

CBT SEPTEMBER 2023

CLASS – XII: BIOLOGY

GENERAL INSTRUCTION :

SCORE AND REVIEW OF ALL THE QUESTIONS WILL BE PROVIDED IN THE EMAIL TO ALL THE STUDENTS ON NEXT DAY AND AFTER CLOSING OF QUIZ TIME.

IMPORTANT : ALL THE STUDENTS SHOULD FILL THE CORRECT SCHOOL NAME FROM DROP DOWN BUTTON

CHAPTERS COVERED:

Chapter- Evolution , Human Health and Diseases , Microbes in Human welfare.

Q.1: It is thought that adaptive radiation gets triggered by ecological opportunity. Ecological opportunity causes loss of competitors which is the key of innovation. Both predators and competitors in an environment have the potential to cause an increase in the population disrupting the stabilizing selection. Since, genetic diversity is related positively with population size, with increase of population, genetic diversity will also increase to a great extent. With reduced stabilizing selection phenotypic diversity can also increase. In addition, intraspecific competition will increase, promoting divergent selection to use a wider range of resources. These conditions in ecology promote adaptive radiation.

- In the case of Hawaii and the Galapagos, the volcano created a new ground in the middle of the ocean. This is the same for aquatic species, formation of a new water body would have done the same function. For instance, the tectonic movement which gave rise to the East African Rift and ultimately led to formation of Rift Valleys Lakes. An extinction process can provide the same result, forming niches previously occupied by different species that are extinct now.



1. _____ was the island where Darwin visited and discovered adaptive radiation?

- Archipelago
- Galapagos
- Port Blair
- Lakshadweep

Answer: (b) - Galapagos

FEEDBACK: During the voyage of Darwin, he visited the Galapagos island. There, he came across different varieties of species. He saw the variations in the modification of beaks of finches.

2. Species which have diverged after origin from common ancestor giving rise to new species adapted to new habitats and ways of life is called as _____

- a) Adaptive radiation
- b) Divergent evolution
- c) Convergent evolution
- d) Mutation

Answer: (a) Adaptive radiation

FEEDBACK: Adaptive radiation is a process that gave rise to a variety of species that originated from its original species. Darwin's finches show adaptive radiation. They developed different beak varieties from the seed-eating variety.

3. Lemur is a placental mammal that resembles _____ of Australian marsupials.

- a) Bobcat
- b) Numbat
- c) Spotted cuscus
- d) Flying phalanger

Answer: (c) Spotted cuscus

FEEDBACK: Lemur resembles spotted cuscus. They appear to be similar because of the phenomenon called adaptive radiation. They have similar looks and appearance but does not have a common ancestral line.

4. Assertion: Darwin's finches show a variety of beaks suited for eating large seeds, flying insects, and cactus seeds.

Reason: Ancestral seed-eating stock of Darwin's finches radiated out from South America mainland to different geographical areas of the Galapagos Islands, where they found competitor-free new habitats.

A -Both the assertion and reason are true and the reason is a correct explanation of the assertion

B -Both assertion and reason are true but the reason is not the correct explanation of the assertion

C -Assertion is true but the reason is false

D -Both assertion and reason are false

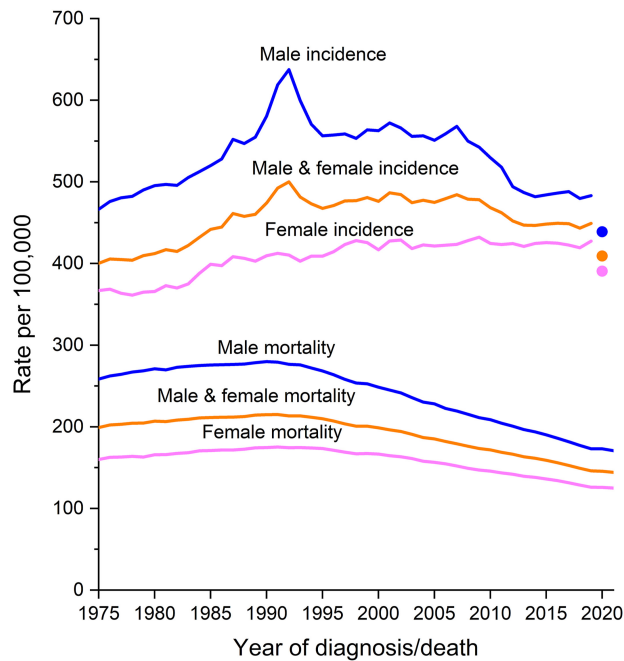
Answer: (A) Both the assertion and reason are true and the reason is a correct explanation of the assertion

FEEDBACK: The correct option is A Both the assertion and reason are true and the reason is a correct explanation of the assertion.

The Darwin finches originally come from the mainland of South America. Since Galapagos islands are 1000 km away from the mainland, originally a small group of finches migrated; these were originally seed-eating birds. Upon getting a competitor-free new habitat, to partition the resources and prevent struggle for existence, Darwin's

finches developed a variety of beak modifications. So both the assertion and reason are true and the reason is the correct explanation of the assertion.

Q.2: Trends in cancer incidence (1975–2020) and mortality (1975–2021) rates by sex, United States. Rates are age adjusted to the 2000 US standard population. Incidence rates are also adjusted for delays in reporting. Incidence data for 2020 are shown separate from trend lines.



- Which trend can be observed in cancer cases in males and females from 1975 to 2020.
 - Higher in men than in women because of the high incidence of prostate cancer.
 - Mortality rate is inching up with years in both males and females.
 - Higher in women than in men because of the high incidence of breast cancer.
 - . Cancer incidence in men generally decreased until around 2013 but has since stabilised.
- A. Both 1 and 2
 B. Only 4
 C. Both 2 and 4
 D. Only 2

Answer. (C) Both 2 and 4

FEED BACK: The spike in incidence for males during the early 1990s shown in graph reflects a surge in the detection of asymptomatic prostate cancer as a result of rapid, widespread uptake of prostate-specific antigen (PSA) testing among previously unscreened men. Thereafter, cancer incidence in men generally decreased until around 2013 but has since stabilized. The graph with female incidences is going up in the given figure.

- Genes that have been identified in normal cells which lead to oncogenic transformations of the cell are called
 - Proto - oncogenes
 - Cellular oncogenes
 - C-onc
 - All of these

A. **Answer.** (D) All of these

FEED BACK: Oncogenes / Proto - oncogenes/ cellular- oncogenes / C- onc are a group of genetic mutations that may cause cancer. They're a mutated form of genes that manage cell growth. When

these genes change into oncogenes, they cause cells to grow and divide uncontrollably. Oncogenes are powerful. Cancer typically happens when several genes mutate.

3. Assertion :Cancer cells are virtually immortal until the body in which they resides dies.

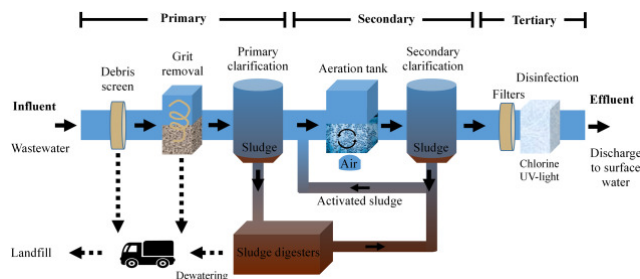
Reason: Cancer is caused by damage to genes regulating the cell division cycle.

- A. Both assertion and reason are true and the reason is the correct explanation for the assertion
- B. Both assertion and reason are true but the reason is not the correct explanation for the assertion
- C. Assertion is true but the reason is false
- D. Both the assertion and the reason are false

Answer. (A) Both assertion and reason are true and the reason is the correct explanation for the assertion

FEED BACK: Cancer is caused by damage to genes regulating the cell division cycle. It results due to an uncontrolled growth of the cells. The cancer cells show uncontrolled cell growth. They have lost cell differentiation ability. They also do not show contact inhibition. All these make the cancer cells immortal. Hence, these are virtually immortal until the body in which they resides dies.

Q.3: Observe the following figure showing a Sewage Treatment Plant and answer the given questions.



1. The purpose of biological treatment of waste water is to

- (a) Reduce BOD
- (b) Increase BOD
- (c) Reduce sedimentation
- (d) Increase sedimentation.

Answer : (a) Reduce BOD

FEED BACK : The more the water is polluted, the more will be the BOD, thus indicating more pollution in the water. This property is extensively used in sewage treatment plants; aerobic bacteria are introduced in the raw sewage water and these bacteria break down the organic pollutants present in it thus decomposing the raw sewage. This decreases the pollution level hence, decreasing the BOD of raw sewage.

2. Biochemical oxygen demand (BOD) in a river water

- (a) has no relationship with concentration of oxygen in the water
- (b) gives a measure of Salmonella in the water
- (c) increases when sewage gets mixed with river water
- (d) remains unchanged when algal bloom occurs.

Answer : (c) increases when sewage gets mixed with river water

FEED BACK: BOD in river water will increase if sewage gets mixed up with the river water because the organic matter will be added to the river. Sewage is wastewater having food residue, animal and human excreta, detergent, and discharges from industrial and commercial establishments.

3. Read the following statements and select the correct option

Statement 1: BOD represents the amount of dissolved oxygen that would be consumed if all the organic matter

in one litre of water were oxidised by microorganisms.

Statement 2: High value of BOD indicates that water is highly polluted by organic matter.

- (a) Both statements 1 and 2 are correct.
- (b) Statement 1 is correct but statement 2 is incorrect.
- (c) Statement 1 is incorrect but statement 2 is correct.
- (d) Both statements 1 and 2 are incorrect.

Answer : (a) Both statements 1 and 2 are correct.

FEED BACK: Biochemical oxygen demand (BOD) is the number of oxygen microorganisms take to decompose organic waste matter in water. It is therefore used as a measure of the number of certain types of organic pollutants in water. Biochemical oxygen demand or BOD is the amount of oxygen required to decompose organic matter in one liter of polluted water. If the water is polluted, more will be the BOD as more will be the organic matter present in it, and hence, more oxygen will be required to decompose it.