Evolution

Question1

Match List-I with List-II:

	List-I		List-II
A.	Gene pool	I	Stable within a generation
B.	Genetic drift	II	Change in gene frequency by chance
C.	Gene flow	III	Transfer of genes into or out of population
D.	Gene frequency	IV	Total number of genes and their alleles

Choose the correct answer from the options given below:

[NEET 2024 Re]

Options:

A.

A-III, B-II, C-I, D-IV

B.

A-IV, B-II, C-III, D-I

C.

A-I, B-II, C-III, D-IV

D.

A-II, B-III, C-IV, D-I

Answer: B

Solution:

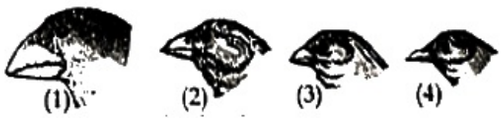
List-I		List-II	
A.	Gene pool	IV	Total number of genes and their alleles
B.	Genetic drift	II	When change in gene frequency occurs by chance
C.	Gene flow	III	When gene migration/transfer of genes into or out of population occurs multiple times.
D.	Gene frequency	I	According to Hardy Weinberg principle, gene frequency remains stable within generations.

Hence [A-IV, B-II, C-III, D-I] is the correct match.

Question2

Which evolutionary phenomenon is depicted by the sketch given in

figure?



[NEET 2024 Re]

Options:

A.

Artificial selection

B.

Genetic drift

C.

Convergent evolution

D.

Adaptive radiation

Answer: D

Solution:

The correct answer is option (4), because the evolutionary phenomenon depicted in the sketch is adaptive radiation as from the original seed-eating features, many other forms of finches with altered beaks arose, enabling them to become insectivorousand vegetarian finches.

Option (1) is incorrect because artificial selection is anthropogenic, where man breeds selected plants and animals for different uses.

Option (2) is incorrect because genetic drift is change in gene frequency by chance.

Option (3) is incorrect because convergent evolution is when different structures, with different origins evolve for the same function due to same habitat and hence have similarity. Darwin's finches are the example of divergent evolution.

Question3

Match List-I with List-II with respect to convergent evolution:

	List-I		List-II
A.	Lemur	I	Flying phalanger
B.	Bobcat	II	Numbat
C.	Anteater	III	Spotted cuscus
D.	Flying squirrels	IV	Tasmanian tiger cat

Choose the correct answer from the options given below:

[NEET 2024 Re]

Options:

A.

A-III, B-IV, C-II, D-I

B.

A-III, B-II, C-IV, D-I

C.

A-IV, B-III, C-II, D-I

D.

A-IV, B-II, C-III, D-I

Answer: A

Solution:

The correct answer is option (1), because

• Lemur is a placental mammal, shows convergent evolution with spotted cuscus which is an Australian marsupial.

• Bobcat is a placental mammal, shows convergent evolution with Tasmanian tiger cat which is an Australian marsupial.

• Anteater is a placental mammal, shows convergent evolution with Numbat which is an Australian marsupial.

• Flying squirrel is a placental mammal, shows convergent evolution flying Phalanger which is Australian marsupial.

Question4

Match List-I with List-II:

	List-I		List-II
A.	Living Fossil	I	Elongated canine teeth
B.	Connecting Link	II	Vermiform appendix
C.	Vestigial Organ	III	Echidna
D.	Atavism	IV	Latimeria

Choose the correct answer from the options given below:

[NEET 2024 Re]

Options:

A.

A-IV, B-III, C-II, D-I

B.

A-IV, B-II, C-III, D-I

C.

A-IV, B-III, C-I, D-II

D.

A-III, B-IV, C-I, D-II

Answer: A

Solution:

The correct answer is option (1) because:

• Latimeria is a living fossil, it is a bony fish, so (A) matches with (IV).

• Echidna is the connecting link between the reptiles and the mammals, so (B) matches with (III).

• Vestigial organs are remnants of organs which were complete and functional in the ancestral forms. The vermiform appendix of man is a vestigial organ. So, (C) matches with (II).

• Atavism is a trait of distant ancestors that reappears in the modern day, e.g., elongated canine teeth in humans. So, (D) matches with (I).

Options (2), (3) and (4) are incorrect as (A), (B), (C) and (D) have incorrect matches in them.

Question5

What is the correct order (old to recent) of periods in Paleozoic era?

[NEET 2024 Re]

Options:

A.

Silurian, Devonian, Permian, Carboniferous

B.

Silurian, Devonian, Carboniferous, Permian

C.

Permian, Devonian, Silurian, Carboniferous

D.

Silurian, Carboniferous, Permian, Devonian

Answer: B

Solution:

The correct answer is option (2) as the correct order (from old to recent) of periods in Paleozoic era is Silurian, Devonian, Carboniferous, Permian

• Option (1) is incorrect because Permian, is mentioned before (carboniferous).

• Option (3) is incorrect because it is mentioned that Permian is the oldest period of Paleozoic era.

• Option (4) is incorrect because it is mentioned that Devonian is the recent period of Paleozoic era.

Question6

The flippers of the Penguins and Dolphins are the example of the

[NEET 2024]

Options:

A.

Adaptive radiation

B.

Natural selection

C.

Convergent evolution

D.

Divergent evolution

Answer: C

Solution:

The correct answer is option (3), because the flippers of the Penguins and Dolphins perform similar function but they are not anatomically similar structures. This is example of analogous structures.

• Option (1) is incorrect as adaptive radiation is the process of evolution of different species in a given geographical area starting from a point and literally radiating to the other areas of geography.

• Option (2) is incorrect as natural selection is a key mechanism of evolution.

• Option (4) is incorrect as divergent evolution results in the formation of homologous structures.

Question7

Given below are some stages of human evolution.
Arrange them in correct sequence. (Past to Recent)
A. Homo habilis
B. Homo sapiens
C. Homo neanderthalensis
D. Homo erectus

Choose the correct sequence of human evolution from the options given below:

[NEET 2024]

Options:

A.

D-A-C-B

B.

B-A-D-C

C.

C-B-D-A

D.

A-D-C-B

Answer: D

Solution:

Correct answer is option (4) because the correct sequence of stages of human evolution from past to recent is

Homo habilis → Homo erectus → Homo neanderthalensis → Homo sapiens

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Question8

Match List I with List II:

	List-I		List-II
A.	Mesozoic Era	I.	Lower invertebrates
B.	Proterozoic Era	II.	Fish & Amphibia
C.	Cenozoic Era	III.	Birds & Reptiles
D.	Paleozoic Era	IV.	Mammals

Choose the correct answer from the options given below :

[NEET 2024]

Options:

A.

A-II, B-I, C-III, D-IV

B.

A-III, B-I, C-II, D-IV

C.

A-I, B-II, C-IV, D-III

D.

A-III, B-I, C-IV, D-II

Answer: D

Solution:

The correct answer is option no. (4)

A.	Mesozoic Era	III.	Birds & Reptiles
B.	Proterozoic Era	I.	Lower invertebrates
C.	Cenozoic Era	IV.	Mammals
D.	Paleozoic Era	II.	Fish & Amphibia

Question9

Identify the fossil of man who showed the following characteristics.
(A) Brain capacity of 1400cc
(B) Used hides to protect their body
(C) Buried their dead bodies

In the light of above statements, choose the correct answer from the options given below :
[NEET 2023 mpr]

Options:

A.

Homo erectus

B.

Neanderthal man

C.

Homo habilits

D.

Australopithecus

Answer: B

Solution:

Solution:

Option A : Homo erectus - Homo erectus was an early human species that existed around 1.9 million to 110,000 years ago. They were the first of the hominins to leave Africa and spread across parts of Europe and Asia. They had a larger brain size compared to earlier human ancestors (with an average capacity of about 900 - 1100 cc), used more complex tools, and were likely able to control fire.

Option B : Neanderthal man - Neanderthals are an extinct species of hominids that lived between about 400,000 and 40,000 years ago in Europe and southwestern to central Asia. They had a brain capacity equal to or slightly larger than that of modern humans, with an average of about 1200 - 1750 cc. They made and used a diverse set of sophisticated tools, controlled fire, lived in shelters, made and wore clothing, were skilled hunters of large animals and also ate plant foods, and occasionally made symbolic or ornamental objects. There is evidence that Neanderthals deliberately buried their dead and occasionally even marked their graves with offerings.

Option C : Homo habilis - Homo habilis is an early human species that lived between approximately 2.1 and 1.5 million years ago. It is considered one of the earliest members of the Homo genus and had a larger brain than earlier hominins, averaging around 650 - 800 cc. They also manufactured primitive tools, giving them their name 'handy man'.

Option D : Australopithecus - Australopithecus is a genus of hominins that lived between about 4 and 2 million years

ago. They had a smaller brain size (average around 400 - 500 cc) and were more similar to apes in terms of their physical characteristics. Some species of Australopithecus are considered direct ancestors of the Homo genus. Fossil evidence suggests they walked upright, but it's unclear how much they used tools.

Question10

Select the correct group/set of Australian Marsupials exhibiting adaptive radiation.
[NEET 2023]

Options:

A. Numbat, Spotted cuscus, Flying phalanger

B. Mole, Flying squirrel, Tasmanian tiger cat

C. Lemur, Anteater, Wolf

D. Tasmanian wolf, Bobcat, Marsupial mole

Answer: A

Solution:

Solution:

Option (1) is the correct answer because numbat, spotted cuscus and flying phalanger are Australian marsupials exhibiting adaptive radiation.

Option (2) is incorrect because mole and flying squirrel are placental mammals.

Option (3) is incorrect because lemur and wolf are placental mammals.

Option (4) is incorrect because bobcat is a placental mammal

Question11

Select the correct statement regarding mutation theory of evolution.
[NEET Re-2022]

Options:

A. Large differences due to mutations arise gradually in a population

B. This theory was proposed by Alfred Wallace

C. Variations are small directional changes

D. Single step large mutation is a cause of speciation

Answer: D

Solution:

Solution:

- Mutation theory was given by Hugo de Vries.
- Mutation is the large difference arising suddenly in population.

- Mutations are random and directionless.

Question12

Panspermia, an idea that is still a favourite for some astronomers, means
[NEET Re-2022]

Options:

A. Transfer of spores as unit of life from other planets to Earth

B. Creation of life from dead and decaying matter

C. Creation of life from chemicals

D. Origin of sperm in human testes

Answer: A

Solution:

Solution:

Early Greek thinkers thought units of life called spores were transferred to different planets including Earth, which formed the Theory of Panspermia.

Question13

Natural selection where more individuals acquire specific character value other than the mean character
value, leads to
[NEET-2022]

Options:

A. Stabilising change

B. Directional change

C. Disruptive change

D. Random change

Answer: B

Solution:

Option (2) is correct because in directional natural selection more individuals acquire value other than the mean character value.

Option (3) is incorrect because in disruptive change, more individuals acquire peripheral character value at both ends of the distribution curve.

Option (4) is incorrect because there is no random change in natural selection.

Option (1) is incorrect because natural selection leads to stabilisation when more individuals acquire mean character value.

Question14

Which of the following statements is not true? [NEET-2022]

Options:

A. Analogous structures are a result of convergent evolution

B. Sweet potato and potato is an example of analogy

C. Homology indicates common ancestry

D. Flippers of penguins and dolphins are a pair of homologous organs

Answer: D

Solution:

Solution:

Option (4) is the correct answer because flippers of penguins and dolphins are analogous organs as they help in swimming but do not have the same structure.

Option (3), (1) and (2) are true statements and hence cannot be the correct answer.

Homologous organs have the same structure but have different functions according to the needs of the organisms. Hence, homology indicates common ancestry Analogous structures have developed for the same function but do not show a similarity in structure.

Hence, they are a result of convergent evolution.

Sweet potato is a root modification for food storage whereas potato is an underground stem modification for storage. Hence they are analogous.

Question15

The factor that leads to Founder effect in a population is : [NEET 2021]

Options:

A. Natural selection

B. Genetic recombination

C. Mutation

D. Genetic drift

Answer: D

Solution:

• Change in gene frequency in a small population by chance is known as genetic drift. Genetic drift has two ramifications, one is bottle neck effect and another is founder's effect.

• When accidentally a few individuals are dispersed and act as founders of a new isolated population, founder's effect is said to be observed.

• Crossing over which occurs during gamete formation results in genetic recombination.

• Mutations are random and directionless.

Question16

Match List - I with List - II

	List-I		List-II
(a)	Adaptive radiation	(i)	Selection of resistant varieties due to excessive use of herbicides and pesticides
(b)	Convergent evolution	(ii)	Bones of forelimbs in Man and Whale
(c)	Divergent evolution	(iii)	Wings of Butterfly and Bird
(d)	Evolution by anthropogenic action	(iv)	Darwin Finches

Choose the correct answer from the options given below.

[NEET 2021]

Options:

A. (a)-(iv) (b)-(iii) (c)-(ii) (d)-(i)

B. (a)-(i) (b)-(ii) (c)-(iii) (d)-(iv)

C. (a)-(ii) (b)-(iii) (c)-(i) (d)-(iv)

D. (a)-(iv) (b)-(ii) (c)-(i) (d)-(iii)

Answer: A

Solution:

Solution:

The correct option is (1)

● Adaptive radiation is the process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography, for example : Darwin's finches.

● Analogous organs which are not anatomically similar structures though they perform similar functions, are a result of convergent evolution, for example: Wings of butterfly and of birds.

● Homologous organs which are anatomically similar structures but perform different functions according to their needs, are a result of divergent evolution, for example : Bones of forelimbs in man and whale.

● Evolution by anthropogenic action means evolution due to human interference, for example: Antibiotic resistant microbes, herbicides resistant varieties and pesticide resistant varieties.

Question17

From his experiments, S.L. Miller produced amino acids by mixing the following in a closed flask
[NEET-2020]

Options:

A. CH_3, H_2, NH_4 and water vapor at 800°C

B. CH_4, H_2, NH_3 and water vapor at 600°C

C. CH_3, H_2, NH_3 and water vapor at 600°C

D. CH_4, H_2, NH_3 and water vapor at 800°C

Answer: D

Solution:

Solution:

In 1953, S.L. Miller, an American scientist created electric discharge in a closed flask containing CH_4,H_2,NH_3 and water vapor at 800°C.

Question18

Flippers of Penguins and Dolphins are examples of
[NEET-2020]

Options:

A. Convergent evolution

B. Industrial melanism

C. Natural selection

D. Adaptive radiation

Answer: A

Solution:

Solution:

The correct option is (1) because flippers of Penguins and Dolphins are an example of analogous organs. Analogous structures are a result of convergent evolution.

Question19

Which of the following refer to correct example(s) of organisms which have evolved due to changes in environment brought about by

anthropogenic action?
(a) Darwin’s Finches of Galapagos islands.
(b) Herbicide resistant weeds.
(c) Drug resistant eukaryotes.
(d) Man-created breeds of domesticated animals like dogs.
[NEET-2020]

Options:

A. (a) and (c)

B. (b), (c) and (d)

C. Only (d)

D. Only (a)

Answer: B

Solution:

Solution:

The correct option is (2) because :

• Herbicide resistant weeds, drug resistant eukaryotes and man-created breeds of domesticated animals like dogs are examples of evolution by anthropogenic action.

• Darwin's Finches of Galapagos islands are example of natural selection, adaptive radiation and founder's effect.

Question20

A population of a species invades a new area. Which of the following condition will lead to Adaptive Radiation?
[NEET OD 2019]

Options:

A. Area with large number of habitats having very low food supply

B. Area with a single type of vacant habitat

C. Area with many types of vacant habitats

D. Area with many habitats occupied by a large number of species

Answer: C

Question21

In Australia, marsupials and placental mammals have evolved to share many similar characteristics. This type of evolution may be referred to as :

[NEET OD 2019]

Options:

A. Adaptive Radiation

B. Divergent Evolution

C. Cyclical Evolution

D. Convergent Evolution

Answer: D

Question22

In a species, the weight of newborn ranges from 2 to 5 kg. 97% of the newborn with an average weight between 3 to 3.3 kg survive whereas 99% of the infants born with weights from 2 to 2.5 kg or 4.5 to 5 kg die. Which type of selection process is taking place?
[NEET 2019]

Options:

A. Stabilizing Selection

B. Disruptive Selection

C. Cyclical Selection

D. Directional Selection

Answer: A

Solution:

Solution:

The given data shows stabilising selection as most of the newborn having average weight between 3 to 3.3 kg survive and babies with less and more weight have low survival rate.

Question23

Which of the following statements is correct about the origin and evolution of men?.
[NEET OD 2019]

Options:

A. Agriculture came around 50,000 years back.

B. The Dryopithecus and Ramapithecus primates existing 15 million years ago, walked like men.

C. Homo habilis probably ate meat.

D. Neanderthal men lived in Asia betweeen 1, 00, 000 and 40,000 years back.

Answer: D

Question24

A gene locus has two alleles A, a. If the frequency of dominant allele A is 0.4, then what will be the frequency of homozygous dominant, heterozygous and homozygous recessive individuals in the population? [NEET 2019]

Options:

A. 0.16(AA); 0.24(Aa); 0.36(aa)

B. 0.16(AA); 0.48(Aa); 0.36(aa)

C. 0.16(AA); 0.36(Aa); 0.48(aa)

D. 0.36(AA); 0.48(Aa); 0.16(aa)

Answer: B

Solution:

Solution:

Frequency of dominant allele (say p) = 0.4

Frequency of recessive allele (say q) = 1 – 0.4 = 0.6

∴ Frequency of homozygous dominantindividuals (AA)

$= p^2 = (0.4)^2 = 0.16$

Frequency of heterozygous individuals (Aa)

$= 2pq = 2(0.4)(0.6) = 0.48$

Frequency of homozygous recessiveindividuals (aa)

$= q^2 = (0.6)^2 = 0.36$

Question25

Match the hominids with their correct brain size : (a) Homo habilis

(a) Homo habilis	(i) 900 cc
(b)Homo neanderthalensis	(ii) 1350 cc
(c) Homo erectus	(iii) 650-800 cc
(d) Homo sapiens	(iv) 1400 cc

Select the correct option.
(a) (b) (c) (d)
[NEET 2019]

Options:

A. (iii) (ii) (i) (iv)

B. (iii) (iv) (i) (ii)

C. (iv) (iii) (i) (ii)

D. (iii) (i) (iv) (ii)

Answer: B

Solution:

Solution:

The correct match of hominids and their brain sizes are :

Homo habilis — 650-800 cc

Homo neanderthalensis — 1400 cc

Homo erectus — 900 cc

Homo sapiens — 1350 cc

Question26

Variations caused by mutation, as proposed by Hugo de Vries are
[NEET 2019]

Options:

A. random and directionless

B. small and directional

C. small and directionless

D. random and directional

Answer: A

Solution:

According to Hugo de Vries, mutations are random and directionless.

Devries believed mutation caused speciation and hence called saltation (single step large mutation).

Question27

According to Hugo de Vries, the mechanism of evolution is [NEET 2018]

Options:

A. Multiple step mutation

B. Saltation

C. Minor mutations

D. Phenotypic variations

Answer: B

Solution:

Solution:

As per mutation theory given by Hugo de Vries, the evolution is a discontinuous phenomenon or saltatory phenomenon/ saltation.

Question28

Among the following sets of examples for divergent evolution, select the incorrect option: [NEET 2018]

Options:

A. Forelimbs of man, bat and cheetah

B. Heart of bat, man and cheetah

C. Eye of octopus, bat and man

D. Brain of bat, man and cheetah

Answer: C

Solution:

Solution:

Divergent evolution occurs in the same structure, example - forelimbs, heart, brain of vertebrates which have developed along different directions due to adaptation to different needs whereas eye of octopus, batand man are examples of analogous organs showing convergent evolution.

Question29

The similarity of bone structure in the forelimbs of many vertebrates is an example of
[NEET 2018]

Options:

A. Homology

B. Analogy

C. Adaptive radiation

D. Convergent evolution

Answer: A

Solution:

Solution:

In different vertebrates, bones of forelimbs are similar but their forelimbs are adapted in different way as per their adaptation, hence example of homology.

Question30

Genetic drift operates in
[NEET 2016 P2]

Options:

A. slow reproductive population

B. small isolated population

C. large isolated population

D. non-reproductive population

Answer: B

Solution:

Solution:

Genetic drift operates in small isolated population

Question31

In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by
[NEET 2016 P2]

Options:

A. q2

B. p2

C. 2pq

D. pq

Answer: C

Solution:

Solution:

In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by 2pq

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Question32

The chronological order of human evolution from early to the recent is [NEET 2016 P2]

Options:

A. Australopithecus → Homo habilis → Ramapithecus → Homo erectus

B. AustraloPithecus → Ramapithecus → Homo habilis → Homo erectus

C. Ramapithecus → Australopithecus → Homo habilis → Homo erectus

D. Ramapiihecus → Homo habilis → Australopithecus → Homo erectus

Answer: C

Solution:

Solution:

The chronological order of human evolution from early to the recent is

Ramapithecus → Australopithecus → Homo habilis → Homo erectus

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Question33

Which of the following is the correct sequence of events in the origin of life?
I. Formation of protobionts
II. Synthesis of organic monomers
III. Synthesis of organic polymers
IV. Formation of DNA-based genetic systems
[NEET 2016 P2]

Options:

A. II, III, IV, I

B. II, III, IV

C. I, III, II, IV

D. II, III, I, IV

Answer: D

Solution:

Solution:

The correct sequence of events in the origin of life is Synthesis of organic monomers – Synthesis of organic polymers – Formation of protobionts –Formation of DNA-based genetic systems

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Question34

Which of the following structures is homologus to the wing of a bird ? [NEET 2016 P1]

Options:

A. Flipper of Whale

B. Dorsal fin of the Shark

C. Wing of a Moth

D. Hind limb of Rabbit

Answer: A

Question35

Analogous structures are a result of : [NEET 2016 P1]

Options:

A. Stabilizing selection

B. Convergent evolution

C. Divergent evolution

D. Shared ancestry

Answer: B

Solution:

Analogous structures have the same function but are evolved from a common ancestor. They are the result of the convergent evolution that different organisms shared a common environment. Convergent evolution describes the independent evolution of similar features in species of different lineages. The two species came to the same function, flying, but did so separately from each other. They have "converged" on this useful trait.

Question36

Following are the two statements regarding the origin of life :
(a) The earliest organisms that appeared on the earth were non-green and presumably anaerobes.
(b) The first autotrophic organisms were the chemoautotrophs that never released oxygen. Of the above statements which one of the following options is correct ?
[NEET 2016 P1]

Options:

A. Both (a) and (b) are false

B. (a) is correct but (b) is false

C. (b) is correct but (a) is false

D. Both (a) and (b) are correct.

Answer: D

Solution:

Solution:

First originated organism was prokaryote chemoheterotroph and oxygen was not available on earth at that time so it must be anaerobic too. Even the first autotroph was dependent on chemicals so oxygen is not released

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Question37

The wings of a bird and the wings of an insect are
(2015)

Options:

A. phylogenetic structures and represent divergent evolution

B. homologous structures and represent convergent evolution

C. homologous structures and represent divergent evolution

D. analogous structures and represent convergent evolution

Answer: D

Solution:

Analogous organs are the organs which have similar function but are different in their structural details and origin. The analogous structures are the result of convergent evolution. The wings of an insect are analogous to wings of a bird because the basic structure of the wings of the insects is different from the wings of bird. However, their function is similar.

Question38

Industrial melanism is an example of (2015)

Options:

A. mutation

B. Neo-Lamarckism

C. Neo-Darwinism

D. natural selection

Answer: D

Solution:

Solution:
Natural selection is the most widely accepted theory concerning the principal causal mechanism of evolutionary change profounded by Charles Darwin and Alfred Russel Wallace. It results from the differential reproduction (some members of a population produce abundant offspring, some only a few and still others none), one phenotype as compared with other phenotypes in the same population. This determines the relative share of different genotypes which individuals possess and propagate in a population. Industrial melanism supports evolution by natural selection. It is an adaptation where the moths living in the industrial areas developed melanin pigments to match their bodies to the tree trunks.

Question39

A population will not exist in Hardy - Weinberg equilibrium if : [NEET 2015 C]

Options:

A. There are no mutations

B. There is no migration

C. The population is large

D. Individuals mate selectively

Answer: D

Question40

Which is the most common mechanism of genetic variation in the population of sexually reproducing organism?
[NEET 2015 C]

Options:

A. Chromosomal aberrations

B. Genetic drift

C. Recombination

D. Transduction

Answer: C

Solution:

Solution:

Question41

Which of the following had the smallest brain capacity ?
[NEET 2015 C]

Options:

A. Homo sapiens

B. Homo neanderthalensis

C. Homo habilis

D. Homo erectus

Answer: C

Question42

In a population of 1000 individuals 360 belong to genotype AA, 480 to Aa and the remaining 160 to a a, Based on this data, the frequency of allele A in the population is :
[NEET 2014]

Options:

A. 0.4

B. 0.5

C. 0.6

D. 0.7

Answer: C

Solution:

According to Hardy Weinberg principle.
$p^2 + 2pq + q^2 = 1$; $(p + q)^2 = 1$
(AA)p^2 = 360 out of 1000 individual or p^2 = 36 out of 100
q^2 = 160 out of 1000 or q^2 = 16 out of 100
so $q = \sqrt{.16} = .4$.As $p + q = 1$
so,p is 0.6

Question43

Forelimbs of cat, lizard used in walking; forelimbs of whale used in swimming and forelimbs of bats used in flying are an example of: [NEET 2014]

Options:

A. Analogous organs

B. Adaptive radiation

C. Homologous organs

D. Convergent evolution

Answer: C

Solution:

Solution:
Forelimbs of cat, lizard used in walking, forelimbs of whale used in swimming and forelimbs of bats used in flying are the examples of homologous. All are modified forelimbs, with the same types of bones, they have become different due to adaptation to habitat

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Question44

Which one of the following are analogous structures? [NEET 2014]

Options:

A. Wings of Bat and Wings of Pigeon

B. Gills of Prawn and Lungs of Man

C. Thorns of Bougainvillea and Tendrils of Cucurbita

D. Flippers of Dolphin and legs of Horse

Answer: A

Solution:

Solution:
Wings of bat are skin folds stretched mainly between elongated finger but the wings of birds are a feather covering all along the arm. They look similar because they have a common use for flying, but their origin are not common. This makes them analogous characteristics rather than homologous characteristics.

Question45

According to Darwin, the organic evolution is due to (NEET 2013)

Options:

A. competition within closely related species

B. reduced feeding efficiency in one species due to the presence of interfering species

C. intraspecific competition

D. interspecific competition

Answer: D

Solution:

Solution:
According to Darwin, the organic evolution is due to interspecific competition. Interspecific competition is a form of competition in which individuals of different species compete for the same resource in an ecosystem (while intraspecific competition involved organisms of the same species). In interspecific competition, the individuals of different species having similar requirements like food, air, water and shelter etc. compete with each other.
Darwin proposed the model of interspecific competition as the motive force of organic evolution. This model derived its explanatory power from the fact that the different organisms were familiar with the industrial and social completion of which many characteristic features could be grasped and compared with biological phenomena without formal

demonstration or proof.

Question46

The tendency of population to remain in genetic equilibrium may be disturbed by
(NEET 2013)

Options:

A. lack of mutations

B. lack of random mating

C. random mating

D. lack of migration

Answer: B

Solution:

Solution:
Hardy-Weinberg law states that allele frequencies in a population are stable and remain constant from generation to generation when there is random and non-selective mating. In case of lack of random mating, genetic equilibrium may be disturbed.

Question47

Variation in gene frequencies within populations can occur by chance rather than by natural selection. This is referred to as
(NEET 2013)

Variation in gene frequencies within populations can occur by chance rather than by natural selection. This is referred to as
(NEET 2013)

Options:

A. random mating

B. genetic load

C. genetic flow

D. genetic drift

Answer: D

Solution:

Solution:
Genetic drift (Sewall Wright effect) is the random change in the frequency of alleles in a population over successive generations in the gametes. Each new generation differs from its parental generation with regard to allele frequencies simply because of random variation in the distribution of gametes. This process is more rapid in smaller populations, or when the alleles concerned confer no apparent benefit compared to their counterparts.

Question48

The process by which organisms with different evolutionary history evolve similar phenotypic adaptations in response to a common environmental challenge, is called
(NEET 2013)

Options:

A. non-random evolution

B. adaptive radiation

C. natural selection

D. convergent evolution

Answer: D

Solution:

Solution:
Convergent evolution is the development of superficially similar structures in unrelated organisms, usually because the organisms live in the same kind of environment. Examples are the wings of insects and birds and the streamlined bodies of whales and fish. One can say that it is the similar habitat that has resulted in selection of similar adaptive features in different groups of organisms but toward the same function. An example of convergent evolution is the similar nature of the flight/wings of insects, birds, pteridosaurs, and bats. All four serve the same function and are similar instructure, but each evolved independently. Some species of the lens of eyes also evolved independently in various animals.

Question49

The eye of octopus and eye of cat show different patterns of structure, yet they perform similar function. This is an example of
(NEET 2013)

Options:

A. analogous organs that have evolved due to convergent evolution.

B. analogous organs that have evolved due to divergent evolution.

C. homologous organs that have evolved due to convergent evolution.

D. homologous organs that have evolved due to divergent evolution

Answer: A

Solution:

Solution:
The eye of octopus and eye of cat show different patterns of structure, yet they perform similar functions. This is an example of analogous organs.
Analogous organs have evolved due to convergent evolution. Analogous organs have developed in the evolutionary process through adaptation of quite different organisms to similar mode of life

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Question50

Random unidirectional change in allele frequencies that occurs by chance in all populations and especially in small populations is known as
(KN NEET 2013)

Options:

A. migration

B. natural selection

C. genetic drift

D. mutation

Answer: C

Solution:

Solution:
Genetic drift is random change in allele number and frequency in a gene pool due to chance (e.g., small size of population). It is caused by sampling error or error in gene pool sample that is to form the next generation. The sampling gene pool is generally small in size. Variability is also limited.

Question51

Genetic variation in a population arises due to
(KN NEET 2013)

Options:

A. recombination only

B. mutation as well as recombination

C. reproductive isolation and selection

D. mutations only

Answer: B

Solution:

Solution:
The genetic variations exist due to reshuffling of genes caused by recombinations or by mutations. The recombinations are produced by the routine reshuffling of genes during independent assortment of chromosomes, reciprocal crossing of genes during crossing over and random fertilization of gametes. Mutation is the sudden inheritable discontinuous variation which appears in an organism due to permanent changes in its genotype. Mutation can occur at any stage during the development. Mutations are heritable changes, that is, if they appear in somatic cells they are inherited to daughter cells by mitosis but if they appear in gamete cells they are inherited to the offsprings. The former are known as somatic mutations and latter as germ mutations. They bring about a change in the genetic message and cause variation.

Question52

Dinosaurs dominated the world in which of the following geological eras?
(KN NEET 2013)

Options:

A. Cenozoic

B. Jurassic

C. Mesozoic

D. Devonian

Answer: C

Solution:

Solution:
The Mesozoic Era is the age of dinosaurs.

Question53

The finch species of Galapagos islands are grouped according to their food sources. Which of the following is not a finch food?
(KN NEET 2013)

Options:

A. Carrion

B. Insects

C. Tree buds

D. Seeds

Answer: A

Solution:

Solution:
Darwin's finches show adaptive radiation. This radiation occurred in response to various food resources available. These finches feed on insects, tree buds, seeds, cactus etc. Carrion are dead bodies and no finches feed on them.

Question54

Evolution of different species in a given area starting from a point and spreading to other geographical areas is known as (2012)

Options:

A. adaptive radiation

B. natural selection

C. migration

D. divergent evolution

Answer: A

Solution:

Solution:
Adaptive radiation (divergent evolution) is the evolution from one species of animals or plants of a number of different forms. As the original population increases in size it spreads out from its centre of origin to exploit new habitats and food sources. In time, this results in a number of populations each adapted to its particular habitat, eventually these populations will differ from each other sufficiently to become new species.

Question55

Which one of the following options gives one correct example each of convergent evolution and divergent evolution? (2012)

	Convergent evolution	Divergent evolution
(a)	Eyes of octopus and mammals	Bones of forelimbs of vertebrates
(b)	Thorns of Bougainvillea and tendrils of Cucurbita	Wings of butterflies and bird
(c)	Bones of forelimbs of vertebrates	Wings of butterfly and birds
(d)	Thorns of Bougainvillea and tendrils of Cucurbita	Eyes of octopus and mammals

(2012)

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: A

Solution:

Solution:
Development of similar adaptive functional structures in unrelated groups of organisms is called convergent evolution. It shows analogy. Examples are wings of butterfly and birds, eye of the octopus and the mammals, flippers of penguins \& dolphins, etc. On the other hand, divergent evolution involves development of different functional structures along different directions due to adaptations to different needs from a common ancestral form. For example, forelimbs of vertebrates (whales, bat, cheetah, human). Though these perform different functions, they have similar anatomical structures.

Question56

What was the most significant trend in the evolution of modern man (Homo sapiens) from his ancestors? (2012,2011)

Options:

A. Shortening of jaws

B. Binocular vision

C. Increasing cranial capacity

D. Upright posture

Answer: C

Solution:

The most significant trend in the evolution of modern man (Homo sapiens) from the ancestors is increasing brain capacity. The human species developed a much larger brain than that of other primates—typically 1,330 cm^3 in modern humans, over twice the size of that of a chimpanzee or gorilla.

Question57

The extinct human who lived 1,00,000 to 40,000 years ago, in Europe, Asia and parts of Africa, with short stature, heavy eye brows, retreating fore heads, large jaws with heavy teeth, stocky bodies, a lumbering gait and stooped posture was (2012)

Options:

A. Homo habilis

B. Neanderthal human

C. Cro-magnon human

D. Ramapithecus

Answer: B

Solution:

Solution:
(b) Neanderthals are an extinct species or subspecies of archaic humans who lived in Eurasia until about 40,000 years ago. They probably went extinct due to competition with or extermination by immigrating European early modern humans or due to great climatic change, disease, or a combination of these factors.

Question58

The idea of mutations was brought forth by (Mains 2012)

Options:

A. Hugo de Vries who worked on evening primrose

B. Gregor Mendel who worked on Pisum sativum

C. Hardy Weinberg who worked on allele frequencies in a population

D. Charles Darwin who observed a wide variety of organisms during sea voyage.

Answer: A

Solution:

The term mutation was coined by Hugo de Vries (1901) for large spontaneous inheritable changes which occur suddenly in naturally reproducing population. He also proposed mutation theory of evolution in his book "The Mutation Theory" published in 1903 in which he put forth that evolution occurred due to large discontinuous variations. He worked on Oenothera lamarckiana or evening primrose. During his experiments he found 834 mutations in a population of 54343 plants. It was later on found that the mutations observed by Hugo de Vries were actually chromosomal aberrations.

Question59

Darwin's finches are a good example of (2010, 2008)

Options:

A. industrial melanism

B. connecting link

C. adaptive radiation

D. convergent evolution

Answer: C

Solution:

Solution:
Darwin finches a good example of adaptive radiation. Adaptive radiation is a process of evolution of different species in a given geographical area starting from a point and radiating to other areas of geography

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Question60

Given below are four statements (A-D) each with one or two blanks. Select the option which correctly fills up the blanks in two statements.
Statements:
(A) Wings of butterfly and birds look alike and are the results of ___(i)___ evolution.
(B) Miller showed that CH_4, H_2, NH_3 and ___(i)___ when exposed to electric discharge in a flask resulted in formation of ___(ii)___
(C) Vermiform appendix is a ___(i)___ organ and an ___(ii)___ evidence of evolution.
(D) According to Darwin evolution took place due ___(i)___ and ___(ii)___ of the fittest.
(Mains 2010)

Options:

A. (D) − (i) small variations, (ii) survival,
(A) − (i) convergent

B. (A) − (i) convergent,
(B) − (i) oxygen, (ii) nucleosides

C. (B) − (i) water vapour,(ii) amino acids(ii) anatomical
(C) − (i) rudimentary,

D. (C) − (i) vestigial, (ii) anatomical
(D) − (i) mutations, (ii) multiplication

Answer: A

Question61

The most apparent change during the evolutionary history of Homo sapiens is traced in
(Mains 2010)

Options:

A. loss of body hair

B. walking upright

C. shortening of the jaws

D. remarkable increase in the brain size

Answer: D

Solution:

Solution:
The most apparent change during evolutionary history of modern man (Homo sapiens) is the increase in the brain size. The brain capacity gradually increased from early human ancestors. Homo habilis had $650 - 800$ c.c. brain capacity which increased to 900 c.c. in Homo erectus. The true men including the living modern man also displayed the gradual increase in cranial size. The neanderthal man had 1400cc brain capacity which evolved to around 1450 c.c. ($1300 - 1600$ c.c.) in living modern man (Homo sapiens sapiens).

Question62

Peripatus is a connecting link between
(2009)

Options:

A. mollusca and echinodermata

B. annelida and arthropoda

C. coelenterata and porifera

D. ctenophora and platyhelminthes

Answer: B

Solution:

Solution:
Peripatus belongs to phylum onychophora. It shows characters of annelids as well as arthropods. Owing to its resemblance with two different phyla, Peripatus is often referred to as connecting link between them. This shows an important morphological and anatomical evidence of evolution.

Question63

In the case of peppered moth (Biston betularia) the black-coloured form became dominant over the light-coloured form in England during industrial revolution. This is an example of
(2009)

Options:

A. appearance of the darker coloured individuals due to very poor sunlight

B. protective mimicry

C. inheritance of darker colour character acquired due to the darker environment

D. natural selection whereby the darker forms were selected

Answer: D

Solution:

Solution:
During post industrialisation period the tree trunk became dark due to industrial smoke and soots.
White winged moths did not survive due to predators and dark winged moths survived because they were less easily seen by them against a dark background. Thus industrial melanism supports evolution by natural selection that favours the establishment of one particular advantageous mutation within a population.

Question64

Which one of the following scientist's name is correctly matched with the theory put forth by him?
(2008)

Options:

A. De Vries - Natural selection

B. Mendel - Theory of Pangenesis

C. Weismann - Theory of continuity of germplasm

D. Pasteur - Inheritance of acquired characters

Answer: C

Solution:

Solution:
Theory of continuity of germplasm was put forward by August Weismann. According to this, the characters influencing the germ cells are only inherited. There is a continuity of germ plasm but the somataplasm is not transmitted to the next generation hence it doesn't carry characters to next generation.

Question65

Which one of the following is incorrect about the characteristics of protobionts (coacervates and microspheres) as envisaged in the abiogenic origin of life?
(2008)

Options:

A. They were partially isolated from the surroundings.

B. They could maintain an internal environment

C. They were able to reproduce.

D. They could separate combinations of molecules from the surroundings.

Answer: C

Solution:

Solution:
The condition for origin of life, partial isolation, has been attained within aggregates of artificially formed prebiotic molecules. These aggregates are called protobionts which can separate combinations of molecules from the surroundings. They maintain an internal environment but are unable to reproduce. Two important protobionts are coacervates and microspheres.

Question66

Thorn of Bougainvillea and tendril of Cucurbita are examples of
(2008)

Options:

A. vestigial organs

B. retrogressive evolution

C. analogous organs

D. homologous organs

Answer: D

Solution:

Solution:
The organs which have the same fundamental structure but are different in function are called homologous organs. Thorn of Bougainvillea and tendril of Cucurbita both arises in the axillary position, but have different functions.

Question67

Which one of the following statements is correct? (2007)

Options:

A. There is no evidence of the existence of gills during embryogenesis of mammals.

B. All plant and animal cells are totipotent.

C. Ontogeny repeats phylogeny.

D. Stem cells are specialized cells

Answer: C

Solution:

Solution:
Haeckel (1810) proposed that developing animal embryo passes through stages resembling adult forms of its ancestors. Earnst Haeckel (1868,1874) formulated biogenetic law or racapitulation theory which states that ontogeny (developmental history of an individual) repeats phylogeny (development history of races).

Question68

The concept of chemical evolution is based on (2007)

Options:

A. interaction of water, air and clay under intense heat

B. effect of solar radiation on chemicals

C. possible origin of life by combination of chemicals under suitable environmental conditions

D. crystallization of chemicals

Answer: C

Solution:

Solution:
Chemical evolution has two meanings and uses. The first refers to the theories of evolution of the chemical elements in the universe through nucleosynthesis. The second use of chemical evolution or chemosynthesis is as a hypothesis to explain how life might possibly have developed or evolved from non-life.

Question69

The Finches of Galapagos islands provide an evidence in favour of (2007)

Options:

A. evolution due to mutation

B. retrogressive evolution

C. biogeographical evolution

D. special creation

Answer: C

Solution:

Solution:
Biogeographical evolution is a process in which gene pool of a population gradually changes in response to environmental pressures, natural selection and genetic mutations.

Question70

When two species of different genealogy come to resemble each other as a result of adaptation, the phenomenon is termed (2007)

Options:

A. microevolution

B. co-evolution

C. convergent evolution

D. divergent evolution

Answer: C

Solution:

The analogous organs show convergent evolution due to similar adaptions which do not support organic evolution.

Question71

Adaptive radiation refers to
(2007)

Options:

A. evolution of different species from a common ancestor

B. migration of members of a species to different geographical areas

C. power of adaptation in an individual to a variety of environments

D. adaptations due to geographical isolation

Answer: A

Solution:

Solution:
Adaptive radiation refers to evolution of different species from a common ancestor. The mammals are adapted for different mode of life i.e. they show adaptive radiation. They can be aerial (bat), aquatic (whale and dolphins), burrowing or fossorial (rat), cursorial (horse), scantorial (squarrel) or arboreal (monkey). The adaptive radiation, the term by osborn, is also known as Divergent evolution.

Question72

An important evidence in favour of organic evolution is the occurrence of
(2006)

Options:

A. homologous and analogous organs

B. homologous and vestigial organs

C. analogous and vestigial organs

D. homologous organs only

Answer: B

Solution:

Homologous organ and vestigial organs provide an important evidence in favour of organic evolution (process by which changes in the genetic composition of populations of organisms occur in response to environmental changes). For example, human appendix is a developmental derivative and evolutionary vestige of the end of the much larger herbivorous caecum found in our primate ancestors. They both are structurally homologous and have different functions. In most vertebrates, the caecum is a large, complex gastrointestinal organ, enriched in mucosal lymphatic tissue and specialized for digestion of plants. The caecum varies in size among species, but in general the size of the caecum is proportional to the amount of plant matter in a given organism's diet. It is largest in obligate herbivores, animals whose diets consist entirely of plant matter. However, even though humans are herbivorous, the small human caecum does not house cellulose-digesting bacteria, and lost an essential function of cellulose digestion. This shows the close evolutionary relationships between homologous and vestigial organs.

Question73

Which of the following amino acids was not found to be synthesized in Millers's experiment?
(2006)

Options:

A. Alanine

B. Glycine

C. Aspartic acid

D. Glutamic acid

Answer: D

Solution:

Solution:
Stanley Miller in 1953, who was then a graduate student of Harold Urey at the University of Chicago, circulated four gases - methane, ammonia, hydrogen and water vapour in an air tight apparatus and passed electrical discharges from electrodes. He passed the mixture through a condenser. He circulated the gases continuously in this way for one week and then analysed the chemical composition of the liquid inside the apparatus. He found a large number of simple organic compounds including some amino acid such as alanine, glycine and aspartic acid. Glutamic acid was not found.

Question74

Jurassic period of the mesozoic era is characterised by
(2006)

Options:

A. flowering plants and first dinosaurs appear

B. gymnosperms are dominant plants and first birds appear

C. radiation of reptiles and origin of mammal like reptiles

D. dinosaurs become extinct and angiosperms appear

Answer: B

Solution:

Solution:
Jurassic period of mesozoic era is characterised by gymnosperms as dominant plant and the appearance of first toothed bird. Conifers, cycads and ferns were widespread.

Question75

Praying mantis is a good example of (2006)

Options:

A. camouflage

B. mullerian mimicry

C. warning colouration

D. social insects

Answer: A

Solution:

Solution:
Praying mantis shows the phenomenon of camouflage by blending itself into the background. This enables it to elude predators.

Question76

Which one of the following experiments suggests that simplest living organisms could not have originated spontaneously from non-living matter? (2005)

Options:

A. Larvae could appear in decaying organic matter.

B. Microbes did not appear in stored meat.

C. Microbes appeared from unsterilized organic matter.

D. Meat was not spoiled, when heated and kept sealed in a vessel

Answer: D

Solution:

Solution:
Microbes were killed by heating the meat and the sealed vessel formed a closed system wherein the new microbes could not come in contact with the nutrient medium and hence no spoilage of meat.

Question77

De Vries gave his mutation theory on organic evolution while working on
(2005)

Options:

A. Pisum sativum

B. Drosophila melanogaster

C. Oenothera lamarckiana

D. Althea rosea

Answer: C

Solution:

Solution:
Pisum sativum - Mendel
Drosophila melanogaster - T. H. Morgan.
Hugo de Vries (1901) put forward a theory of evolution, called mutation theory. The theory states that evolution is a jerky process where new varieties and species are formed by mutations (= sports or discontinuous variations) that function as raw material of evolution.

Question78

There are two opposing views about origin of modern man. According to one view Homo erectus in A sia were the ancestors of modern man. A study of variation of DNA however suggested African origin of modern man. What kind of observation on DNA variation could suggest this?
(2005)

Options:

A. Greater variation in Asia than in Africa

B. Greater variation in Africa than in Asia

C. Similar variation in Africa and Asia

D. Variation only in Asia and no variation in Africa

Answer: B

Solution:

Solution:
According to Neodarwinism variation is the root cause of evolution.

Question79

Which one of the following phenomena supports Darwin's concept of natural selection in organic evolution?
(2005)

Options:

A. Development of transgenic animals

B. Production of 'Dolly', the sheep by cloning

C. Prevalence of pesticide resistant insects

D. Development of organs from 'stem cells' for organ transplantation

Answer: C

Solution:

Solution:
According to Darwin's theory of survival of the fittest (Natural selection), the organisms which are provided with favourable variations would survive, because they are the fittest to face their surroundings, while the unfit are destroyed. Darwin considered that useful variations are transmitted to the offspring and appear more prominently in succeeding generations. After some generations these continuous and gradual variations in the possessor would be so distinct that they form a new species. This is proved by, the pesticide resistant insects that have the ability to survive as they have resistance genes and so they are selected by nature. Other insects lacking these genes will be killed by pesticides.

Question80

Which of the following is the relatively most accurate method for dating of fossils?
(2005)

Options:

A. Radio-carbon method

B. Potassium-argon method

C. Electron-spin resonance method

D. Uranium-lead method

Answer: C

Solution:

Solution:
Electron spin resonance (ESR) measures the number of charges occupying deep traps in the crystal bandgap. By measuring the change in absorption of microwave energy within a continuously varying strong magnetic field, this method detects the number of "unpaired spins" of electronic charges trapped at various defects in the mineral lattice. The principle of ESR dating is that radiation damage occurs in minerals as a result of uranium uptake, and external effects. This damage is usually repaired in living tissue, but in dead tissue it accumulates. If the method of uptake can be judged, then the approximate age of the tissue can be deduced from the extent of the radiation damage.

Question81

At a particular locus, frequency of A allele is 0.6 and that of a is 0.4. What would be the frequency of heterozygotes in a random mating population at equilibrium?
(2005)

Options:

A. 0.36

B. 0.16

C. 0.24

D. 0.48

Answer: D

Solution:

Solution:
In a stable population, for a gene with two alleles, A (dominant) and a (recessive), if the frequency of A is p and the frequency of a is q, then the frequencies of the three possible genotypes (AA, Aa, and aa) can be expressed by the given HardyWeinberg equation:
$p^2 + 2pq + q^2 = 1$
where p^2 = frequency of AA (homozygous dominant) individuals, $2pq$ = frequency of Aa (heterozygous) individuals, and q^2 = frequency of aa (homozygous recessive) individuals. The equation can be used to calculate allele frequencies if the numbers of homozygous recessive individuals in the population is known.
The equation and the equilibrium are named after British mathematician G.H. Hardy and German physician W. Weinberg.
So $p = 0.6$ and $q = 0.4$ (given)
$2pq$ (frequency of heterozygote)
$= 2 \times 0.6 \times 0.4 = 0.48$

Question82

Which of the following is not true for a species?
(2005)

Options:

A. Members of a species can interbreed.

B. Gene flow does not occur between the populations of a species.

C. Each species is reproductively isolated from every other species.

D. Variations occur among members of a species.

Answer: B

Solution:

Solution:
Species may be defined as an uniform interbreeding population or group of individuals which freely interbreed among themselves. Gene flow occurs between populations of a species by gene migration i . e., emigration and immigration.

Question83

Age of fossils in the past was generally determined by radio-carbon method and other methods involve radioactive elements found in the rocks. More precise methods, which were used recently and led to the revision of the evolutionary periods for different groups of organisms, includes
(2004)

Options:

A. study of carbohydrates/proteins in fossils

B. study of the conditions of fossilization

C. electron spin resonance (ESR) and fossil DNA

D. study of carbohydrates / proteins in rocks.

Answer: C

Solution:

Solution:
ESR, Electron Spin Resonance measures number of charges occupying deep traps in crystal band gap.
Electron Paramagnetic Resonance (EPR) or Electron Spin Resonance (ESR) is a spectroscopic technique which detects

species that have unpaired electrons, generally meaning that the molecule in question is a free radical if it is an organic molecule, or that it has transition metal ions if it is an inorganic complex. Because most stable molecules have a closed-shell configuration without a suitable unpaired spin, the technique is less widely used than nuclear magnetic resonance (NMR). The EPR was first discovered in Kazan State University by Soviet physicist Yevgeniy Zavoyskiy in 1944

Question84

What kind of evidence suggested that man is more closely related with chimpanzee than with other hominoid apes?
(2004)

Options:

A. Evidence from DNA extracted from sex chromosomes only

B. Comparison of chromosomes morphology only

C. Evidence from fossil remains, and the fossil mitochondrial DNA alone

D. Evidence from DNA extracted from sex chromosomes, autosomes.

Answer: D

Solution:

Solution:
Apes are the members of the hominoidea superfamily of primates, which includes humans. Under the current classification system there are two families of hominoids:

- The family hylobatidae consists of 4 genera and 13 species of gibbons, including the Lar Gibbon and the Siamang, collectively known as the "lesser apes"
- The family hominidae consisting of orangutans, gorillas, chimpanzees, and humans, collectively known as the "great apes".

Within the superfamily Hominoidea, gibbons are the outgroup: this means that the rest of the hominoids are more closely related to each other than any of them are to gibbons. Investigation showed orangutans to be the outgroup, but comparing humans to all three other hominid genera showed that African apes (chimpanzees and gorillas) and humans are more closely related to each other than any of them are to orangutans.
How ever, DNA comparisons from sex chromosomes and autosomes provide convincing evidence that within the subfamily homininae, gorillas are the outgroup. This suggests that chimpanzees should be in hominini along with humans.

Question85

Which one of the following is a living fossil?
(2004)

Options:

A. Cycas

B. Moss

C. Saccharomyces

D. Spirogyra

Answer: A

Solution:

Solution:
Cycas and Ginkgo are often considered as the living fossil because they are one of the few representative of once a large group of plants (which was once a well flourished group) and possess traits of extinct pteridosperms and other gymnosperms.

Question86

According to Oparin, which one of the following was not present in the primitive atmosphere of the earth?
(2004)

Options:

A. Methane

B. Oxygen

C. Hydrogen

D. Water vapour

Answer: B

Solution:

Solution:
The first scientific explanation of origin of life was put forward by a Russian Scientist, A.I. Oparin in 1923. J.B.S. Haldane (1928), England-born Indian Scientist, also made similar observations regarding the origin of life. According to them primitive atmosphere was reducing atmosphere because hydrogen atoms (most numerous and most reactive) combined with all available oxygen atoms to form water and leaving no free oxygen.

Question87

Diversification in plant life appeared
(2004)

Options:

A. due to long periods of evolutionary changes

B. due to abrupt mutations

C. suddenly on earth

D. by seed dispersal.

Answer: A

Solution:

Solution:
Diversification in plant life appeared due to long periods of evolutionary changes. Initially plants were thalloid. There were no differentiation among root, stem and leaves. Vascular tissues were absent.

Question88

Convergent evolution is illustrated by (2003)

Options:

A. rat and dog

B. bacterium and protozoan

C. starfish and cuttle fish

D. dogfish and whale.

Answer: D

Solution:

Solution:
Convergent evolution is the formation of similar traits by unrelated groups of organisms. Dogfish and whale are the interesting examples of convergent evolution in animals as both of them have more or less similar body organization.

Question89

Which one of the following sequences was proposed by Darwin and Wallace for organic evolution? (2003)

Options:

A. Overproduction, variations, constancy of population size, natural selection

B. Variations, constancy of population size, overproduction, natural selection

C. Overproduction, constancy of population size, variations, natural selection

D. Variations, natural selection, overproduction, constancy of population size

Answer: C

Solution:

The gist (in brief) of Darwin - Wallace theory is as follows.
(i) Individuals within species show considerable but continuous variation in the form and physiology.
(ii) This variation arises in a random fashion and is heritable.
(iii) The potential for increase within population of animals and plants is considerable.
(iv) since resources are limited, so individuals in a population struggle for their own existence.
(v) Only some survive and leave offsprings with the same trait - through this natural selection of the fittest species become represented by individuals which are better adapted.

Question90

Random genetic drift in a population probably results from (2003)

Options:

A. highly genetically variable individuals

B. interbreeding within this population

C. constant low mutation rate

D. large population size.

Answer: B

Solution:

Solution:
Interbreeding is the breeding between two different closely associated species where as intra breeding is the breeding among the same species.
Genetic drift can cause elimination of certain allleles or fixation of the other allleles in the population.
So, the correct option is 'Interbreeding within small population'

Question91

Industrial melanism is an example of (2003)

Options:

A. drug resistance

B. darkening of skin due to smoke from industries

C. protective resemblance with the surroundings

D. defensive adaptation of skin against ultraviolet radiations.

Answer: C

Solution:

Industrial melanism is an adaptation where the moths living in the industrial areas developed melanin pigments to match their body to the sootcovered surroundings. These melanic forms are mainly distributed in and around large industrial cities, where the environment has been altered by the pollution of the atmosphere; and is manifested by the appearance of dark colour of lichen-covered tree trunks, on which the moths rest during the day time. The peppered moth exists in two strains (forms) : light coloured (white) and melanic (black). In the past, bark of trees was covered by whitish lichens, so white moths escaped unnoticed from predatory birds. After industrialization barks got covered by smoke, so the white moths were selectively picked up by birds. But black moths escaped unnoticed so they managed to survive resulting in more population of black moths and less population of white moths.

Question92

In a random mating population in equilibrium, which one of the following brings about a change in gene frequency in a non-directional manner?
(2003)

Options:

A. Mutations

B. Random drift

C. Selection

D. Migration

Answer: B

Solution:

Solution:
In a random mating population in equilibrium, random drift brings about a change in gene frequency in a non-directional manner. Random drift is a non-directional factor. In actual practice, the gene frequencies due to random drift may approach to limits, i.e., 0 and 1. This would be possible only when new population arises due to a very small sample leading to the fixation of one allele at the cost of other. In this manner the changes in the gene frequency can be brought about without the existence of any directional force i.e. mutation, selection and migration and this change in gene frequency has been called random genetic drift.

Question93

Darwin in his "Natural Selection Theory" did not believe in any role of which one of the following in organic evolution?
(2003)

Options:

A. Parasites and predators as natural enemies

B. Survival of the fittest

C. Struggle for existence

D. Discontinuous variations

Answer: D

Solution:

Solution:
The theory of natural selection is based on the following factors:
(i) Rapid multiplication and limited food and space which leads to struggle for existence.
(ii) Struggle for existence and variations which leads to natural selection or survival of the fittest.
(iii) Natural selection and inheritance of useful variation over many generation which leads to formation of new species.
Darwin in his "Natural Selection Theory" did not believe in the role of discontinuous variation in natural selection. Darwin always believed in the universal occurrence of variation. In his opinion, variation is continuous in nature. Darwin did not understand the cause of variation and assumed it was one of the innate properties of living things. Now it is known that variation is due to mutation and thus it may be discontinuous.

Question94

Which one of the following describes correctly the homologous structures?
(2003)

Options:

A. Organs with anatomical similarities, but performing different functions

B. Organs with anatomical dissimilarities, but performing same function

C. Organs that have no function now, but had an important function in ancestor

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

Answer: A

Solution:

Solution:
Those organs which have a common origin and are built on the same anatomical pattern, but perform different functions and are modified accordingly.

Question95

Which one of the following is categorised under living fossils?
(2003)

Options:

A. Pinus

B. Cycas

C. Selaginella

D. Metasequoia

Answer: B

Question96

Cause of mimicry is
(2002)

Options:

A. concealment

B. offence

C. defence

D. both (b) and (c).

Answer: D

Solution:

Solution:
Mimicry is specially evolved primarily for concealment and protection. Concealment itself may prove to be defensive and may also help in offence. Mimicry is defined as the resemblance of one organism to another or to any natural object.

Question97

Which of the following is most important for speciation?
(2002)

Options:

A. Seasonal isolation

B. Reproductive isolation

C. Behavioural isolation

D. Tropical isolation

Answer: B

Solution:

The phenomenon of development of a new species from pre-existing one is called speciation. Reproductive isolation is the prevention of interbreeding between the populations of two different species. It maintains the characters of the species but can lead to the origin of new species.

Question98

Which of the following are homologous organs? (2002)

Options:

A. Wings of birds and locust

B. Wings of birds and pectoral fins of fish

C. Wings of bat and butterfly

D. Legs of frog and cockroach

Answer: B

Solution:

Solution:
Homologous organs have same basic structure and origin but they differ in their external appearance and function

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Question99

Genetic drift operates in (2002)

Options:

A. small isolated population

B. large isolated population

C. fast reproductive population

D. slow reproductive population.

Answer: A

Solution:

Genetic drift is a change in gene frequency in successive generation of a small population due to chance alone rather than natural selection or gene transfer. The effect of genetic drift on a small population is large as compared to that in the larger population which, owing to its large size and a large number of gametes produced, has a greater probability to accurately represent the allelic frequency of a parental population. An isolated population rules out the possibility of gene flow.

Question100

There is no life on moon due to the absence of (2002)

Options:

A. O_2

B. water

C. light

D. temperature.

Answer: B

Solution:

Solution:
Water is the most essential material to survive. One can thrive without O_2 (anaerobic bacteria) and light and in a wide range of temperature but one cannot live without water which is the most important component of the body (about 90% of plasma consists of water) and life was originated from abiogenetic materials in water.

Question101

According to fossils discovered up to present time origin and evolution of man started from (2002)

Options:

A. France

B. Java

C. Africa

D. China

Answer: C

Solution:

Solution:
The common ancestor of both ape and man is Dryopithecus - a 20 million years old fossil discovered from Africa. Austroalopithecus also lived in Africa between 6 million to 1 million years ago. The genus Homo evolved 2 million years ago from one of such Australopithecines in Africa and then only moved out of the continent.
The first such Homo lived throughout Asia, some parts of Europe and Africa. But obviously its evolution took place in Africa.

Question102

In which condition, the gene ratio remains constant for any species population?
(2002)

Options:

A. Sexual selection

B. Random mating

C. Mutation

D. Gene flow

Answer: B

Solution:

Solution:
Allele frequency in a population can remain constant only if individuals of the population randomly interbreed. Generally it never happens in nature and species populations exist in small groups of randomly breeding subpopulations. Thus allele frequency between two subpopulations may differ but allele frequency within the subpopulation will remain constant. Such subpopulations are termed Mendelian populations or deme. Exchange of genes between demes takes place occasionally, Mutation, gene flow (due to migration), etc. may te change the allele frequency of the subpopulation.

Question103

Sequence of which of the following is used to know the phylogeny?
(2002)

Options:

A. m RNA

B. rRNA

C. t RNA

D. DNA

Answer: B

Solution:

Solution:
Carl Woese came up with the theory of life based on his discovery that the genes encoding ribosomal RNA are ancient and distributed over all lineages of life with little or no gene transfer. Therefore, r RNA are commonly recommended as molecular clocks to the phylogeny.

Question104

In which era reptiles were dominant? (2002)

Options:

A. Coenozoic era

B. Mesozoic era

C. Palaeozoic era

D. Archaeozoic era

Answer: B

Solution:

Solution:
Mesozoic era is the era during which reptiles were dominant. It includes three periods : Triassic (240 million years ago), Jurassic (195 million years ago) and Cretaceous (135 million years ago). Origin of dinosaurs occurred during triassic period. During Jurassic period, lizards, crocodiles and alligators originated. Dinosaurs became large and reptiles were dominant during this period. During cretaceous period, dinosaurs got extinct.

Question105

Which statement is correct about centre of origin of plant? (2001)

Options:

A. More diversity in improved variety

B. Frequency of dominant gene is more

C. Climatic condition more favourable

D. None of the above

Answer: B

Solution:

Solution:
The two criteria on basis of which Nikolai Ivanwitch Vavilov proposed different centre of origin were (a) occurrence of maximum variation in the crop and (b) occurrence of wild relatives.

Question106

Half life period of C^{14} is (2001)

Options:

A. 500 years

B. 5000 years

C. 50 years

D. 5×10^4 years.

Answer: B

Solution:

Solution:
^{14}C has a half life of 5570 years and is used in radio carbon dating. Carbon in living things contains a uniform amount of radioactive ^{14}C produced constantly in the atmosphere. From the amount of ^{14}C in the dead sample, the age of the organism can be determined.

Question107

Most abundant organic compound on earth is (2001)

Options:

A. protein

B. cellulose

C. lipids

D. steroids

Answer: B

Solution:

Cellulose is a polysaccharide. It is formed by the linkage of beta 1,4 linkage of the glucose unit. It is an important component of the cell wall of the plant. It is used for the production of paper. It does not have free aldehyde group so they are non reducing sugar. It is a fibrous polysaccharide as it exists in form of long chain-like structure and is mainly found in plants and most abundant organic compound on earth.

Question108

Similarities in organism with different genotype indicates (2001)

Options:

A. microevolution

B. macroevolution

C. convergent evolution

D. divergent evolution

Answer: C

Solution:

Solution:
Convergent evolution is the process whereby organisms not closely related, independently evolve similar traits as a result of having to adapt to similar environments or ecological niches. Common examples are microbats, toothed whales and shrews developed sonar-like echolocation systems used for orientation, obstacle avoidance and for locating prey. Several groups of ungulates have independently reduced or lost side digits on their feet, often leaving one or two digits for walkingSo, the correct answer is 'Convergent evolution'

Question109

Reason of diversity in living being is (2001)

Options:

A. mutation

B. long term evolutionary change

C. gradual change

D. short term evolutionary change

Answer: B

Solution:

The organisms which are provided with favourable variations would survive, because they are the fittest to face their surroundings, while the unfit are destroyed. Darwin considered that useful variations are transmitted to the offspring and appear more prominently in succeeding generations. After some generations these continuous and gradual variations in the possessor would be so distinct that they form a new species.

Question110

Which of the following is closest relative of man? (2001)

Options:

A. Chimpanzee

B. Gorilla

C. Orangutan

D. Gibbon

Answer: A

Solution:

Solution:
Chimpanzees are closest living relatives to the humans and share more than 98 percent of genetic blueprint as humans and chimpanzees shared a common ancestor, who lived some four to eight million years ago. Hence, option A is the correct answer.

Question111

Which of the following is correct order of the evolutionary history of man? (2001)

Options:

A. Peking man →homo sapiens→ Neanderthal man→ Cromagnon man

B. Peking man→ Neanderthal man→ Heidelberg man→ Cromagnon man

C. Peking man→ Heidelberg man→ Neanderthal man→ Cromagnon man

D. Peking man→ Neanderthal man→ Homo sapiens→ Heidelberg man

Answer: C

Solution:

Peking man, extinct hominin of the species Homo erectus, known from fossils found at Zhoukoudian near Beijing. They lived between 750,000 and 200,000 years ago.
Homo heidelbergensis is an extinct species or subspecies of archaic humans in the genus Homo, which radiated in the Middle Pleistocene from about 700,000 to 300,000 years ago.
Neanderthals are an extinct species or subspecies of archaic humans in the genus Homo, who lived within Eurasia from circa 400,000 until 40,000 years ago.
Cro-Magnons had powerful bodies, which were usually heavy and solid with strong muscles. Unlike Neanderthals, which had slanted foreheads, the Cro-Magnons had straight foreheads, like modern humans. They lived 400,000 to 37,000 years ago.
Hence Peking man→ Heidelberg man→ Neanderthal man→ Cro-Magnon man is the correct order in the evolutionary history of man.
So, the correct answer is 'Peking man→ Heidelberg man→ Neanderthal man→ Cro-Magnon man'.

Question112

1 st life on earth was
(2001)

Options:

A. cyanobacteria

B. chemoheterotrophs

C. autotrophs

D. photoautotrophs

Answer: B

Solution:

Solution:
The first living beings were prokaryotic, like bacteria. They were single-celled. Nucleic acid core consisted of naked DNA. These living beings were present in the environment of soupy sea having abundant organic molecules. Nutritionally they were chemoheterotrophs. They absorbed the organic materials from outside both for body building and liberation of energy. Respiration was anaerobic since free oxygen was absent in the environment.

Question113

Forthcoming generation are less adaptive than the parental generation due to
(2001)

Options:

A. natural selection

B. mutation

C. genetic drift

D. adaptation.

Answer: B

Solution:

Solution:
Mutation is any hereditary change in the make up of an individual other than that which may be caused by the simple recombination of genes. Mutations may occur in any direction.

Question114

Occurrence of endemic species in South America and Australia is due to (2001)

Options:

A. these species has been extinct from other regions

B. continental separation

C. there is no terrestrial route to these places

D. retrogressive evolution

Answer: B

Solution:

Solution:
Occurrence of endemic species in South America and Australia is due to geographic isolation (continental separation). Animals occupy all diverse habitats. The distribution, continuous or discontinuous of a species or a group of organisms depends on many factors like evolutionary, climatic, physical or biological barriers etc.

Question115

Darwin's theory of pangenesis shows similarity with theory of inheritance of acquired characters then what shall be correct according to it?
(2001)

Options:

A. Useful organs becomes strong and developed while useless organs become extinct.

B. Size of organs increase with aging.

C. Development of organs is due to will power.

D. There should be some physical basis of inheritance.

Answer: D

Solution:

Solution:
According to theory of pangenesis Darwin thought that every somatic cell of the body produces a tiny particle called gemmule or pangene which contains both the parental and acquired characters. All gemmules or pangenes of the body cells collect in the gametes and are passed on to the zygote where they guide the growth of different parts of the embryo.

Question116

Which is not a vestigial organ in man? (2000)

Options:

A. Third molar

B. Nails

C. Segmental muscles of abdomen

D. Coccyx

Answer: B

Solution:

Solution:
The vestigial organs are the useless remnants of structures or organs which might have been large and functional in the ancestors. Segmental muscles in abdomen, coccyx, third molar (wisdom teeth) of human are vestigial organs. Nail is not a vestigial organ of human.

Question117

Homo sapiens have evolved in (2000)

Options:

A. palaeocene

B. pleistocene

C. oligocene

D. holocene

Answer: D

Solution:

Solution:
Homo sapiens sapiens appeared about 25000 years ago in holocene epoch and started spreading all over the world about 10000 years ago. It is believed that the man of today first appeared about 11000 or 10000 years ago in the region around Caspean and Mediterraneasn Seas. From there, its members migrated westwards, eastwards and southwards, respectively changing into the present day white or Caucasoid, Mongoloid and black or Negroid races.

Question118

Character which is closely related to human evolution is (2000)

Options:

A. disappearance of tail

B. reduction in size of jaws

C. binocular vision

D. flat nails

Answer: A

Solution:

Solution:
Humans differ from most primates in that they lack a tail. The lower primates have tails, and the apes, which are believed by many to be our closest relatives, likewise are tailless.

Question119

Which evidence of evolution is related to Darwin's finches? (2000)

Options:

A. Evidences from biogeographical distribution

B. Evidences from comparative anatomy

C. Evidences from embryology

D. Evidences from paleontology

Answer: A

Solution:

Solution:
Galapagos Islands are a chain of 14 islands in the Pacific ocean on the west coast of South America. Charles Darwin visited these islands during his famous voyage on HMS Beagle (name of his ship) in 1835. The flora and fauna of these islands resemble with those of the South American mainland with which the Galapagos Islands were once connected. However, Darwin's finches (birds of Galapagos Islands) influenced Darwin to think about the evolutionary change. These birds designated as Darwins' finches by Dr. David Lack (1947) do not resemble the birds of the South American species. These finches were the first to reach the Galapagos Islands as migrants from the mainland (South America). When they reached the islands, they faced many problems for obtaining food. Thus, they had to change their feeding habits.

Question120

Who is directly related to man?
(2000)

Options:

A. Gorilla

B. Rhesus

C. Gibbon

D. Orangutan

Answer: A

Solution:

Solution:
Apes are the members of the hominoidea superfamily of primates, which includes humans. Under the current classification system there are two families of hominoids.The family hylobatidae consists of 4 genera and 13 species of gibbons, including the Lar Gibbon and the Siamang, collectively known as the "lesser apes".The family hominidae consisting of orangutans, gorillas, chimpanzees, and humans, collectively known as the "great apes".

Question121

Which is the most important factor for continuity of a species from evolutionary point of view?
(2000)

Options:

A. Replication of genetic material

B. Formation of gametes

C. Synthesis of proteins

D. None of these

Answer: A

Solution:

Solution:
Replication of genetic material is the most important factor for continuity of a species from evolutionary point of view. When genetic material replicates, only then it could be transferred from one generation to next resulting in continuity of a species. Asexual animals do not produce gametes while sexual animals do. So, formation of gametes is not an important factor in asexual animals though replication of genetic material takes place in both asexual as well as sexual animals. Synthesis of proteins does not play any role in continuity of species.

Question122

Phenomenon of 'Industrial melanism' demonstrates (1999)

Options:

A. geographical isolation

B. reproductive isolation

C. natural selection

D. induced mutation

Answer: C

Solution:

Solution:
In England, before industrialization in 1860, it was observed that there were more white-winged moths on tree trunks than dark-winged or melanised moths. But after industrialization in 1920, there were more dark-winged moths in the same area. Before industrialization, the tree trunks were covered by white-coloured lichens. In that background, the white-winged moths survived but the dark-winged moths were eaten by predators. During post industrialization period, the tree trunks became dark due to industrial smoke and soot. Therefore, the white winged moths could not survive due to predators but dark-winged moths survived, i.e., the moths that were hidden in background survived. Thus, industrial melanism supports evolution by natural selection.
So, the correct answer is 'Natural selection'.

Question123

Which of the following are homologous organs? (1999)

Options:

A. Wings of bird and hands of human

B. Nails of human being and claws in animals

C. Wings of bird and wings of insect

D. Wings of bat and wings of cockroach

Answer: A

Solution:

Solution:
Wings of birds and hands of human have the same structure but different functions. Birds use their wings for flying while humans use their hands for grasping. Other options show examples of analogous organs. Analogous organs are those organs which have similar functions but different structuraldetails.

Question124

In the developmental history of mammalian heart, it is observed that it passes through a two chambered fish like heart, three chambered frog like heart and finally four chambered stage. To which hypothesis can this above cited statement be approximated?
(1998)

Options:

A. Lamarck's principle

B. Mendalian principles

C. Biogenetic law

D. Hardy-Weinberg law

Answer: C

Solution:

Solution:
Haeckel's biogenetic law states that "Ontogeny repeats phylogeny". Ontogeny is the life history of an organism while phylogeny is the evolutionary history of the race of that organism. In other words an organism repeats its ancestral history during development. Therefore, during embryonic development the mammalian heart first takes the form of fish, then frog and at last mammal.

Question125

The age of the fossil of Dryopithecus on the geological time scale is
(1998)

Options:

A. 2.5×10^6 years back

B. 50×10^6 years back

C. 75×10^6 years back

D. 25×10^6 years back

Answer: A

Solution:

Solution:
The fossil of Dryopithecus africanus was discovered from Miocene rocks of Africa and Europe. It lived about $20 - 25$ million years ago. It was apelike but had arms and legs of the same length. Heels in its feet indicate its semi-erect Dryopithecus africanus is regarded a common ancestor of man and apes (gibons, organgutan, chimpanzee and gorilla).

Question126

Which one of the following statements is correct? (1998)

Options:

A. Australopithecus is the real ancestor of modern man.

B. Neanderthal man is the direct ancestor of Homo sapiens.

C. Homo erectus is the ancestor of man.

D. Cro-magnon man's fossil has been found in Ethiopia.

Answer: C

Solution:

Solution:
Homo erectus is the ancestor of man (not the direct ancestor of modern man). It includes three fossils: Java Ape-man, Peking man and Heidelberg man. Neanderthal man is the direct ancestor of Cro-magnon man which in turn is the direct anceston of modern man. Fossils of Cro-magnon were discovered from France. Australopithecus is the first ape man.

Question127

Species occurring in different geographical area are called as (1998)

Options:

A. sympatric

B. allopatric

C. sibling

D. neopatric

Answer: B

Solution:

Solution:
Allopatric species are those that could interbreed but do not because they are geographically isolated. Sympatric are groups of similar organisms that, although in close proximity and theoretically capable of interbreeding, do not interbreed because of differences in behaviour, flowering time, etc. Siblings are offspring of the same parents.

Question128

The diversity in the type of beaks of finches adapted to different feeding habits on the Galapagos Islands, as observed by Darwin, provides evidence for
(1998)

Options:

A. intraspecific competition

B. interspecific competition

C. origin of species by natural selection

D. intraspecific variations.

Answer: C

Solution:

Solution:
Darwin observed great variations among the organisms that lived on Galapagos islands. The common birds of Galapagos islands, the finches were markedly different from the finches of main land. In fact Darwin took idea from the finches foundon the Galapagos Islands for his theory of natural selection.

Question129

Genetic drift operates only in
(1998)

Options:

A. larger populations

B. Mendelian populations

C. island populations

D. smaller populations

Answer: D

Solution:

Solution:
Genetic drift is change in allele frequencies in a population from generation to generation that occurs due to chance events. To be more exact, genetic drift is change due to "sampling error" in selecting the alleles for the next generation from the gene pool of the current generation. A population's allele frequency is the fraction of the copies of one gene that share a particular form. Genetic drift may cause gene variants to disappear completely and thereby reduce genetic variation. It can also cause initially rare alleles to become much more frequent and even fixed. Although genetic drift happens in populations of all sizes, its effects tend to be stronger in small populations. So the correct option is 'smaller population'.

Question130

Which of the following statements is correct regarding evolution of mankind?
(1997)

Options:

A. Homo erectus is preceded by Homo habilis.

B. Neanderthal man and cro-magnon man were living at the same time.

C. Australopithecus was living in Australia.

D. None of these

Answer: A

Solution:

Solution:
Homo habilis lived during Pleistocene. He lived in Africa about 2 million years ago. He was about 1.2 to 1.5 metres tall. He had bipedal locomotion, moved erect and was omnivorous. Homo habilis (habilis = mentally able or skilful) was the first tool maker and used tools of chipped stones extensively.
Homo erectus appeared about 1.7 million years ago in middle Pleistocene. H . erectus evolved from Homo habilis. He had erect posture, protruding jaws, projecting brow ridges and small canines and large molar teeth. He was omnivorous. He made more elaborate tools of stones and bones, hunted big game and perhaps knew use of fire.

Question131

Common origin of man and chimpanze is best shown by
(1997)

Options:

A. binocular vision

B. chromosome number

C. dental formula

D. cranial capacity.

Answer: D

Solution:

Solution:
A close relationship of apes with man is revealed by their relatively larger brain and cranial capacity, efficient memory. Cranial capacity of apes is under 650cc. Cranial capacity of man is 1350 to 1600cc

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Question132

Which of the following is a living fossil? (1997)

Options:

A. Mirabilis jalapa

B. Ginkgo biloba

C. Pinus longifolia

D. Dalbergia sissoo

Answer: B

Solution:

Solution:
Ginkgo biloba is the world's oldest living plant, and is known as a 'living fossil' because it has no close living relatives. It is found in fossils dating back 270 million years.
So, the correct answer is 'Ginkgo biloba'

Question133

Evolutionary convergence is characterized by (1997)

Options:

A. development of dissimilar characteristics in closely related groups

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

C. development of characteristics by random mating

D. replacement of common characteristics in different groups

Answer: B

Solution:

Solution:
Development of similar adaptive functional structures in unrelated groups of organisms is called convergent evolution. Example : wings of insect, bird and bat. Thus analogous organs show convergent evolution (adaptive convergence).

Question134

The animals of cold countries have relatively shorter and poorly developed ears, eyes, hairs and other phenotypic characters. This is known by which law?
(1996)

Options:

A. Cope's Law

B. Dollo's Law

C. Allen's Law

D. Bergamann's Law.

Answer: C

Solution:

Solution:
Allen's law states, animals that live in very cold climates, their extremities such as ears, tails etc. become progressively smaller. Cope's law states that there is a tendency for animals to increase in size during the long course of evolution. Dollo's law states that evolution is irreversible. Bergman's law states that warm blooded animals become larger in the northern and colder parts of their range.

Question135

Which of the following changes for man in the course of evolution is probably useless?
(1996)

Options:

A. Development of being erect

B. Development of cranial capacity

C. Loss of tail

D. Development of opposable thumb

Answer: C

Solution:

Solution:
Loss of tail is probably the useless change for the man in the course of evolution. The volume of cranial cavity and size of skull also increased in order to accommodate the large and complex brain. The modern man excels all other animals in intelligence. Erect posture of human beings is due to major changes in the muscle skeletal system. During the course of evolution of man, thumb (pollex) has been brought opposite to the fingers thus enabling the hand for better grasping power.

Question136

Which of the following is the direct ancestor of Homo sapiens? (1996)

Options:

A. Australopithecus

B. H. sapiens neanderthals

C. Homo erectus

D. Homo sapiens fossilis

Answer: D

Solution:

Solution:
Homo sapiens fossilis is also known by the name of Cro-magnon man. He was the direct ancestor of modern man (Homo sapiens). Cro-Magnon man emerged about 34000 years ago in Holocene epoch. Thus, it is regarded as most recent ancestor of today's man. Its cranial capacity was, however, somewhat more than ours, being about $1650cc$. It became extinct about $10000 - 11000$ years ago.

Question137

Which of the following is the correct group of vestigial organs in man? (1996)

Options:

A. Nictitating membrane, ear muscles, eyelids and coccyx

B. Appendix, coccyx, ear muscles and elbow joint

C. Wisdom tooth, coccyx, body hair and ear muscles

D. Wisdom tooth, body hairs, nictitating membrane and vermiform appendix

Answer: D

Solution:

Solution:
Human body has been described to possess about 90 vestigial organs. Some of these are nictitating membrane, muscles of pinna (part of external ear), vermiform appendix, caudal vertebrae (also called coccyx or tail bone), third molars (wisdom teeth), hair on body, and nipples in male.

Question138

Which of the following is an example of "living fossils'? (1996)

Options:

A. Pinus

B. Riccia

C. Gnetum

D. Ginkgo

Answer: D

Question139

The correct sequence for the manufacture of molecules/organic compounds on the primitive earth is (1996)

Options:

A. NH_3, nucleic acid, protein and carbohydrate

B. protein, carbohydrate, water and nucleic acid

C. NH_3, protein, carbohydrate and nucleic acid

D. NH_3, water, nucleic acid and protein.

Answer: D

Solution:

Solution:
Hydrogen atoms were most numerous and most reactive in primitive atmosphere. First hydrogen atoms combined with all oxygen atoms to form water and leaving no free oxygen. Hydrogen atoms also combined with nitrogen, forming ammonia (NH_3). So water and ammonia were probably the first compound molecules of primitive earth. Later methane, water and NH_3 join to form amino acids which gets converted into proteins while hydrogen bases, sugars and phosphates combine to form nucleic acids.

Question140

The first domesticated animal by primitive man was (1996)

Options:

A. cat

B. cow

C. dog

D. horse.

Answer: C

Solution:

Solution:
The first domesticated animal by primitive man was dog. Cro-magnon man used to carry domesticated dogs while going for hunting.

Question141

Which of the following isotopes is most dangerous to Homo sapiens? (1995)

Options:

A. Phosphorus-32

B. Strontium-90

C. Caesium-137

D. Iodine-131

Answer: B

Solution:

Solution:
The radioactive strontium - 90 can lead to various bone disorders and diseases, including bone cancer. It emits high energy beta radiations. Phosphorus -32 also emit high energy beta radiations but they cannot penetrate human skin. Caesium - 137 (beta emitter) and iodine -131 (β and γ emitter) also pose danger to human health but not as much as strontium - 90 which is a long-lived radioactive element and tends to cycle like calcium.

Question142

The change of the lighter-coloured variety of peppered moth (Biston betularia) to its darker variety (Biston carbonaria) is due to (1995)

Options:

A. mutation

B. regeneration

C. genetic isolation

D. temporal isolation.

Answer: A

Solution:

Solution:
mutation of single Mendelian gene for survival in smoke laden industrial environment

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Question143

The homologous organs are those that show similarity in (1995)

Options:

A. appearance

B. function

C. origin

D. size.

Answer: C

Solution:

Solution:
Homologous structures have the same embryonic origin and basic structure, though they mayor may not perform the same function. Homologous structures shows that the animal which possess them have common ancestory and show evolution by divergence from the ancestral type. Vestigial organs are those which have ceased to be any use to their possessor but still persist generation after generation in a reduced form. They are retrogressive organs but were well developed and functional in the ancestors.

Question144

Which period is dubbed as the age of prokaryotic microbes? (1995)

Options:

A. Precambrian

B. Phanerozoic

C. Archean

D. Proterozoic

Answer: A

Solution:

Solution:
Precambrian period extends from 2300 to 3800 million years ago, which is considered as period of early life. During this period prokaryotes (monera) and eukaryotes (protista) originate.

Question145

The presence of gill slits, in the embryos of all vertebrates, supports the theory of (1995)

Options:

A. metamorphosis

B. biogenesis

C. organic evolution

D. recapitulation.

Answer: D

Solution:

Solution:
In the embryos of all vertebrates, the presence of gill slits support the theory of recapitulation (repeating the early stages of embryogenesis in earlier evolved animals.

Question146

Two zoogeographical regions, separated by high mountain ranges, are (1995)

Options:

A. Nearctic and Palaearctic

B. Neotropical and Ethiopian

C. Oriental and Australian

D. Palaearctic and Oriental.

Answer: D

Solution:

Solution:
Sclatter in 1857 recognised six zoogeographical regions on the basis of the distribution of terrestrial vertebrates, chiefly mammals.
(i) The Palaearctic region
(ii) The Ethiopian region
(iii) The Indian region (Oriental)
(iv) The Australian region
(v) The Neotropical region
(vi) The Neoarctic region
The Palaearctic region includes the whole northern part of the Old World, i.e. whole of Europe, northern part of Africa and Asia, North of the Himalayas. Oriental region includes the whole of India, Ceylon, South China, Burma, Thailand, Malaya of Peninsula, Malayan Islands. The Palaearctic and Oriental regions are separated by Himalayan range.

Question147

Which one of the following changes involved is irrelevant, in the evolution of man?
(1994)

Options:

A. Perfection of hand for tool making

B. Change of diet from hard nuts and hard roots to soft food

C. Loss of tail

D. Increase in the ability to communicate with others and develop community behaviour

Answer: B

Solution:

Solution:
In ancient period hands were used to collect food and to save themselves. Gradually men learnt to cook food, to make tools for their own purpose, this change in habit brings perfection in their hand. Similarly, there is an increase in the ability to communicate with others and develop community behaviour. But as in ancient period, men still eat hard nuts and hard roots (though they often take soft food also). Thus change in diet is the most irrelevant change in the evolution of man.

Question148

Which of the following evidences does not favour the Lamarckian concept of inheritance of acquired characters? (1994)

Options:

A. Lack of pigment in cave-dwelling animals

B. Melanization in peppered moth

C. Absence of limbs in snakes

D. Presence of webbed toes in aquatic birds

Answer: B

Solution:

Solution:
Melanization in peppered moth is an example in support of the theory of natural selection. Lamarckism is the first theory of evolution, which was proposed by Jean Baptiste de Lamarck. Its theory of inhertance of acquired characters cannot be explained by melanization in peppered moth.

Question149

The earliest fossil form, in the phylogeny of horse, is (1994)

Options:

A. Equus

B. Mesohippus

C. Eohippus

D. Merychippus.

Answer: C

Solution:

Solution:
The first fossil of the horse was found in north America. It was named Eohippus. This horse was about the size of a fox having short head and neck. The fore feet were with four complete fingers and one splint of first finger and the hind feet with three functional toes and one splint of fifth toe. Other stages in the evolution of horse were mesohippus, merychippus, pliohippus and equus.

Question150

Which of the following is a pair of homologous organs? (1994)

Options:

A. Pectoral fin of rohu and fore-limb of horse

B. Wings of grasshopper and wings of crow

C. Lungs of rabbit and gills of rohu

D. Wings of bat and wings of butterfly

Answer: A

Solution:

Solution:
Homologous organs are those organs which are similar in their morphology, anatomy, genetics and embryology but dissimilar in their functions. For example, pectoral fins of rohu are homologous to the forelimbs of tetrapods.

Question151

The process of mating of individuals, which are more closely related than the average of the population to which they belong, is called (1994)

Options:

A. heterosis

B. self breeding

C. inbreeding

D. hybridization

Answer: C

Solution:

Solution:
Inbreeding is mating between closely related individuals, the extreme condition being selffertilization, which occurs in many plants and some primitive animals. Heterosis is also known as hybrid vigour which is the increased vigour displayed by the offspring from a cross between genetically different parents. Hybridization is the production of one or more hybrid organisms by the mating of genetically different parents. In self-breeding the male and female gametes are derived from the same individual.

Question152

Evolutionary convergence is development of
(1993)

Options:

A. common set of characters in group of different ancestry

B. dissimilar characters in closely related groups

C. common set of characters in closely related groups

D. random mating

Answer: A

Solution:

Solution:
A case of convergent evolution is the comparable idea of the wings of creepy crawlies, fowls, and bats. Every one of the four serves a similar capacity and is comparable in structure, however, each developed autonomously.So, the correct option is ' Common set of characters in groups of different ancestry'

Question153

Weismann cut off tails of mice generation after generation but tails neither disappeared nor shortened showing that
(1993)

Options:

A. Darwin was correct

B. tail is an essential organ

C. mutation theory is wrong

D. lamarckism was wrong in inheritance of acquired characters.

Answer: D

Solution:

Solution:
Lamarck gave theory of Lamarckism in which he explained inheritance of acquired characters which states that whatever an individual acquires characters in its life time due to internal vital force, effect of environment, new needs and use and disuse of organs, they are inherited to the next generations. The process continues. After several generations, the variations are accumulated upto such extent that they give rise to new species. This theory was proved wrong by August Weismann. Weismann cut off the tails of rats for as many as 22 generations and allowed them to breed, but tailless rats were never born.

Question154

Theory of Natural Selection dwells on (1993)

Options:

A. role of environment in evolution

B. natural selection acting on favourable variations

C. changes in gene complex resulting in heritable variations

D. none of the above

Answer: B

Solution:

Solution:
According to Darwin's theory of evolution, more individuals are produced in each generation that can survive. Phenotypic variation exists among individuals and the variation is heritable. Only the organisms best adapted to their environment tend to survive and transmit their genetic characters in increasing numbers to succeeding generations while those less adapted tend to be eliminated.So, the correct answer is 'Natural selection acting on favourable variations'

Question155

Genetic drift is change of (1993)

Options:

A. gene frequency in same generation

B. appearance of recessive genes

C. gene frequency from one generation to next

D. none of the above

Answer: C

Solution:

Solution:
Genetic drift is a sudden change in the frequency of an existing gene in a gene pool of a species, transmitted to the next generation, could occur due to a drastic change in the environment, an accident that may result in abundance of a particular allele type.
So, the correct answer is 'A sudden change in gene frequency from one generation to next'

Question156

The first organisms were
(1992)

Options:

A. chemoautotrophs

B. chemoheterotrophs

C. autotrophs

D. eukaryotes.

Answer: B

Solution:

Solution:
The organic molecules formed in primitive ocean under primitive reducing conditions of earth served as the only source of carbon for first life form of earth. The first life forms, bacteria like prokaryotic cell, originated from protocell in Archaeozoic era and were anaerobic chemoheterotrophs that used the organic component as a source of energy and carbon. The organisms that use organic/inorganic compounds as their carbon source are called as heterotrophs while those that can synthesize their two organic compounds are known as autotrophs. Since the first life forms fed on available organic compounds, they were heterotrophs. Due to the limited supply of organic compounds, organisms evolved photosystem to capture sunlight to be used as a source of energy thereby leading to the origin of photoautotrophs. The organisms that use light as a source of energy and carbon dioxide as a chief carbon source are referred to as photoautotrophic organisms. phototrophs appeared much later in evolution.

Question157

Which was absent in the atmosphere at the time of origin of life?
(1991)

Options:

A. NH_3

B. H_2

C. O_2

D. CH_4

Answer: C

Solution:

Solution:
The primitive atmosphere was reducing atmosphere i . e., without free oxygen.

Question158

Correct order is
(1991)

Options:

A. Palaeozoic → archaeozoic → coenozoic

B. Archaeozoic → palaeozoic → proterozoic

C. Palaeozoic → mesozoic → coenozoic

D. Mesozoic → archaeozoic → proterozoic

Answer: C

Solution:

Solution:
The first geological time scale was developed by Giovanni Avduina, Italian scientist in 1760. The history of the earth has been divided into a number of major divisions called eras. The eras are sub-divided into periods. The modern periods are further divided into epochs.
There are four eras. The correct sequence is Precambrian Palaeozoic (era of ancient life) → Mesozoic (era of medieval life) → Coenozoic (era of modern life).

Question159

Study of fossils is
(1991)

Options:

A. palaeontology

B. herpetology

C. saurology

D. organic evolution

Answer: A

Solution:

Solution:
Palaeontology is the study of extinct organisms, including their structure, environment, evolution, and distribution, as revealed by their fossil remains. Herpetology is the study of reptiles and amphibians. Saurology is the study of snakes. Organic evolution deals with study of origin of life and origin of new species.

Question160

Parallelism is
(1990)

Options:

A. adaptive divergence

B. adaptive divergence of widely separated species

C. adaptive convergence of widely different species

D. adaptive convergence of closely related groups.

Answer: D

Solution:

Solution:
Development of similar adaptive functional structures in unrelated groups of organisms is called adaptive convergence or convergent evolution e . g. wings of insect, bird and bat show marked convergent evolution. When convergent evolution is found in closely related species, it is called "Parallel evolution". Example : development of running habit in deer (2 - toed) and horse (1 − toed) with two vestigial splint bones.

Question161

Basic principles of embryonic development were pronounced by
(1990)

Options:

A. von Baer

B. Weismann

C. Haeckel

D. Morgan

Answer: A

Solution:

Solution:
he basic laws principles of embryonic development were given by von Baer in 1828.
According to this theory, fertilization results in a zygote and triggers embryonic development.
Hence basic principles of embryonic development were pronounced by 'Von Baer'. So, the correct answer is 'Von Baer'.

Question162

Evolution is
(1989)

Options:

A. progressive development of a race

B. history and development of race along with variations

C. history of race

D. development of race

Answer: B

Solution:

Solution:
The term evolution was coined by Herbert Spencer, an English philosopher which means unrolling or unfolding of nature that brings about an orderly change from one form or condition to another resulting in descendents becoming different from ancestors. Thus, it is history and development of race alongwith variations.

Question163

"Continuity of germplasm" theory was given by
(1989)

Options:

A. De Vries

B. Weismann

C. Darwin

D. Lamarck

Answer: B

Solution:

Solution:
Weismann cut off the tails of rats for about 22 generations but there was no reduction in the size of the tail. On the basis of this experiment, Weismann proposed the theory of the continuity of germplasm. According to Weismann,Two type of matters is present in organism, somatoplasm and germplasm.
Somatoplasm in the somatic cells and germplasm in the germinal cell.
Somatoplasm dies with the death of organisms while germplasm is transferred into the next generation.

If any variation develops in germplasm, it is inherited, while if variation develops in somatoplasm it is not transmitted.
So, the correct answer is 'Weismann'

Question164

Theory of inheritance of acquired characters was given by (1989)

Options:

A. Wallace

B. Lamarck

C. Darwin

D. De Vries.

Answer: B

Solution:

Solution:
The first theory of evolution was proposed by Jean Baptiste de Lamarck Lamarckism proposed,Some internal forces are present in all organisms. Due to the presence of these forces, the organism has the tendency to increase the size of their organs or the entire body.
Environment influences all type of organisms. Changing environment give rise to new needs. New needs or desires produce new structure and change habits of the organism.
If an organ is constantly used, it would be better developed whereas disuse of organ results in its degeneration.
So, the correct option is 'Lamarck'

Question165

'Origin of Species was written by (1989)

Options:

A. Oparin

B. Weismann

C. Lamarck

D. Darwin.

Answer: D

Solution:

Solution:
Darwin published his observations and conclusions regarding evolution in the book "Origin of Species" in 1859. Darwin's this book became very popular and changed people's thinking about organic evolution.

Question166

Humming birds and Hawk illustrate (1988)

Options:

A. convergent evolution

B. homology

C. adaptive radiation

D. parallel evolution.

Answer: C

Solution:

Development of different functional structures from a common ancestor is called adaptive radiation. Eg: Hummingbird and hawk moth, Darwin's finches, etc. Whereas development of similar functional structures from different ancestors are known as convergent evolution. Eg: wings of insect and bat.
So the correct answer is adaptive radiation.
