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## CSIR Life Science Sample Questions (Part 9 of 10)

1. In an animal experiment Electrical stimulation of an area in the brain A increased a function F which was prevented by systemic injection of adrenergic antagonistic, prazosin. Injection of carbachol (cholinergic agonist) into A also increased function F which was, however not prevented by systemic injection of adrenergic antagonistic, prazosin. The results are likely to be due to the stimulation of
  - a. Nonadrenergic and cholinceptive neurons
  - b. Cholinergic and non-adrenoceptive neurons
  - c. adrenergic terminals in 'A'
  - d. both neurons and fibres passing through 'A'
2. With respect to the extra embryonic structures formed in the mammals, the possible functional attributes have been designated
  - a. Allantoin stores urinary waste and helps mediate gas exchange. It is derived from splanchnopleure at the caudal end of the primitive streak.
  - b. Amnion is a water sac and protects the embryo and its surrounding amniotic fluid. This epithelium is derived from somatopleure.
  - c. Chorion is essential for gas exchange in amniote embryos. It is generated from the splanchnopleure.
  - d. Yolk sac is the last embryonic membrane to form and is derived from somatopleure.

Which of the above statements are correct?

- a. 1 2
- b. 1 3

c. 2 3

d. 1 4

3. The quantum yield of photosynthetic carbon fixation in a C3 plant and C4 plant is studied as a function of leaf temperature. Following are some statements based on this study.
- a. At lower temperature the quantum yield of C3 plant is lower than C4 plant.
  - b. In C4 plant quantum yield does not show a temperature dependence.
  - c. Since the photorespiration is low in C4 plants because of CO<sub>2</sub> concentrating mechanism, quantum yield is not affected.
  - d. At higher temperature the quantum yield of C3 plant is lower than C4 plant.

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

a. 1 2 4

b. 2 3 4

c. 1 2 3

d. 1 3 4

4. The frequencies of two alleles p and q for a gene locus in a population at Hardy-Weinberg equilibrium are 0.3 and 0.7, respectively. After a few generations of inbreeding, the heterozygote frequency was found to be 0.28. The inbreeding coefficient in this case is
- a. 0.42
  - b. 0.28
  - c. 0.33
  - d. 0.67

5. Following are some statements for synthesis of jasmonic acid in plants
- a. 12-oxo-phytodienoic acid is produced in chloroplast and transported to peroxisome.
  - b. Action of lipoxygenase, allene oxide synthase and allene oxide cyclase takes place in peroxisome.
  - c. 12-oxo-phytodienoic acid is first reduced and then converted to jasmonic acid by  $\beta$ -oxidation.
  - d. Final production of jasmonic acid takes place in chloroplast. Action of allene oxide synthase and allene oxide cyclase takes place in chloroplast.

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

a. 1 2 3

b. 2 4

c. 3 4

d. 1 3

6. Which of the following behavioural changes are expected in a rat when its nucleus accumbens is experimentally ablated?
- a. Aggressive behaviour increases
  - b. Exploratory behaviour decreases
  - c. Nest-building activity increases
  - d. Level of parental care drops
7. From among the five animals listed below, match the two attributes-amniotic egg and endothermy, with the correct animal (s) :
- a. fish
  - b. frog
  - c. crocodile
  - d. pigeon and 5 zebra

Which of the following choice is best suitable?

- a. Amniotic egg: b, c, d; Endothermy: d, e
  - b. Amniotic egg: c, d, e; Endothermy: d, e
  - c. Amniotic egg: a, b, c, d; Endothermy: c, d, e
  - d. Amniotic egg: b, c, d; Endothermy: c, d, e
8. Which of the following is NOT true for a critically endangered species?
- a. Reduction of population breeding ability due to increased relatedness through the action of incompatibility mechanisms in plants or behavioral difficulties in animals.
  - b. The individuals of the species which have declined to low numbers are still a genetically open system.
  - c. Loss of some alleles from the species causing loss of genetic diversity with consequent inability of respond rapidly to selection.
  - d. Expression of deleterious alleles and increased homozygosity increases mortality of young, and inbreeding depression leads to reduced offspring fitness.