

EUEE Questions on Evolution (2003 – 2011)

PART I: THE ORIGIN OF LIFE

1. Which group of organisms is found at a lower level of evolution according to the modern principles of biology? (2003)
 - A. Protists
 - B. Fungi
 - C. Animals
 - D. Plants
2. In the process of the evolution of life on earth, which of the following four processes evolved last? (2005)
 - A. Photosynthesis
 - B. Aerobic respiration
 - C. Chemosynthesis
 - D. Photo-autotrophism
3. During the course of evolution, which of the following events came before all the others? (2005)
 - A. Origin of dinosaurs and other reptiles
 - B. Availability of free oxygen in the atmosphere
 - C. Origin of the oldest eukaryotic organisms
 - D. Origin of the first multicellular animals and plants
4. What is the branch of biology that studies about the origin and gradual changes of living things? (2006)
 - A. Microbiology
 - B. Evolution
 - C. Mutation
 - D. Reproduction
5. Which one of the following eukaryotic cell organelles was a free living cell before eukaryotic cells evolved? (2006)
 - A. Nucleus
 - B. Ribosomes
 - C. Chloroplast
 - D. Nucleolus
6. Which of the following did the early heterotrophs do that probably assisted the origin of autotrophs? (2006)
 - A. They added oxygen and chlorophyll to the environment
 - B. They added carbon dioxide to the environment
 - C. They stored energy in the bonds of inorganic compounds.
 - D. They manufacture food from carbon dioxide and oxygen

7. Which of the following groups are believed to be the first photosynthetic organisms to evolve on Earth? (2009)
- A. Green plants
 - B. Green algae
 - C. Blue green algae
 - D. Lichens
8. Among the following four processes, identify the one that probably evolved before all other three? (2009)
- A. Aerobic respiration
 - B. Anaerobic respiration
 - C. Oxidizing atmosphere
 - D. Photosynthesis
9. Among the theories about the origin of life, which one better agrees with the concept of change in organisms and their genetic composition over generations being caused by meiosis, hybridization, natural selection or mutation? (2010)
- A. Biochemical origin theory
 - B. Cosmozoan theory
 - C. Special creationism theory
 - D. Spontaneous generation theory
10. Which of the following is the most accepted theory about the origin of life on earth? (2010)
- A. Theory of spontaneous evolution
 - B. Theory of chemical evolution
 - C. The cosmic theory
 - D. Theory of special creation
11. What is the reason that Stanley Miller excluded free oxygen from the mixture of the gases that used for his simulation experiment? (2010)
- A. Primitive atmosphere was reducing.
 - B. Early organic molecules did not contain oxygen.
 - C. Oxygen cannot react with the rest of the gases.
 - D. The primitive atmosphere was full of oxygen.

12. Which of the following is the common idea held by all the creationists? (2011)

- A. Life is eternal.
- B. All life was created in six days.
- C. Life was created by a supernatural being.
- D. Life came to earth from elsewhere in the universe.

PART II: THEORIES OF EVOLUTION

13. According to the theory of evolution as proposed by Charles Darwin, which one of the following is the most important driving force of evolution? (2003)

- A. Mutation
- B. Over – reproduction
- C. Genetic recombination
- D. Natural selection

14. Which one of the following modes of natural selection was responsible for the fast increase in the number of the black form of moths in Europe during Industrial Revolution? (2003)

- A. Stabilising selection
- B. Disruptive selection
- C. Normalizing selection
- D. Directional selection

15. From which of the following sources did Charles Darwin get the idea that selection can change living organisms? From: (2003)

- A. the work of plant and animal breeders.
- B. his observation of the Galapagos birds.
- C. the evolution theory of Lamarck.
- D. the book by Malthus.

16. Which of the following statements is consistent with the concept of the gene pool? (2003)

- A. Species with large gene pool have low potential of adaptation.
- B. Endangered species usually have small gene pool.
- C. Large gene pool is a hindrance for livestock improvement.
- D. Species with large gene pool are prone to disease.

17. Which of the following ideas is **NOT** a part of Darwin's Theory of Evolution? (2004)

- A. Over reproduction
- B. Use and disuse of body parts
- C. Existence of heritable variation
- D. Competition for scarce resources

18. What are the most likely causes of variations within species? (2005)

- A. Mitosis and asexual reproduction
- B. Overpopulation and overproduction
- C. Vegetative propagation and cloning
- D. Mutations and sexual reproduction

19. Which of the following theories explains evolutionary changes of living things in terms of changes in their allele frequencies? (2005)
- A. Darwin's natural selection
 - B. Spontaneous generation
 - C. Inheritance of acquired characteristics
 - D. Neo-Darwinism
20. Which one of the following factors is **NOT** important for evolutionary change of a population? (2005)
- A. Over reproduction
 - B. Insufficiency of natural resources
 - C. Existence of heritable variation
 - D. Survival of all that are born
21. According to Lamarck's theory of evolution, what is the mechanism by which evolving organisms acquire new structures? (2006)
- A. Mutation
 - B. Hereditary variation
 - C. Use and disuse of parts of the body
 - D. Recombination of ancestral genes
22. Why is it that mutations are considered as one of the raw materials of evolution? (2007)
- A. They contribute to new variations in organisms.
 - B. They are usually related to the environment in which they appear.
 - C. They are mostly beneficial to the organisms in which they appear.
 - D. They usually become the causes for species extinction.
23. Which of the following expression is more related to the phrase "survival of the fittest"? (2007)
- A. Natural selection
 - B. Mendelian inheritance
 - C. Gene mutation
 - D. Inheritance of acquired characteristics
24. Why are mutations considered important in evolution? (2008)
- A. They are usually related to the environment.
 - B. They contribute to new variations in organisms.
 - C. They are always beneficial to the organism.
 - D. They become causes for species migrations.
25. How many years have passed since Darwin's book on the theory of evolution was published? (2008)
- A. About 50 years
 - B. About 160 years
 - C. About 120 years
 - D. About 100 years

26. In his theory of evolution, the cause of which of the following concepts was **MISSING** in Darwin's explanation? (2008)
- A. Over-reproduction
 - B. Struggle for survival
 - C. Hereditary variation
 - D. Survival of the fittest
27. Which of the following factors brings about changes both during evolution and breeding of plants and animals? (2009)
- A. Limited resources
 - B. Production of excess progeny
 - C. Selection
 - D. Competition
28. Lamarck's theory of evolution is known as: (2010)
- A. inheritance of acquired characters
 - B. natural selection
 - C. survival of the fittest
 - D. mutation theory
29. Which one of the following is the primary contribution of Darwin to biological theory? (2010)
- A. New alleles arise through mutation.
 - B. An important mechanism of biological evolution is natural selection.
 - C. Evolution is the change in gene frequencies over time.
 - D. Genes are the units of inheritance.
30. In which of the following ways does mutation contribute most to evolution? (2010)
- A. It preserves adaptive genes.
 - B. It forms a new gene pool.
 - C. It helps genes to recombine.
 - D. It creates new alleles.
31. Which of the following combinations is known as Neo-Darwinism? (2010)
- A. Natural selection and Mendelian law of inheritance
 - B. Natural selection and acquired inheritance
 - C. Acquired inheritance and Mendelian law of inheritance
 - D. Natural selection and Lamarck's theory of evolution

32. On which of the following points do Lamarck's and Darwin's theories of evolution agree? (2011)
- A. Evolution occurs by natural selection
 - B. Evolution produces new species
 - C. All living things tend to over reproduce
 - D. New structures arise by use-and-disuse
33. Which of the following concept is attributed to Charles Darwin? (2011)
- A. In the struggle for existence, the fittest would survive.
 - B. Every cell must come from a pre-existing cell.
 - C. Use and disuse of organs is of great importance in evolution.
 - D. The gametes will carry only one of a pair of contrasting characters.
34. Which one of the following phenomena supports Darwin's concept of natural selection in organic evolution? (2011)
- A. Development of transgenic animals
 - B. Prevalence of pesticide resistant insects
 - C. Production of 'Dolly', the sheep by cloning
 - D. Development of organs from 'stem cells' for organ transplantation

PART III: THE EVIDENCE FOR EVOLUTION

35. Carbon 14 has a half-life of about 5730 years. Suppose a fossil contains only 12% of the amount of carbon 14 normally present in living organisms, how old is the fossil? (2004)
- | | |
|----------|----------|
| A. 5730 | C. 17190 |
| B. 11460 | D. 22920 |
36. Which of the following is true about the evolutionary origin of groups of organisms? (2004)
- A. The dinosaurs appeared before the origin of the land plants.
 - B. The earliest *Homo sapiens* appeared before the flowering plants.
 - C. The first photosynthetic organisms appeared before the oldest eukaryotes.
 - D. The first animals appeared before the formation of free O₂ in the atmosphere.

37. Why are fossils of soft-bodied organisms usually relatively rare in the environment? (2004)
- A. They are generally small in size.
 - B. Their bodies decompose readily.
 - C. They all lived in environments where sedimentation did not occur.
 - D. They were never common in environments in which they lived.
38. What does the structural similarity between the flippers of whales and arms of humans show? (2004)
- A. Whales evolved from the human species.
 - B. Whales are older than the human species.
 - C. The human species began life in the oceans.
 - D. Whales and humans had a common ancestry.
39. Which of the following pairs of molecules can give information about how much two species are evolutionary related to one another? (2004)
- A. DNA and proteins
 - B. Starch and cellulose
 - C. Lipids and carbohydrates
 - D. Carbohydrates and proteins
40. What is the specialist in biology called if he/she studies fossils to generate new knowledge on the origin and evolution of living things of past geologic periods? (2005)
- A. Geneticist
 - B. Ecologist
 - C. Paleontologist
 - D. Comparative Biochemist
41. When two species are compared, which of the following sources of evidence is least informative about the degree of relationships between the species? (2005)
- A. Nucleotide sequence of DNAs
 - B. Amino acid sequences of proteins
 - C. Glucose sequence of polysaccharides
 - D. DNA – DNA hybridization
42. Which of the following characteristics can show the evolutionary relationships among organisms? (2005)
- A. Structures having similar functions
 - B. Structures having same size
 - C. Structures having common origin
 - D. Structures having different origins

43. In which geologic period does the fossil record show more diverse and relatively higher forms of organisms? (2005)
- A. Devonian
 - B. Cretaceous
 - C. Jurassic
 - D. Permian
44. Which of the following can be taken as case for evidence of evolution from the field of plant & animal breeding? (2006)
- A. Artificial breeding always creates new species.
 - B. Artificial breeding only produces new organisms with higher yield
 - C. Artificial breeding shows that natural selection can produce variations
 - D. Artificial breeding can produce new variations in organisms
45. If a radioactive substance that weighs one kilogram has a half-life of 100 years, what would be the percentage of the substance left after 300 years? (2006)
- A. 50
 - B. 30
 - C. 25
 - D. 12.5
46. What do you call structures that have the same evolutionary origin but are different in structure or have different functions? (2006)
- A. Endemic
 - B. Analogous
 - C. Homologous
 - D. Indigenous
47. The half-life of carbon-14 is about 5730 years. If a fossil is 17200 years old, about what percent of its original carbon-14 is still present in the fossil? (2006)
- A. 75%
 - B. 50%
 - C. 25%
 - D. 12%
48. Which of the following pairs are analogous structures? (2006)
- A. Wing of a bird & wing of a butterfly
 - B. Front leg of a horse & a human arm
 - C. Wing of a bird & wing of a bat
 - D. Front leg of a frog & wing of a bat

49. Which of the following conclusions can be drawn from the structural similarities observed between the flippers of whales and the arms of humans? (2006)
- A. The human species began life in the ocean
 - B. The human species and whales share a common ancestry
 - C. Whales are older than the human species
 - D. Whales have evolved from early humans that went back to the ocean
50. From evolutionary point of view, which of the following animals is expected to have haemoglobin proteins that are least similar to that of human? (2007)
- A. Ape
 - B. Cow
 - C. Chicken
 - D. Frog
51. If a substance that weighs 2,000 grams and has a half-life of 100 years is left with only 250 grams, for how long has the radioactive decaying activity been undergoing? (2007)
- A. 200 years
 - B. 250 years
 - C. 300 years
 - D. 500 years
52. Suppose a fossil initially contains 100,000 atoms of a certain radioactive element whose half life is 10,000 years, after how many years would the number of the atoms be 12500? (2007)
- A. Ten thousand years
 - B. Twenty thousand years
 - C. Thirty thousand years
 - D. Forty thousand years
53. Based on similarity in number of amino acids found in haemoglobin, which one of the following animals has closer phylogenetic relations to human beings? (2008)
- A. Chicken
 - B. Protozoa
 - C. Bacteria
 - D. Algae
54. What do you call structures that have the same evolutionary origin even though they may now have different structural make ups or functions? (2008)
- A. Endemic
 - B. Analogous
 - C. Homologous
 - D. Indigenous

55. Which of the following pairs are **ANALOGOUS** structures? (2008)

- A. The human arm and the front leg of a mule
- B. The front leg of a frog and the wing of a bat
- C. The wing of a bird and the wing of a butterfly
- D. The wing of a bat and the wing of a bird

56. Which of the following can be understood about living things from the study of how breeders improve domesticated plants and animals? (2008)

- A. Living things tend to over-reproduce
- B. Natural resources are of limited supply
- C. Living things can be improved through selection
- D. Individuals compete for resources

57. Which of the following do biologists consider ancestral to the higher organisms of today? (2009)

- | | |
|-------------|-------------|
| A. Plantae | C. Fungi |
| B. Animalia | D. Protista |

58. Which of the following characteristics can show the evolutionary relationships among organisms?(2009)

- A. Structures having similar functions
- B. Presence of analogous structures
- C. Presence of homologous structures
- D. Structures having different origins

59. Which of the following features do analogous structures mostly share? (2010)

- | | |
|----------------------------|-----------------------------|
| A. Phylogenetic similarity | C. Ancestral similarity |
| B. Functional similarity | D. Developmental similarity |

60. Based on differences in DNA, which of the following animals is closer to human beings? (2010)

- | | |
|-----------------|---------------------|
| A. Frog | C. Zebra fish |
| B. Domestic pig | D. Domestic chicken |

61. Which of the following organic molecules is least informative about the evolutionary relationship between species? (2010)
- A. RNA
 - B. Proteins
 - C. Carbohydrates
 - D. DNA
62. One of the following sources of evidence provides a more direct support to the process of Charles Darwin's theory of evolution. (2011)
- A. Genetics
 - B. Anatomy
 - C. Physiology
 - D. Geographical distribution
63. If a radioactive substance that weighs 5,600 grams and has a half-life of 100 years is left with 700 grams, for how long has the decaying activity been undergoing? (2011)
- A. 100 years
 - B. 300 years
 - C. 200 years
 - D. 500 years

PART VI: THE PROCESSES OF EVOLUTION

64. In spite of their ability to form hybrids when mated, which one of the following factors is more important to keep the horse and the donkey as separate species? (2003)
- A. Their hybrid is not viable.
 - B. Their hybrid is sterile.
 - C. They cannot form hybrid zygotes.
 - D. They are ecologically isolated.
65. Which one of the following is most important for speciation to occur? (2003)
- A. Hybridization among populations.
 - B. Isolation of the gene pool.
 - C. Migration between populations.
 - D. Free flow of genes between populations.
66. Animals without close evolutionary relations are sometimes seen to have similar structures adapted for the same function. Which evolutionary principle is illustrated by this observation? (2003)
- A. Convergent evolution
 - B. Divergent evolution
 - C. Sympatric evolution
 - D. Allopatric evolution

67. Which of the following descriptions is true about the action of selective pressure in populations?

Selective pressure that acts: (2003)

- A. around the mean value is stabilizing
- B. around the mean value is disruptive
- C. at both ends of the distribution is directional
- D. at one ends of the distribution is stabilizing.

68. What is the most probable selection pressure responsible for the evolution of green skin colour in frogs inhabiting tropical rainforests? (2004)

- | | |
|-----------------|---------------------------|
| A. Climate | C. Infection by pathogens |
| B. Reproduction | D. Predation |

69. What is the reproductive isolating mechanism called if two species of frogs do not interbreed because they cannot understand the mating calls of one another? (2005)

- | | |
|-------------------------|--------------------------|
| A. Seasonal isolation | C. Temporal isolation |
| B. Behavioral isolation | D. Isolation by distance |

70. Among the following, which one is the best criterion to show that two populations belong to same species? (2005)

- | | |
|-----------------------------|--|
| A. Morphological similarity | C. Inhabiting the same geographic area |
| B. Physiological similarity | D. Production of fertile offspring |

71. If a new mutant allele arises in a certain population, which of the following factors determines if the allele is going to be adaptive or non-adaptive? (2005)

- A. The environment in which the population lives
- B. The rate at which the gene mutates
- C. The population in which the gene is found
- D. The use and disuse of the gene by the population

72. What kind of natural selection is at work in a situation where individuals at both extreme ends of the range get better survival advantages than those around the middle? (2005)

- | | |
|--------------------------|--|
| A. Stabilizing selection | C. Disruptive selection |
| B. Directional selection | D. Selection that removes the extremes |

73. Which of the following is prevented from taking place if populations are separated by a geographic barrier? (2006)
- A. Mutation
 - B. Evolution
 - C. Gene flow
 - D. Natural selection
74. Which of the following is an evolutionary requirement for two sub-populations of a species to evolve into independent species? (2007)
- A. Free exchange of genes
 - B. Geographic isolation
 - C. Free migration between populations
 - D. Absence of natural selection
75. What does an evolutionary selective pressure that acts around the mean do? (2008)
- A. It stabilizes.
 - B. It terminates.
 - C. It converges.
 - D. It disrupts.
76. Which of the following reproductive isolating mechanisms keeps the horse and donkey as two independent species? (2009)
- A. Hybrid inviability
 - B. Hybrid infertility
 - C. Ecological isolation
 - D. Habitat isolation
77. Which of the following was the most possible mode of evolution by which the many species of Darwin's finches evolved on the Galapagos islands?(2009)
- A. Phyletic evolution
 - B. Divergent evolution
 - C. Convergent evolution
 - D. Sympatric evolution
78. Which of the following species isolating processes could lead to the evolution of a new species by the mechanism known as sympatric speciation?(2009)
- A. A river that changed its course for many years
 - B. A new mountain range that was created many years ago
 - C. Populations of a species having different breeding seasons
 - D. A land mass that separated two water bodies for many years.
79. For which of the following can divergent evolution be taken as an alternative name?(2009)
- A. Allopatric speciation
 - B. Adaptive radiation
 - C. Sympatric speciation
 - D. Disruptive selection

80. Which of the following is the result of the similarity observed between the wings of a bird and a pterodactyl? (2009)
- A. Convergent evolution
 - B. Directional selection
 - C. Stabilising selection
 - D. Divergent evolution
81. In the process of allopatric speciation, which of the following is the mechanism that prevents populations from exchanging genes? (2010)
- A. Polyploidy
 - B. Seasonal isolation
 - C. Geographic barrier
 - D. Temporal isolation
82. The evolution of a species which is based upon the sum total adaptation changes could be preserved by: (2010)
- A. isolation
 - B. speciation
 - C. natural selection
 - D. human conservation
83. What is the possible cause or isolating mechanism for the formation of allopatric species? (2010)
- A. Seasonal isolation
 - B. Temporal isolation
 - C. Geographical isolation
 - D. Behavioural isolation

PART V: THE EVOLUTION OF HUMANS

84. To which genus of human-like organisms does Lucy belong? (2004)
- A. The genus Homo
 - B. The genus Ardipithecus
 - C. The genus Sahelanthropus
 - D. The genus Australopithecus
85. Which of the following fossils is the nearest to the common ancestor of the hominids and the apes? (2004)
- A. *Homo habilis*
 - B. *Homo erectus*
 - C. *Ardipithecus ramidus*
 - D. *Australopithecus afarensis*
86. In which hominid species did scientists find the smallest brain size (cranial capacity)? (2005)
- A. *Homo sapiens*
 - B. *Homo habilis*
 - C. *Homo erectus*
 - D. *Homo neanderthalensis*
87. Among the following fossil hominid species, which one is the oldest of all? (2006)
- A. *Homo erectus*
 - B. *Ardipithecus ramidus*
 - C. *Australopithecus afarensis*
 - D. *Australopithecus africanus*

88. Which of the following is consistent with the understanding of human evolution? (2007)
- A. Bipedalism was never important in human evolution.
 - B. Larger brain size had no contribution to the evolution of the human species.
 - C. Human ancestry had no relation whatsoever with that of the chimpanzees.
 - D. Fossils of Lucy and Ardi provided evidence for human origin.
89. Which of the following changes that happened during human evolution had the most contribution to the evolutionary success of *Homo sapiens*? (2008)
- A. Proportionately big brain size to body mass
 - B. Big body parts and big overall body mass
 - C. Long legs, arms and more upright body posture
 - D. Fast running ability and overall physical strength
90. Choose the one that had LEAST contribution to human evolution? (2008)
- A. Development of bipedalism
 - B. Adaptation to flight
 - C. Attaining opposable thumb
 - D. Increasing brain size
91. Which of the following played an important role in the evolution of human being?(2009)
- A. Emergence of wings in addition to limbs
 - B. Development of even toes in the forearms
 - C. Development of feathers and hollow bones
 - D. Development of opposable thumb to grasp
92. To which genus of primates are the Neanderthal humans classified? (2010)
- A. The genus *Homo*
 - B. The genus *Ardipithecus*
 - C. The genus *Australopithecus*
 - D. The genus *Zinjanthropus*
93. In which geologic period is the evolution of humans most probably believed to have happened? (2011)
- A. Tertiary period
 - B. Jurassic period
 - C. Cretaceous period
 - D. Quaternary period

94. Among the following, which one had the cranial capacity of about the same size as that of *Homo sapiens*? (2011)

A. The Neanderthal man

C. Lucy

B. *Homo habilis*

D. *Homo erectus*

Answers For Evolution UEE Questions (2003 – 2011)

1. A	25. B	49. B	73. C
2. B	26. C	50. D	74. B
3. B	27. C	51. C	75. D
4. B	28. A	52. C	76. B
5. C	29. B	53. A	77. B
6. B	30. D	54. C	78. C
7. C	31. A	55. C	79. B
8. B	32. B	56. C	80. A
9. A	33. A	57. D	81. C
10. B	34. B	58. C	82. C
11. A	35. C	59. B	83. C
12. C	36. C	60. B	84. D
13. D	37. B	61. C	85. C
14. D	38. D	62. D	86. B
15. B	39. A	63. B	87. B
16. B	40. C	64. B	88. D
17. B	41. C	65. B	89. A
18. D	42. C	66. A	90. B
19. D	43. B	67. A	91. D
20. D	44. C	68. D	92. A
21. C	45. D	69. B	93. D
22. A	46. C	70. D	94. A
23. A	47. D	71. A	
24. B	48. A	72. C	