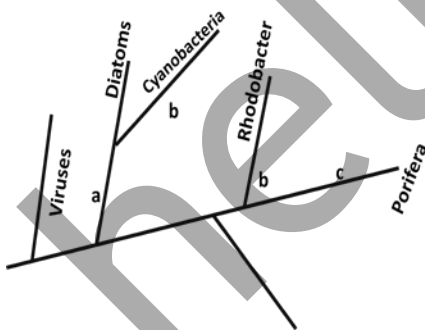
128. Which hypothesis explains, the occurrence of Himalayan floral element in Western Ghats?

- a. Continental drift theory
- b. Coromondal coast hypothesis
- c. Deccan trap hypothesis
- d. Himalayan glaciations theory

129. Which of the following group of vertebrates you will find limbless animals?

- a. Reptiles and mammals
- b. Reptiles
- c. Amphibians and Reptiles
- d. Amphibians

130. Identify 'a', 'b' and 'c' from the cladogram



- a. a-plastid, b-mitochondria, c-multicellularity
- b. a-mitochondria, b= multicellularity, c- plastid
- c. a-plastid, b- multicellularity, c- mitochondria
- d. a-mitochondria, b-plastid, c-multicellularity

131. Consider there are 'n' numbers of alleles at a locus in a population of diploid organism. What would be the proportion of homozygotes in population if

- (A) All alleles are equal proportion

(B) All alleles are not in equal proportion

- $1/n$  and  $1/n$
- $1/n$  and  $>1/n$
- $1/n^2$  and  $>1/n^2$
- $1/2n$  and  $<1/2n$

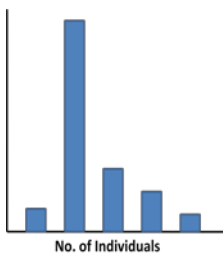
132. The following characteristics of a threatened animal

- Population declined 90 % in last 10 years
- Population below 50 individuals
- Extent of area occupancy below 100 sq Km
- Probability of extinction in wild at least 50 % in upcoming 10 years

As per IUCN red data book, the organism would be kept in category of

- Endangered
- Vulnerable
- Extinct in wild
- Critically endangered

133. A scientist collected the data from 300 different islands and grouped all the species together based on number of individuals present as shown in below



What could be correct inference drawn from above

- Majority of species have more than 60 individuals
- The graph show uneven distribution of species on all islands
- The sum of the column will give total number of species present on all islands
- The graph show even distribution of species on all islands

134. The population of northern elephant seal reduced to around 20 in 1800. When variation is assessed in present northern elephant seal no variations were recorded at molecular level. The probable reason for lack of variation among the population of northern elephant seal is

- Elephant seal lives in constant environment so there was no need to bring variation
- Natural selection has removed most of variants
- Mutation rate in northern elephant seal is very low
- Bottle neck effect and genetic drift

135. The following is safest way for stem cell therapy in a patient with damaged liver?

- Transplanting liver cells from healthy donor to patient
- Grafting ES cells from donor directly to patient
- Grafting stem cells from umbilical cord directly to liver of patient
- Transforming stem cells from patient into iPS cells and allowing them to re-differentiate into liver cells under in vitro conditions and then graft in patient

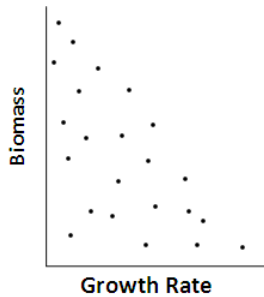
136. During investigation of gluco-corticoid receptor by Radioimmuno Assay (RIA), tritiated glucocorticoid is added to RIA cocktail. But no radioactive counts were observed. Some of the possible reasons are

- Amount of radioactive hormone was too low
- During storage of radioactive hormone radioactivity may have been lost
- Antibody may not have been added to cocktail
- The specific activity of radio isotope was too low

The correct reason(s)

- a. I only
- b. III only
- c. I and IV
- d. II and III

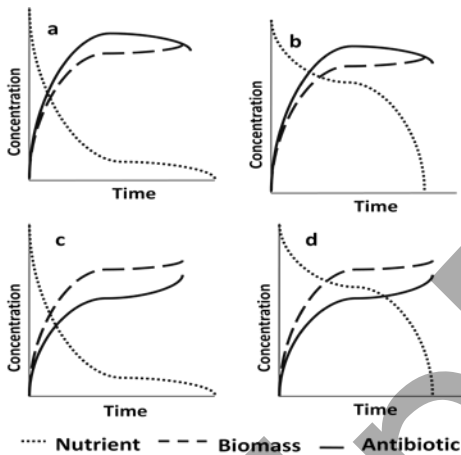
137. Graph below represents relation between growth rate and growth yield in microbial cultures for randomly variable conditions.



Which of the following statements are TRUE?

- a. Growth rate and growth yield are not related
- b. Growth rate and growth yield are inversely proportional
- c. High growth yield cannot be obtained with high growth rate in above microbial cultures
- d. Growth yield is negatively correlated with growth rate

138. Which of the following graph correctly depicts the antibiotic production by bacterial species?



139. In microarray analysis, which gene sequence must be preferred for preparing target sequence to investigate genome expression?

- a. 3' region from coding DNA sequence and 3' untranslated region
- b. Any part from coding DNA sequence
- c. Sequence specifically from intron 1 from gene
- d. 5' region from coding DNA sequence and 5' untranslated region

140. A transgenic plant was prepared by introducing of 'X' gene. It was observed that out of 100 transgenic plant only 70 of them are showing high level expression of 'X' gene, while remaining show low level of expression. The probable reason is

- a. Suppression effect of gene X
- b. Co-suppression effect of gene X
- c. Knock down effect of gene X
- d. Gene silencing effect

141. In the labeling of 5' end of DNA, polynucleotide kinase was used. The protocol followed is shown below

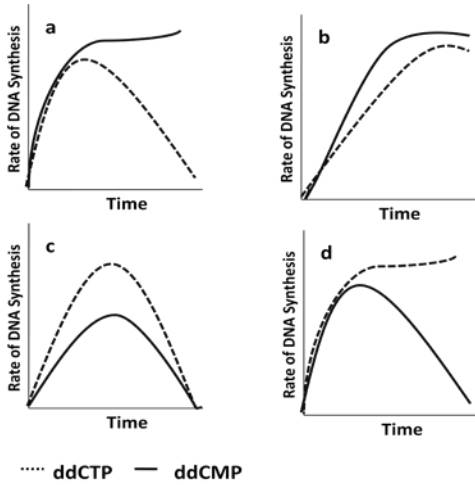
5' dephospho DNA  $\rightarrow$   $\gamma$ 32 ATP + T4 polynucleotide kinase and incubation for 2 hours  $\rightarrow$  Ammonium sulfate  $\rightarrow$  Tris EDTA  $\rightarrow$  Ethanol

If the trace amount of ammonium ion was present with DNA tube, then which of the following is correct

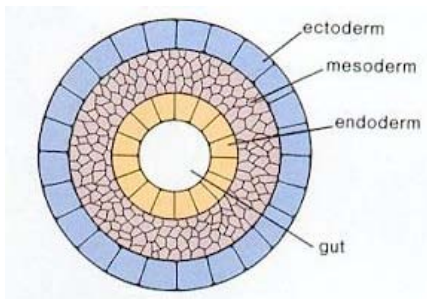
- a. Ammonia with dephosphorylated DNA increase the rate of T4 polynucleotide kinase

- b. Ammonia with dephosphorylated DNA increases stability of T4 polynucleotide kinase
- c. Ammonia with dephosphorylated DNA decreases stability of T4 polynucleotide kinase
- d. Ammonia with dephosphorylated DNA decrease the rate of T4 polynucleotide kinase

142. During in-vitro DNA replication dideoxy CMP and dideoxy CTP were added in two different PCR tubes along tritium labeled dTTP. Which of the following graph correctly represent the DNA synthesis in both tubes if all other conditions are suitable for DNA synthesis?



143.



Based on above picture, the organism is

- a. triploblastic, coelomate and vertebrate
- b. diploblastic, coelomate and invertebrate
- c. diploblastic, coelomate and vertebrate
- d. triploblastic, coelomate and invertebrate

144. Question on Ligand, affinity

## Answers

**Part A** 1a 2a 3c 4a 5d 6b 7d 8a 9c 10a 11 12b 13b 14d 15c 16d 17c 18a 19c 20c

**Part B** 21b 22b 23a 24d 25c 26b 27a 28b 29c 30c 31b 32a 33a 34d 35d 36b 37d 38d 39c 40c 41c 42d 43d 44c 45c 46c 47c 48d 49d 50b 51c 52d 53c 54c 55c 56c 57d 58c 59b 60a 61c 62b 63c 64c 65b 66d 67c 68c 69a 70c

**Part C** 71a 72d 73d 74a 75c 76 77a 78d 79d 80c 81b 82d 83a 84c 85b 86 87d 88a 89c 90c 91c 92 93c 94c 95c 96 97d 98c 99c 100d 101d 102d 103d 104d 105b 106b 107b 108c 109c 110d 111b 112d 113c 114b 115c 116b 117d 118c 119b 120c 121c 122d 123b 124d 125d 126 127d 128d 129c 130d 131b 132d 133b 134d 135d 136a 137d 138d 139d 140b 141d 142a 143d

**Credits:** Tapish Milind Dongre, Prabhas, Vinit Patel, Sachin Rathod, Madhuri Kumari, Mahima Sahu, Anil Malik, Vinay Kamal, Sanjeev Balda, Akhila Mallela, Bhupendra Pandey, Dr. Partha Pratim Borah, Ankit, Rashpal, Shweta, Chinmaya Mahapatra, Muzafar, Ipshita Bora, Heina Aswal, Jay, Reena Yadav, Swati Soni, Deepak Gola, Chirag, Raj Kumar Sharma, Bharati, Poonam, Bhavin, Sharmila Das, Ankit Gupta, Reshmi, Soni Sindhu, Rohan Sharma, Rajnakshatra, Kalaiselvan K, Siddhartha Mukherjee, Sudhakar, Nivas, Varinder Kaur, Amita, Madhu Pareek, Nag, Kamini Srivastava, Rohit C, Bhuwan Singh, Moovendhan, Rahul, Nitish, Sanjeev Balda, Gangotri Mall, Suman Dutta, P. Divya, S Aadesh, Darshan, Vidya Sagar, Sunil Choudhry, Rahul, Raghawendra Kumar, Ragini, Manjujanani, Ana, Saurabh, Sandeep Mishra, Rajesh, Sunil Kumar, Mohsina Anjum Khan, Avanthika, Dr. P. Hariprasad, Uma, Vijay, Sai Shyam, Anil, Vinay Detha, Pawan Kumar, R.K.Govindarajan, Palak Agrawal, K.Lakshmana Kumar, Jebarani, Swapna, Arun K Upadhyay, Rakkimuthu.R, Snehal Jhala, Sangmesh Chadcan, Mobassir, Bindu, Laxmi, Chandrajeet Kumar, Rajeev Purohit, Sweta Sharma, Santosh.K, Saurabh Srivastava, N Prasada Rao, Pankaj, Ritumoni, Smitha K R, Madhu Pareek, Azhar, P Natraj, Rohan, Giri, Preetam Singh, Arun Kumar Upadhyay, Psr Reddy, Dnyanesh, Shyam, IFAS, Deepthy.J, Vidya Sagar, Kadri Shad, Madhuri, Anbumani, Poonam Rana, Meghana Patel, Priya, Ashish Chaudhary, Trupti Dasharath Valloji, Valloji Trupti Dasharath, Rajita Turen, Hussainsahebmaliki, Reema S, Divya Asok, Chaudhari Arif, Mamta Verma, Chintha Madhubabu, Rajesh Kumar.T, Yogesh Kumar, Prateebha C, G.Bhagirath, Indra R, Nitesh Priyadarshi, Parvez Ahmad, Varsha S. Patil, Mohan Sharma, Seshagirirao, M.Moovendhan, Chaudhari Arif, Mahesh, Abirami, Tanushree Agarwal, Harvijay Singh, Karthikeyan, Spoorthi, Sourajit Das, Megha, Irshad, Paras Sehgal, Harika R, V.Srinivas, Annu, Tafzil Ali, Nishith, Prasanna Kumar, Mohana Krishna, Arun Kumar, Pankaj Rawat, Amit Kumar, Ashif Ali, Samrat Ghosh, Vishal Srivastava, Elina Khatoon, Chandrakant.Khandre, Amalesh Mondal, Rishi Sharma, M.Pardhasaradhi, Nishat Ahmed, Ranita De and Many



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