



BIOLOGY

BOOKS - NEW JYOTHI BIOLOGY (TAMIL ENGLISH)

EVOLUTION

Ncert Text Book Questions

1. Explain antibiotic resistance observed in bacteria in light of Darwinian selection theory.



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2. Find out from newspapers and popular science articles any new fossil discoveries or controversies about evolution.



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3. Attempt giving a clear definition of the term species.



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4. Try to trace the various components of human evolution (hint: brain size and function, skeletal structure, dietary preference, etc.



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5. Find out through internet and popular science articles whether animals other than man has self-consciousness.



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6. List 10 modern-day animals and using the internet resources link it to a corresponding ancient fossil. Name both.



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7. Practice drawing various animals and plants.



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8. Describe one example of adaptive radiation.



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9. Can we call human evolution as adaptive radiation?



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10. Using various resources such as your school library or the internet and discussions

with your teacher, trace the evolutionary stages of any one animal, say horse.



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New Evaluation Type Questions

1. To support the Big Bang theory, an experiment was done in 2008.
 - a. Name the experiment.
 - b. Where is it done?



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2. It is said the earth has formed about 4.5 billion years back. How did the earth crust and atmosphere formed according to Big Bang theory?

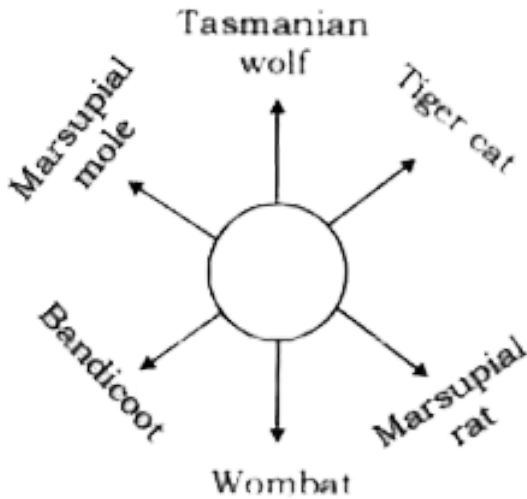


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3. It is possible to make a living cell with the help of methane, ammonia, water and hydrogen. Do you agree with this statement?



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4.

This is a type of adaptive radiation seen in one part of the world. a. Identify the type of adaptive radiation. Where. is it seen?

b. Give the difference between convergent evolution and divergent evolution.



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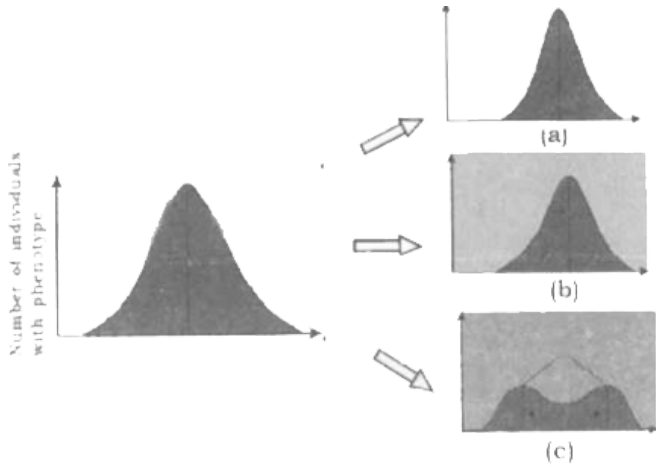
The above shown pictures are of a type of birds seen in the island near South America.

a. Identify the island.

b. What is the significance of these birds in evolution?



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6.

The diagrammatic representation shows the operation of natural selection. Give suitable heading for these curves.



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7. Give the names of

a. biggest reptile. b. first mammal

c. first fossil of human evolution. d. first fossil of horse evolution.



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8. Correct the flowchart of vertebrae's according to the geological period. Old to new.

Therapsids



Mammals

Mammals



Synapsids



Thecodonts



Pelycosaurs



Dinosaurs



Early reptiles



9. Find out the odd one in each group.

a. Cat's paw, insect wings, horse foot, bat's wing, human hand.

b. Industrial melanism, mutation, genetic drift, gene migration.

c. Vermiform appendix, plica semilunaris, spleen, pelvic girdle of python, cervical fistula.

d. Coenozoic, mesozoic, palaeozoic, proterozoic, holozoic

e. Isolation, recombination, genetic drift, gene

migration, natural selection, mutation, speciation.



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10. Give reasons for the following.

- a. Frog tadpole excretes ammonia, adult frog excretes urea.
- b. The chemical composition of DNA in almost all animals is similar.
- c. For energy production all animals depend upon glycolysis and Krebs's cycle

d. Connecting links play an important role in understanding the concept of organic evolution.

e. Change in germ cells is heritable.

f. Genetic drift is also known as bottle neck phenomenon.



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11. Birds are glorified reptiles. Justify the statement.



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12. Life has originated in sea water. Justify the statement.



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13. Archaeopteryx is considered as connecting link between birds and reptiles. Justify the statement by giving two characters of each group.



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14. Ontogeny recapitulates phylogeny. Discuss.



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15. Mention the role of cyanobacteria in origin of life.



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16. 'The universe had an explosive beginning'.

Which theory proposes this?



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17. There are many unusual organisms reported in Australia because of some special evolution. Mention the speciality of evolution that have occurred for the past 38 million years.



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18. Match the following related things from B and C with column A

Theory	Scientist	Ideas
a. Mutation theory	Lemaitre	Result of explosion
b. Big Bang theory	de Vries	Evolution is not a continuous process
c. Biogenesis	Aristotle	Life from non - living thing
d. Abiogenesis	Redi	Life from living thing



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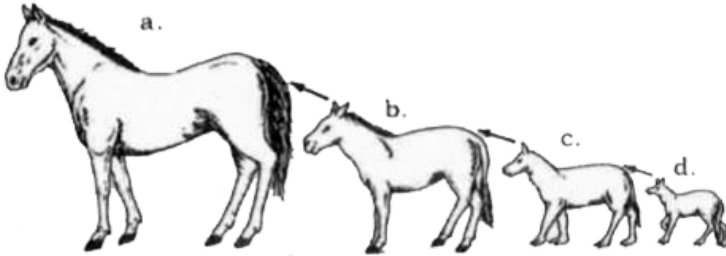
19. Match the following related things from B and C with Column A.

Era	Periods	Dominant life
a. Mesozoic era	Tertiary	Age of reptiles
b. Coenozoic era	Permian	Age of amphibian
c. Palaeozoic era	Jurassic	Age of mammals



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20. Identify the following figures.



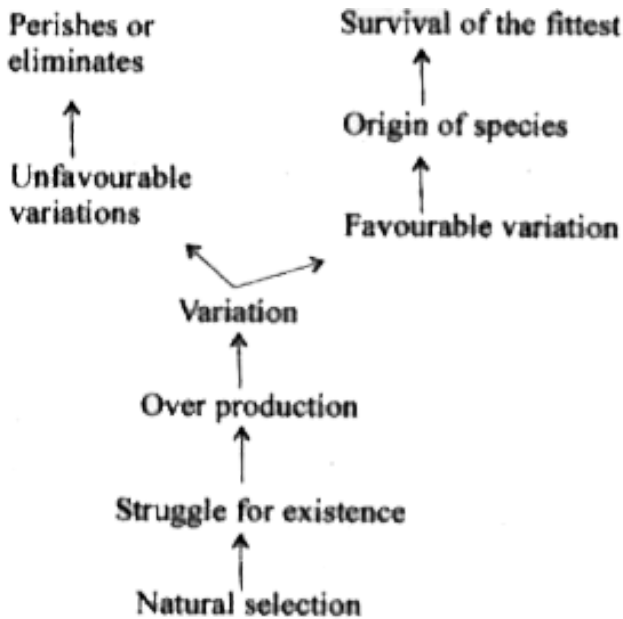
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21. The population of grey coloured *Biston betularia*, were almost replaced by the black variety during the industrial revolution in England. Explain the mechanism involved.



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22. Correct the following chart showing Darwinism.



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23. Aristotle believed that fishes originated from mud, insects from decaying meat, frog from moist soil etc. Do you agree with this statement? If no, give reason.



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24. Fossils are the written documents of evolution. Comment on it.



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25. Is there any population in Kerala having sickle cell anaemia? What is the reason of this genetic defect? Does it help the people in preventing any other diseases like malaria?



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A



B

26.

a. Identify the personalities shown above.

b. Briefly give about their contributions to evolution.



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27. National geographic channel selected you to interview Lamarck, the famous evolutionist.

Prepare some questions to be asked.



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28. Examine carefully the details given and group similar ones in table. Give suitable title for each column. Analyse the importance of each group in evolution.

Patagium of Draco, human hand, forelimb of rabbit, wings of bird, vermiform appendix, plica scmilunaris, wings of insects, whale's flipper, ear muscles.



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1. The given two pie diagrams show the population of *Biston betularia* (Grey) and *Biston betularia varcarbonaria* (Black) in industrial area of England during 1850's and 1950's.



a. What do you understand from the following pie diagrams?

Mention the evolutionary significance.



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Previous Year Hse Questions

1. Arrange the following in a hierarchical manner based on the period of their evolution.

Homoerectus, Ramapithecus,
Australopithecus, Homosapiens, Neanderthal
man



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2. Fill the columns A and B using the items given below.



(Lamarckism, Evolution by anthropogenic action, Gene flow b chance, Varieties of marsupials in Australia, de Vries)



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3. The diagrams shown below represent the operation of natural selection on different

traits. Observe the answer the following.



a. The graph C shows a marked difference from graph A. Why?

What is the evolutionary significance of directional selection?

Mention the factors affecting gene frequency.

What is meant by founder effect?



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[Previous Year Competitive Exam Questions Mcqs](#)

1. What are the constituents of Miller's experiment?

A. H_2O , NH_3 , H_2 , CH_4

B. NH_3 , H_2 , CH_4 , CO_2

C. CH_4 , NH_3

D. O_2 , N_2 , NH_4

Answer: A



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2. According to Oparin's theory which of the following gases were not present in the atmosphere



Answer: A



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3. Who said that organisms develop from pre-existing organisms?

A. Morgan

B. Louis Pasteur

C. Aristotle

D. Oparin

Answer: B



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4. Who performed an experiment to prove that organic compounds were the basis of life?

A. Oparin

B. Melvin

C. Calvin

D. Miller

Answer: D



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5. Which of the following scientists said that life originated from simple amino acids?

A. Oparin

B. Miller

C. Miller and Urey

D. de Vries

Answer: C



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6. The simple organic compounds that may have first evolved in the direction of origin are

A. proteins and nucleic acids

B. protein and aminoacids

C. urea and nucleic acids

D. urea and aminoacids

Answer: B



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7. Life cannot originate from inorganic material at present because

A. very low atmospheric pressure

B. high degree of environmental pollution

C. very high amount of oxygen in the atmosphere

D. absence of raw material

Answer: C



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8. The presence of salts (NaCl and other) in the animal body fluids gives an inference that life originated in

- A. rain water
- B. primitive ocean
- C. salt solution
- D. None of these

Answer: B



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9. Chemical theory of origin of life was given by

A. Stanley Miller

B. Oparin and Haldane

C. Louis Pasteur

D. Spallanzani

Answer: B



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10. Which of the following is vestigial organ in human?

A. Ear pinna

B. Nictitating membrane

C. Mammary glands in males

D. Knee bone

Answer: B



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11. Evolutionary convergence is characterised by

A. development of characteristics by random mating

B. replacement of common characteristics in different groups

C. development of dissimilar characteristics in closely related groups

D. development of a common set of characteristics in groups of different ancestry

Answer: D



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12. The mutations are mainly responsible for

A. constancy in organisms

B. variation in organisms

C. increasing the population rate

D. maintaining genetic continuity

Answer: B



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13. Speciation occurs when

A. population are reproductively isolated

B. population are isolated by geographical

barrier

C. Both the above

D. None of these

Answer: B



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14. Survival of the fittest and struggle for existence is related to

A. Lamarckism

B. Darwinism

C. Oparin theory

D. All above theories

Answer: B



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15. Homologous pairs of organs are

A. wings of birds, patagia of bat, legs of horse

B. flipper of whale, wings of grasshopper

C. wings of birds, wings of horse fly

D. All the above

Answer: A



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16. Lamarckism fails for the explanation

A. long neck of giraffe

B. loss of limbs in snakes

C. webbed digits of aquatic birds

D. None of these

Answer: C



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17. Reproductive isolation means

A. inability to interbreed

B. breed in isolation

C. ability to interbreed

D. breeding in a species

Answer: A



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18. The statement "Nothing in biology makes sense except in the light of evolution" was given by

A. Theodosius Dobzhansky

B. Charles Darwin

C. Alfred Russel Wallace

D. Joseph Hooker

Answer: A



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19. Archaeopteryx is the connecting link between

- A. fishes and amphibians
- B. amphibians and reptiles
- C. reptiles and birds
- D. aves and mammals

Answer: C



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20. The order in which horse evolution has occurred

A. Eohippus, Mesohippus, Merychippus and

Equus

B. Merychippus, Eohippus, Equus and

Mesohippus

C. Merychippus, Eohippus, Equus, and
Mesohippus

D. Equus, Mesohippus, Merychippus and
Eohippus

Answer: B



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21. Origin of life took place in the

A. Precambrian period

B. Cambrian period

C. Ordovician period

D. Silurian period

Answer: A



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22. Formation of most of the aminoacids as well as adenine and other nucleic acid bases from inorganic molecules was experimentally shown by

A. H.C.Urey and S.Miller

B. A.I.Oparin and J.B.S.Haldaene

C. Hugo De Vries

D. Spallanzani and L.Pasteur

Answer: A



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23. On the primitive earth, polymers such as proteins and nucleic acids in aqueous

suspension formed the spherical aggregates.

These are called

A. primitosomes

B. liposomes

C. primitogens

D. coacervates

Answer: B



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24. The jurassic period belongs to the era

A. Cenozoic

B. Mesozoic

C. Paleozoic

D. Proterozoic

Answer: B



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25. Name the antibiotic used in the Lederberg's replica planting experiment.

A. Erythromycin

B. Streptomycin

C. Penicillin

D. Neomycin

Answer: C



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26. Allopatric speciation occurs when

A. genetically related population inhabit
widely separated geographical area

B. genetically un-related populations
inhabit widely separated geographical
area

C. genetically related populations inhabit
the same geographical area

D. genetically un-related populations
inhabit the same geographical area

Answer: A



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27. The wings of bat and bird are

- A. homologous but not analogous
- B. analogous but not homologous
- C. both homologous and analogous
- D. neither homologous nor analogous

Answer: C



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28. Mesozoic era is known as the age of

A. fishes

B. amphibians

C. reptiles

D. molluscs

Answer: C



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29. Which one is not a vestigial organ?

A. Wings of Kiwi

B. Coccyx in man

C. Pelvic girdle of python

D. Flipper of seal

Answer: D



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30. Coacervates are

- A. colloidal droplets
- B. contain nucleoprotein
- C. a+b
- D. protobiont

Answer: C



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31. The theory of spontaneous generation or abiogenesis was disproved by

A. A.R. Wallace

B. Francisco Redi

C. Louis Pasteur

D. A.I. Oparin

Answer: B



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32. In a random mating populations in equilibrium which of the following brings about a change in gene frequency in a non - directional manner

A. Random drift

B. Selection

C. Migration

D. Mutation

Answer: A



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33. Which one of the following describes correctly the homologous structures?

A. Organs with anatomical dissimilarities,
but performing same function

B. Organs that have no function now, but
had an important function in ancestors

C. Organs appearing only in embryonic
stage and disappearing later in the adult

D. Organs with anatomical similarities, but performing different functions

Answer: D



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34. Industrial melanism is an example of

A. darkening of skin due to smoke from industries

B. protective resemblance with the surroundings

C. defensive adaptation of skin against ultraviolet radiations

D. drug resistance

Answer: B



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35. Ancestors of mammals

A. Ornithrischia

B. Theraspida

C. Silusidea

D. Chelonia

Answer: B



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36. Which of the following sets are vestigial structure in man?

A. Hair, Olecranon process, Coccyx and vermiform appendix

B. Wisdom tooth, mammary glands, coccyx and patella

C. Coccyx, nictitating membrane, appendix and ear muscles

D. Hair, ear ossicles, patella and atlas

Answer: C



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37. Geographic and reproductive isolation are most closely associated with

- A. speciation
- B. extinction
- C. overproduction
- D. competition

Answer: A



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38. Convert sequence of stages in evolution of modern man/Homo sapien sapien.

A. Australopithecus, Neanderthal man, Cro-Magnon man, Homo erectus and Modern man

B. Australopithecus, Homo erectus, Neanderthal man, Cro-Magnon man and Modern man

C. Homo erectus, Neanderthal man, Australopithecus, Cro-Magnon man and

Modern man

D. Homo erectus, Australopithecus,

Neanderthal man, Cro-Magnon man and

Modern man

Answer: B



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39. Two species which are morphologically almost identical but they do not interbreed.

Such species are called

A. evolutionary species

B. sibling species

C. polytypic species

D. evolutionary trend

Answer: B



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40. Select the pair that does not match.

A. Species are not immutable - Lamarck

B. Allopatric - Separated by space

C. Darwin's finches - Unique to Galapagos

D. Coacervates - Aggregates of organic
compounds bound by an organic
membrane

Answer: D



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41. Which is the correct Aristotle's ladder of nature?

A. Inanimate matter → lower plants → higher plants → zoophyta → entoma → ostracoderma → malacia → malacostraca → fish → oviparous quadrupeds → cetacea → birds → viviparous quadrupeds → humans

B. Inanimate matter → lower plants →
higher plants → zoophyta → entoma
→ malacia → malacostraca →
ostracoderma → fish → oviparous
quadrupeds → cetacean → birds
→ viviparous quadrupeds → humans

C. Inanimate matter → lower plants →
higher plants → zoophyta → malacia
→ malacostraca → ostracoderma
→ fish → oviparous → quadrupeds

→ cetacea → birds → viviparous

quadrupeds → humans

D. Inanimate matter → lower plants →

higher plants → zoophyta → entoma

→ ostracoderma → malacostraca

→ malacia → fish → cetacea →

oviparous quadrupeds → birds →

viviparous quadrupeds → humans

Answer: D



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42. Select the wrong pair.

A. Haldane - Hot dilute soup

B. Oparin - Protobiont

C. Fox - Coacervates

D. Spallanzani - Abiogenesis

Answer: D



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43. Which one of the following groups are not analogous organs?

A. Wings of birds and wings of butterfly

B. Eye of octopus and eye of mammals

C. Flippers of penguin and flippers of
dolphin

D. Thorns of bougainvilla and tendril of
cucurbita

Answer: D



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44. Hardy - Weinberg equilibrium is known to be affected by gene flow, genetic drift, mutation, genetic recombination and

A. evolution

B. limiting factors

C. saltation

D. natural selection

Answer: D



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45. Industrial melanism was highlighted by

- A. *Mimosa pudica*
- B. *Triticum aestivum*
- C. *Biston betularia*
- D. Rock python

Answer: C



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46. Which one of these is not a case of artificial selection?

A. Shetland pony

B. Great Dane dog

C. Broccoli

D. Peppered moth

Answer: D



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47. Amphibians were dominant during

A. Carboniferous

B. Silurian

C. Ordovician

D. Cambrian

Answer: A



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48. In the early, water CO_2 were produced by the combination of O_2 with

- A. Ammonia and methane
- B. Hydrogen
- C. Organic matter
- D. Sulphates and nitrates

Answer: A



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49. The primate which existed 15 mya among these was

- A. Homo habilis
- B. Australopithecines
- C. Ramapithecus
- D. Homo erectus

Answer: C



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50. Single step large mutation leading to speciation is also called

A. Founder effect

B. Saltation

C. Natural selection

D. Adaptive radiation

Answer: B



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