2017

1. Which one of the following is NOT correct?
    a. Island ecosystems are less prone to biological invasion because of their distance from mainland.
    b. Invasive species have greater phenotypic plasticity compared to native species
    c. Invasive species have high dispersal ability.
    d. At a large scale, diversity rich ecosystems are generally more prone to invasion.
2. A species of grass grows around a mine area having patches of heavy metal contaminated soil. Some of the populations of the species grew selectively on the soil that was contaminated with heavy metals. Over a period, though the tolerant and non- tolerant grass populations were continuously distributed and not separated by geographical barriers, they eventually evolved different flowering time and became different species. What kind of speciation would you call this?
    a. 1. Allopatric speciation
    b. Sympatric speciation
    c. Parapatric speciation
    d. Bottle-neck effect.
3. Which one of the following is in the correct decreasing order for the major reservoirs carbon on Earth?
    a. Terrestrial soils>Terrestrial vegetation > Atmospheric CO_2> Large Lake sediments
    b. Terrestrial soil>Large Lake sediments > Terrestrial vegetation>Atmospheric CO_2
    c. Atmospheric CO_2 > Large Lake sediments >Terrestrial soils > Terrestrial vegetation
    d. Large lake sediments Terrestrial soils
4. The correct order of periods from Palaeozoic to Mesozoic era is
    a. Triassic> Jurassic> Cretaceous> Cambrian> Ordovician >Silurian >Devonian> Carboniferous> Permian
    b. Palaeocene> Eocene> Oligocene >Miocene> Pliocene> Pleistocene >Holocene
    c. Cambrian> Ordovician >Silurian >Devonian> Carboniferous> Permian>Triassic> Jurassic> Cretaceous
    d. Pliocene >Eocene >Oligocene >Silurian> Devonian >Carboniferous>Triassic> Jurassic> Cretaceous
5. Flufftails in mainland Asia show high variation in tail colour. However, in the far out Pacific island, the flufftails show very little variation in tail colour. This variation in tail colour can be explained by all of the following EXCEPT
    a. founder effect
    b. homologous evolution
    c. genetic drift
    d. frequency dependent selection
6. Following are the descriptions used by conservation biologists for characterizing species/groups in a community:
    a. Species with a disproportionally large effect on its environment relative to its abundance
    b. Species defining a trait or characteristics of the environment.
    c. Species whose conservation leads to direct protection of other species
    d. Species which is instantly recognizable and used as the focus of a broader conservation effort.

7. Which of the following combination correctly identifies these species/groups?

    a. A-Keystone species, B-Indicator species C-Flagship species, D-Umbrella species

    b. A-Keystone species, B-Indicator species C-Umbrella species. D-Flagship species

    c. A-Indicator species, B-Flagship species C-Umbrella species, D-Keystone species

    d. A-Umbrella species, B-Indicator species C-Keystone species, D-Flagship species

8. 7.As per national air quality standard for India, which one of the following options gives correct concentration limits (μg m^3, annual) of various gaseous air pollutants for a residential area?

    a. SO-100, NO-40, 0, 40, CO-50

    b. SO-50, NO_2-40, 0-100, CO-02

    c. SO-40, NO-50, 0, 50, CO-10

    d. SO-50, NO-100, 0,-40, CO-02

9. Column A lists names of evolutionary biologists and column B lists descriptions of evolutionary mechanisms proposed by them in random order.

Column A		Column B	
A.	Jean-Baptiste Lamarck	(i)	Variation at the molecular level is selectively neutral
B.	Charles Darwin	(ii)	Inheritance of acquired characters
C.	Motoo Kimura	(iii)	Differential reproduction of genotypes
D.	Seawall Wright	(iv)	Changes in allele frequency due to random genetic drift

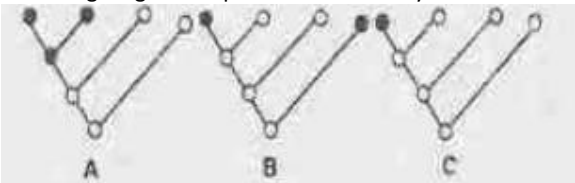
    a. A-(i), B-(ii), C-(iv), D-(iii)

    b. A(ii), B-(iii), C-(i), D-(iv)

    c. A-(iii), B-(i), C-(ii), D-(iv)

    d. A-(ii), B-(iii), C-(iv), D-(i)

10. Following diagrams represent various ways in which a character may evolve:



Which of the following is the correct definition for the character evolution patterns shown above?

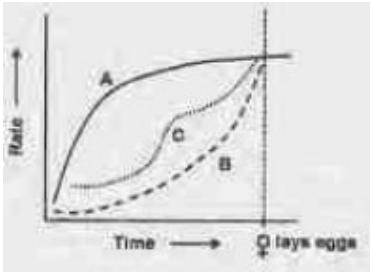
    a. A-Autapomorphy, B-Synapomorphy, C - Homoplasy

b. A-Autapomorphy, B-Homoplasy, C- Synapomorphy

c. A-Synapomorphy, B-Autapomorphy, C- Homoplasy

d. 4.Synanomorphy. B-Homoplasy, C Autapomorphy

11. To understand the singing behaviour in song- birds, the following three characters were measured as shown in the graph:



i. Territoriality rate

ii. Female fertility rate

iii. Song rate

Which one of the following conclusions is most appropriate?

a. Male birds sing as a display of strength to rivals and to attract females.

b. Male birds sing to display parental care behaviour.

c. Male birds sing only to display that females are sexually receptive.

d. Male birds sing only to deter other male rivals from competing for territories.