

BIOLOGY

NEET

CRASH COURSE

EVOLUTION

SMART ACHIEVERS
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EVOLUTION

2. Most scientists believe chemical evolution, i.e., formation of biomolecules preceded the appearance of the first cellular forms of life.
4. Diversity of life forms on earth has been changing over millions of years.
5. It is generally believed that variations in a population result in variable fitness.
6. Other phenomena like habitat fragmentation and genetic drift may accentuate these variations leading to appearance of new species and hence evolution.
7. Homology is accounted for by the idea of branching descent.
8. Study of comparative anatomy, fossils and comparative biochemistry provides evidence for evolution.
9. Among the stories of evolution of individual species, the story of evolution of modern man is most interesting and appears to parallel evolution of human brain and language.
10. About 15 mya, primates called Dryopithecus and Ramapithecus were existing.
11. They were hairy and walked like gorillas and chimpanzees.
12. Ramapithecus was more man-like while Dryopithecus was more ape-like.
13. Few fossils of man-like bones have been discovered in Ethiopia and Tanzania.
14. These revealed hominid features leading to the belief that about 3-4 mya, man-like primates walked in eastern Africa.
15. They were probably not taller than 4 feet but walked up right.
16. Two mya, Australopithecus probably lived in East African grasslands.
17. Evidence shows they hunted with stone weapons but essentially ate fruit.
18. Some of the bones among the bones discovered were different.
19. This creature was called the first human-like being the hominid and was called Homo habilis.
20. The brain capacities were between 650-800cc.
21. They probably did not eat meat.
22. Fossils discovered in Java in 1891 revealed the next stage, i.e., Homo erectus about 1.5 mya.
23. Homo erectus had a large brain around 900cc.
24. Homo erectus probably ate meat.
25. The Neanderthal man with a brain size of 1400cc lived in near east and central Asia between 1,00,000-40,000 years back.
26. They used hides to protect their body and buried their dead.
27. Homo sapiens arose in Africa and moved across continents and developed into distinct races.
28. During ice age between 75,000-10,000 years ago modern Homo sapiens arose.
29. Pre-historic cave art developed about 18,000 years ago.
30. Agriculture came around 10,000 years back and human settlements started.
31. The rest of what happened is part of human history of growth and decline of civilisations.

EXERCISE

- Q.1 Atmosphere of earth just before the origin of life consisted of
 (1) Water vapours, CH₄, NH₃ and Oxygen (2) CO₂, NH₃ and CH₄
 (3) CH₄, NH₃, H₂ and water vapours (4) CH₄, O₃, O₂ and water vapours
- Q.2 Spontaneous generation theory of origin of life was disproved through experiment involving swan-neck flasks by
 (1) Van Helmont (2) Reddi (3) Louis Pasteur (4) Spallanzani
- Q.3 Experimental proof that some simple molecules like H₂, NH₃, CH₄ and H₂O gave rise to amino acids during origin of life was provided by
 (1) Lamarck (2) Darwin (3) Stanley Miller (4) Harold Urey
- Q.4 Oparin's theory is based on
 (1) Artificial synthesis (2) Spontaneous generation
 (3) God's creation (4) Panspermia
- Q.5 Who said that organisms develop from pre-existing organisms
 (1) Aristotle (2) Louis Pasteur (3) Oparin (4) Morgan
- Q.6 Spark discharge apparatus for testing chemical origin of life was designed by
 (1) Urey and Miller (2) Jacob and Monad
 (3) Oparin and Haldane (4) Dixon and Joly
- Q.7 Correct order is
 (1) Palaeozoic → Archaeozoic → Coenozoic (2) Archaeozoic → Palaeozoic → Proterozoic
 (3) Palaeozoic → Mesozoic → Coenozoic (4) Mesozoic → Archaeozoic → Proterozoic
- Q.8 Homologous organs are
 (1) Dissimilar origin and dissimilar structures
 (2) Dissimilar origin but similar functions
 (3) Similar origin with similar or dissimilar functions
 (4) Similar origin with dissimilar functions
- Q.9 Golden Age of Dinosaurs'/Age of reptiles was
 (1) Mesozoic (2) Coenozoic (3) Palaeozoic (4) Psychozoic
- Q.10 Homologous organs are
 (1) Wings of Pigeon and Butterfly (2) Wings of Pigeon and Housefly
 (3) Wings of Pigeon and arms of Humans (4) Wings of Bat, Housefly and Butterfly
- Q.11 Which one is not a vestigial structure in humans
 (1) Epiglottis (2) Vermiform appendix (3) Wisdom teeth (4) Body hair
- Q.12 Angiosperms flourished during
 (1) Mesozoic (2) Coenozoic (3) Palaeozoic (4) Precambrian

- Q.13 Archaeopteryx is known as missing/connecting link because it is a fossil and has characters between
 (1) Fishes and amphibians (2) Birds and reptiles
 (3) Reptiles and mammals (4) Chordates and non-chordates
- Q.14 Analogous organs are
 (1) Wings of Bird and Butterfly (2) Wings of Bird and Bat
 (3) Limbs of Horse and Human (4) Teeth of Human and Gorilla
- Q.15 Fossil X is older than fossil Y because
 (1) Fossil X was found in deeper sedimentation
 (2) Fossil Y was found in deeper sedimentation
 (3) Fossil Y has homologous and analogous organs of X
 (4) Fossil Y has some vestigial organs functional in X
- Q.16 In human beings vestigial organs are
 (1) Wisdom tooth, coccyx, nail, eye lid and vermiform appendix
 (2) Wisdom tooth, coccyx, vermiform appendix, pancreas and elbow joint
 (3) Wisdom tooth, coccyx, vermiform appendix, nictitating membrane and auricular muscles
 (4) Coccyx, wisdom tooth, nail, auricular muscles
- Q.17 Wings of Mosquito, Bat and Bird show evolution called
 (1) Divergent (2) Convergent (3) Atavism (4) Parallel
- Q.18 Cranial capacity was highest in
 (1) Cro-Magnon Man (2) Neanderthal Man (3) Java Man (4) Peking Man
- Q.19 Which one is the closest to modern man?
 (1) Peking Man (2) Cro-Magnon Man (3) Java Ape Man (4) African Man
- Q.20 Which one of the following is closest relative of man?
 (1) Sinanthropus / Chimpanzee (2) Orang Utan
 (3) Gorilla (4) Gibbon
- Q.21 Evolution of Man is believed to have taken place in
 (1) Central America (2) Australia (3) Asia (4) Africa
- Q.22 Which one of the following was the first to stand erect/show bipedal movement,?
 (1) Peking Man (2) Australopithecus (3) Java man (4) Cro-Magnon Man
- Q.23 Zoological name of Java man is
 (1) Homo habilis (2) Homos (3) Homo erectus (4) Australopithecus
- Q.24 Which is correct regarding evolution of mankind?
 (1) Homo erectus was preceded by Homo habilus
 (2) Australopithecus lived in Australia
 (3) Neanderthal Man and Cro-Magnon Man lived together
 (4) None of the above

- Q.25 'Survival of Fittest' was used by
 (1) Charles Darwin (2) Herbert Spencer
 (3) Jean Baptiste Lamarck (4) Hugo de Vries
- Q.26 Who believed that an organ in disuse will become vestigial ?
 (1) Lamarck (2) De Vries (3) Mendel (4) Darwin.
- Q.27 Neo-Darwinism believes that new species develop through
 (1) Mutations with natural selection (2) Continuous variations with natural selection
 (3) Hybridisation (4) Mutations.
- Q.28 Galapagos Islands were visited by
 (1) Wallace (2) Darwin (3) Lamarck (4) De Vries
- Q.29 'Origin of Species' was written by
 (1) Oparin (2) Weismann (3) Lamarck (4) Darwin
- Q.30 Hugo de Vries' contribution is
 (1) Theory of Natural selection (2) Theory of Mutations
 (3) Law of dominance (4) Law of segregation
- Q.31 Hugo de Vries worked on the plant
 (1) Garden Pea/Pisum sativum (2) Sweet Pea/Lathyrus odoratus
 (3) Primula sinensis (4) Evening Primrose/Oellotheraiana.
- Q.32 Theory of Natural selection dwells on
 (1) Role of environment in evolution
 (2) Natural selection acting on favourable variations
 (3) Changes in gene complex resulting inheritable variations
 (4) Inheritance of acquired characters
- Q.33 Genetic drift is change of
 (1) Gene frequency same generation
 (2) Appearance of recessive genes
 (3) Gene frequency from one generation to next
 (4) None of the above
- Q.34 Which one provides correct sequence of events in origin of new species according to Darwinism?
 1. Natural selection
 2. Variations and their inheritance
 3. Survival of the fittest
 4. Struggle for existence.
 (1) 1,2, 3, 4 (2) 2, 3, 1,4 (3) 3,4, 1,2 (4) 4, 2, 3, 1.
- Q.35 Sumtotal of genes in a population is
 (1) Genotype (2) Karyotype (3) Genetic constitution (4) Gene pool

- Q.36 Light coloured Peppered Moth/Biston betularia gets changed to its darker variety due to
 (1) Translocation of block of genes in response to heavy carbons
 (2) Deletion of gene segment due to industrial pollution
 (3) Mutation of single mendelian gene for survival in smoke laden industrial environment
 (4) Industrial carbon deposited on wings.
- Q.37 Presence of different types of beaks in finches of Galapagos islands adapted to different feeding habits provides evidence for
 (1) Intraspecific variations (2) Natural selection
 (3) Intraspecific competition (4) Interspecific competition.
- Q.38 Allopatric speciation is caused by
 (1) Temporal isolation (2) Adaptive radiation
 (3) Geographic isolation (4) Reproductive isolation'
- Q.39 Sympatric speciation is caused by
 (1) Genetic isolation (2) Interbreeding
 (3) Geographical isolation (4) Reproductive isolation

AIIMS Special

Instructions for following questions (Q.40 to Q.78).

- (1) If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).
- (2) If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2).
- (3) If Assertion is true statement but Reason is false, then mark (3).
- (4) If both Assertion and Reason are false statements, then mark (4).

- Q.40 **Assertion :** Interspecific hybrids are usually sterile.
Reason : Interspecific hybrids receive chromosomes from two different species.
- Q.41 **Assertion :** Cretaceous period is called age of Dinosaurs.
Reason : Fishes originated in Devonian period.
- Q.42 **Assertion :** Theory of special creation attributes the origin of life to a vitalistic event.
Reason : According to this theory God is creator of life.
- Q.43 **Assertion :** Both mule and hinny are sterile.
Reason : These are the examples of hybrid sterility.
- Q.44 **Assertion :** Balanced polymorphism is directly related with directional selection.
Reason : Directional selection favours the maximum dominancy of characters
- Q.45 **Assertion :** Artificial selection is highly beneficial for human.
Reason : Artificial selection is carried out by man.

- Q.46 **Assertion :** Batesian mimicry is a form of mimicry in which an edible species resembles an inedible one.
Reason : Batesian mimicry is a form of protective mimicry.
- Q.47 **Assertion :** There is no life on moon.
Reason : Water is absent on moon.
- Q.48 **Assertion :** The first living organism on earth were autotrophs.
Reason : They were capable to performing chemosynthesis.
- Q.49 **Assertion :** Base analogous induced transition.
Reason : Base analogous performs forbidden pairing.
- Q.50 **Assertion :** Sympatric species are geographically isolated.
Reason : Sympatric species are reproductively isolated.
- Q.51 **Assertion :** First life originated in water.
Reason : Conditions were favourable for origin of life in water.
- Q.52 **Assertion :** Analogous organs show common ancestry.
Reason : Analogous organ show evolution.
- Q.53 **Assertion :** Lung fish is a connective link between fishes and amphibia.
Reason : Lung fish show characters of both fishes and amphibia.
- Q.54 **Assertion :** Liger in a hybrid animal.
Reason : Liger is fertile.
- Q.55 **Assertion :** Jurassic period is considered the age of reptiles.
Reason : Reptiles dominated in all habitats during jurassic period.
- Q.56 **Assertion :** Human and apes have a common ancestry.
Reason : Man and chimpanzee have similar banding pattern of chromosome.
- Q.57 **Assertion :** Homologous organs suggest same origin.
Reason : Organs which are similar in function and dissimilar in internal morphology called as Homologous organs.
- Q.58 **Assertion :** In mammals the forelimbs perform, different functions.
Reason : The forelimbs in different mammals consist of different sets of bones.
- Q.59 **Assertion :** Analogous organs suggest same origin.
Reason : Fore legs of horse and hand of human are analogous organs.
- Q.60 **Assertion :** Mammals have evolved from egg laying species.
Reason : Prototherians are oviparous.

- Q.61 **Assertion :** Missing links are most important to study evolutionary history.
Reason : They fill the gaps of closely related groups
- Q.62 **Assertion :** Ear muscles of external ear in man are vestigial.
Reason : These muscles in man are useful which move external ear freely to detect sound efficiently.
- Q.63 **Assertion :** Vestigial organs are those parts of body which are greatly reduced and are useless.
Reason : These are the remnants of once fully developed organs which are gradually lost as there were no longer necessary.
- Q.64 **Assertion :** Snakes lost their legs. They do not have use of legs.
Reason : All the living organism can reduce or increase the organ with the help of internal vital force.
- Q.65 **Assertion :** Australopithecus was first ancestor of man who show bipedal locomotion.
Reason : Mutation are raw material for evolution.
- Q.66 **Assertion :** Reducing atmosphere was essential for origin of life on earth.
Reason : The early proteins and nucleic acids are formed by non enzymatic process.
- Q.67 **Assertion :** Probably DNA evolved after the RNA.
Reason : RNA has both catalytic and genetic information transfer function.
- Q.68 **Assertion :** Life originated about 3.9 billion years ago.
Reason : Life originated in pre cambrian era.
- Q.69 **Assertion :** A.R. Wallace divide whole world into six major realms.
Reason : India is present in oriental realm.
- Q.70 **Assertion :** Mimicry is a kind of adaptation.
Reason : Mullarian mimicry is an example of aggressive mimicry.
- Q.71 **Assertion :** Evolution occurs within populations.
Reason : Relative frequencies of different variations of DNA change over time.
- Q.72 **Assertion :** Nucleoprotein were first sign of life.
Reason : The protocell represented the beginning of life.
- Q.73 **Assertion :** When the two species are morphologically similar but do not normally interbreed, such species are called sibling species.
Reason : Stabilising selection reduces variation but does not change the mean value.
- Q.74 **Assertion :** Lamarck published the theory of evolution in 1809 the year Charles Darwin was born.
Reason : According to Lamarckism if an organ is used constantly, it will tend to become developed, whereas disuse result in degeneration.

ANSWER KEY

Q.1	3	Q.2	3	Q.3	3	Q.4	1	Q.5	2	Q.6	1	Q.7	3
Q.8	3	Q.9	1	Q.10	3	Q.11	1	Q.12	2	Q.13	2	Q.14	1
Q.15	1	Q.16	3	Q.17	2	Q.18	1	Q.19	2	Q.20	1	Q.21	4
Q.22	2	Q.23	3	Q.24	1	Q.25	2	Q.26	1	Q.27	1	Q.28	2
Q.29	4	Q.30	2	Q.31	4	Q.32	2	Q.33	3	Q.34	4	Q.35	4
Q.36	3	Q.37	2	Q.38	3	Q.39	4	Q.40	2	Q.41	4	Q.42	2
Q.43	2	Q.44	4	Q.45	2	Q.46	2	Q.47	1	Q.48	4	Q.49	1
Q.50	4	Q.51	1	Q.52	4	Q.53	1	Q.54	2	Q.55	1	Q.56	1
Q.57	3	Q.58	3	Q.59	4	Q.60	1	Q.61	1	Q.62	3	Q.63	1
Q.64	4	Q.65	2	Q.66	2	Q.67	1	Q.68	2	Q.69	2	Q.70	3
Q.71	1	Q.72	2	Q.73	2	Q.74	2						