X

reviewer2@nptel.iitm.ac.in ▼

NPTEL

Courses » Introduction to Evolutionary Dynamics

Announcements   **Course**   Ask a Question   Progress

Unit 2 - Week 1

Course outline

How to access the portal?

Week 1

○ Lecture 1: History of the theory of Natural Selection – 1

○ Lecture 2: History of the theory of Natural Selection – 2

○ Lecture 3 : Exponential growth models

○ Lecture 4 : Logistic Growth Models – 1

○ Lecture 5 : Logistic Growth Models – 2

○ Quiz : Week 1 Assignment

○ Week 1 Assessment Solutions

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 1 Assignment

The due date for submitting this assignment has passed. **Due on 2017-08-07, 23:59 IST.**
As per our records you have not submitted this assignment.

1) Tick the event(s) in cellular evolution that allowed tremendous jump in cell's energy availability: *1 point*

☐ Evolution of the golgi

☐ Evolution of the nucleus

☐ Evolution of the cell wall

☐ Evolution of the mitochondria

No, the answer is incorrect.
Score: 0

Accepted Answers:
Evolution of the mitochondria

2) Who are the scientists credited with the development of the theory of natural selection?   *1 point*

☐ Charles Darwin

☐ Henry Bates

☐ Alfred Wallace

☐ Robert Malthus

No, the answer is incorrect.
Score: 0

Accepted Answers:
Charles Darwin
Alfred Wallace

3) What was Wallace and Darwin's common observation(s)?   *1 point*

☐ Non-random variations in species can be found everywhere

☐ None of the above

☐ Specific animal characteristics are linked to specific Geography.

☐ Fossils are smaller than the present animals

No, the answer is incorrect.
Score: 0

Accepted Answers:
Specific animal characteristics are linked to specific Geography.
Non-random variations in species can be found everywhere

4) Select the recently discovered phenomenon that challenges Darwin's ideas about evolution.   *1 point*

○ Horizontal Gene Transfer

○ DNA as a genetic material

○ Vertical gene transfer

○ Global warming

No, the answer is incorrect.
Score: 0

Accepted Answers:
Horizontal Gene Transfer

5) Bates found that some non-poisonous butterflies mimic the colourful patterns of poisonous   *1 point*
butterflies to avoid predators. Select true statement(s) about this phenomenon:

☐ It acted as an evidence for Darwin to exemplify the effects of Natural Selection.

☐ The discovery was made in the jungles of Amazon.

☐ It is called Batesian Mimickry.

☐ The discovery never got enough attention.

No, the answer is incorrect.
Score: 0

Accepted Answers:
It is called Batesian Mimickry.
It acted as an evidence for Darwin to exemplify the effects of Natural Selection.
The discovery was made in the jungles of Amazon.

6) What is generation time for a bacteria? Tick all correct.   *1 point*

☐ Time required for a cell to double its RNA.

☐ Time required for a cell to divide into two cells.

☐ Time required for a cell to grow to sufficient size in order to divide.

☐ Time required for a cell to duplicate its genome.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Time required for a cell to divide into two cells.
Time required for a cell to grow to sufficient size in order to divide.

7) Starting from exactly 2 cells, with cells dividing exactly after 30 minutes. How many cells will   *1 point*
be obtained in 4 hours?

○ 2048

○ 4096

○ 512

○ 1024

No, the answer is incorrect.
Score: 0

Accepted Answers:
512

8) Mass of a bacterial cell can be approximated as _____ x _____. Select from list below: *1 point*

○ Density of water, Volume of a sphere of radius 1 μm

○ Density of water, Volume of a sphere of radius 1 m

○ Density of Proteins and DNA, Density of water

○ Volume of a sphere of radius 1 μm, Density of DNA

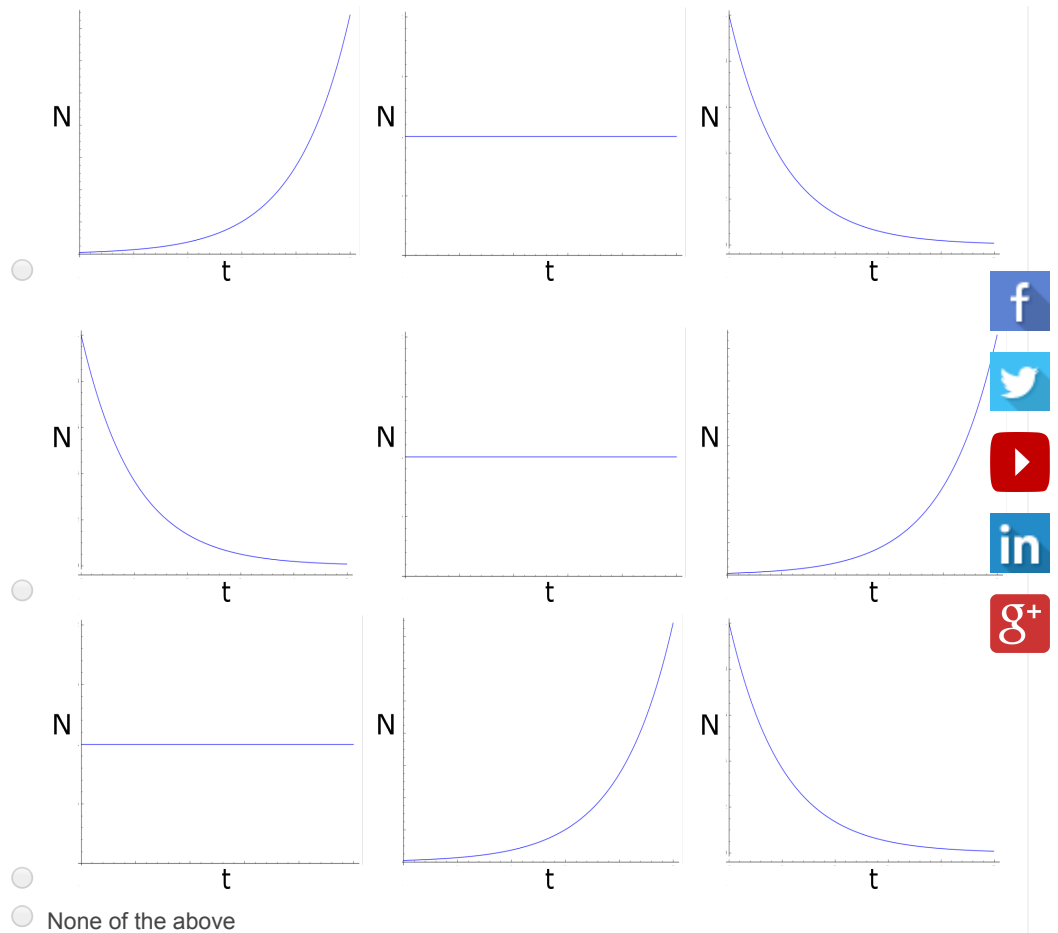**No, the answer is incorrect.**
Score: 0

Accepted Answers:
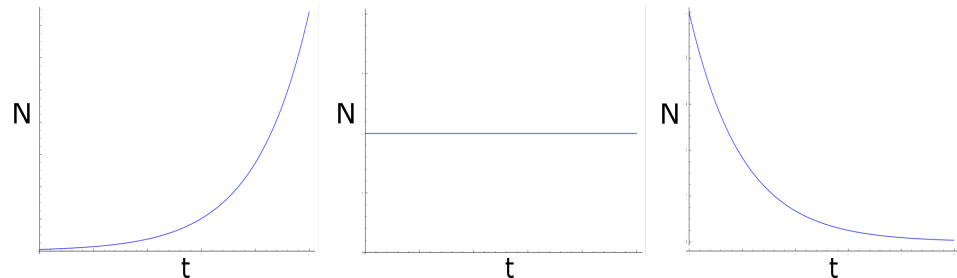*Density of water, Volume of a sphere of radius 1 μm*

9) What is the nature of population growth, when $r > d, r = d$, and $r < d$,   *1 point*
where r is the exponential growth rate of bacteria, and d is the death rate. Select correct
choice:

○

○

○ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:

10) What is the consequence of resource limitation? Tick all correct.   *1 point*

☐ Cells can grow only till the carrying capacity of the medium
☐ Increase in cell numbers cannot be modelled using simple exponential growth
☐ Bacteria can grow very fast
☐ Cells can keep growing indefinitely

No, the answer is incorrect.
Score: 0

Accepted Answers:
Cells can grow only till the carrying capacity of the medium
Increase in cell numbers cannot be modelled using simple exponential growth

11) When can $\frac{dN}{dt} = rN \cdot (1 - \frac{N}{K})$ be approximated as $i)\ rN$ and $ii)\ 0$?   *1 point*

○

$i)\ N \approx K\ \ and\ \ ii)\ N \ll K$

○

$i)\ N \ll K\ \ and\ \ ii)\ N \approx K$

○

$i)\ N = 0\ \ and\ \ ii)\ r = 0$

○ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
i) $N \ll K$ and ii) $N \approx K$

12.Solving the equation: $\frac{dN}{dt} = rN \cdot (1 - \frac{N}{K}) = 0$ gives us $N = 0$ and   **1 point**
$N = K$. What do the solutions of such an equation imply? Choose the correct answer

○ Gives the values of N, called unstable steady states.
○ No physical significance.
○ Gives the values of N, called stable steady states.
○ Gives us the values of N, where the rate of change of N is zero, the steady states.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Gives us the values of N, where the rate of change of N is zero, the steady states.

13.What is a stable steady state? Which of the two steady state conditions obtained, $N = 0$ **1 point**
and $N = K$, are steady? Select the correct answer.

○
The point from where any small perturbation causes the point to return to the same point is a stable steady state. $N = 0$ is a stable steady state.

○
The point from where any small perturbation causes the point to move away from the point is a stable steady state. $N = K$ is a stable steady state.

○
The point from where any small perturbation causes the point to return to the same point is a stable steady state. $N = K$ is a stable steady state.

○
The point from where any small perturbation causes the point to move away from the point is a stable steady state. $N = 0$ is a stable steady state.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The point from where any small perturbation causes the point to return to the same point is a stable stead
state. $N = K$ is a stable steady state.

14.Biologically relevant values of growth rate of the population (r) and carrying capacity of the   **1 point**
population (K) are $r \geq 0$ and $K > 0$? What is the justification? Tick all correct reasons.

☐
If $K < 0$, then the media can support only negative number populations, but population is defined
to be a positive quantity only.

☐
If $r = 0$, then population will not grow, but shrink, which means the organisms are dying.

☐
If $K = 0$, then the media can support a population of size 0, meaning it cannot support any life.

☐
If $r < 0$, then population will not grow, but shrink, which means the organisms are dying faster than
they are reproducing.

No, the answer is incorrect.
Score: 0

Accepted Answers:
If $r < 0$, then population will not grow, but shrink, which means the organisms are dying faster than they
are reproducing.
If $K < 0$, then the media can support only negative number populations, but population is defined to be a
positive quantity only.
If $K = 0$, then the media can support a population of size 0, meaning it cannot support any life.

15)$\frac{y^2}{4a} = x + k$, represents the equation of a _____.

1 point

○ Ellipse

○ Line

○ Hyperbola

○ Parabola

No, the answer is incorrect.
Score: 0

Accepted Answers:
Parabola

Previous Page

End

A project of

NPTEL National Programme on Technology Enhanced Learning

In association with

NASSCOM®

Funded by

Government of India
Ministry of Human Resource Development

Powered by

Google™