

AS-2955 (B)

Model Answer

B.A/B.Sc.- (Hon's) (First Semester)

Examination- 2013

Anthropology and Tribal Development

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

Paper-I: Introduction to Physical/Biological anthropology

Full marks: 30

Passing Marks: 12

Note: Attempt questions of all two sections as directed. Distribution of marks is given with sections.

Section A

(Multiple choice questions)

Q1) Select the correct answer from the options: 10 x 1= 10

I). Who gave the theory of Pangenesis?

i) Charles Darwin; ii) A. Weismann; iii) Washburn; iv) None of the these

Answer: a

II) Homo erectus was found during which epoch;

i) Oligocene; ii) Miocene; iii) Pleistocene; iv) Pliocene

Answer: c

III). Who is the father of modern physical anthropology?

i) J. F. Blumenback; ii) J. G. Herder; iii) Washburn; iv) None of the these

Answer: c

IV) Great apes are mainly found in;

i) Asia; ii) Europe; iii) Africa; iv) America

Answer: c

V) Who is the father of physical anthropology?

i) J. F. Blumenback; ii) J. G. Herder; iii) Washburn; iv) None of the these

Answer: a

VI) Who discover Australopithecus africanus?

i) Raymond Dart; ii) Donald Johanson; iii) Weisman; iv) None of the above

Answer: a

VII) Who gave the hypothesis 'Prodigality of reproduction'?

i) Lamarck; ii) Darwin; iii) Linnaeus; iv) None of the above

Answer: b

VIII) Who gave the 'Theory of Catastrophism'?

i) Lamarck; ii) Cuvier; iii) Darwin; iv) Mivart

Answer: b

IX) Which fossil ape is known as the missing link between man and ape?

i) Homo erectus javanensis; ii) Homo habilis; iii) Australopithecus; iv) Ramapithecus

Answer: a

X) Who discovered Homo-habilis?

i) Eugene Dubois; ii) Leaky; iii) Raymond Dart; iv) Lewis

Answer: b

Section B: Long answer type questions (Attempt any Four) (4 x 5= 20)

Q2. Answer: Steps to be followed:

1. Brief introduction about Lamarck.

2. Two Hypothesis of Lamarck:

a. Use and disuse of organ (Brief explanation with example)

b. Inheritance of acquired character (Brief explanation with example)

3. Conclusion

Q3. Answer. It is the steady process of change from homogeneous to heterogeneous one life in course of time.

It is the name given to the theory proposed by Charles Robert Darwin (1809-1882). It is also known as the Theory of Natural Selection. He formulated this theory along with another English biologist, Alfred Russel Wallace (1823-1913) in the year 1858.

This theory is the result of enormous amount of natural history collected by Charles Darwin on different species of plants and animals, during his voyage on the ship - H.M.S Beagle which lasted for about 5 years (1831-1836).

The theory was greatly influenced by the book "Essay on Population" by Thomas Malthus, which underlined the competition between species for obtaining food. Darwin has given a vivid explanation of his ideas on evolution in the book "On the Origin of Species by means of Natural Selection or Preservation of Favored Races in Struggle for Life" published in 1859. The theory of natural selection is based on the following principles.

Steps to be followed:

1. Brief introduction about Darwin.

2. Five Hypothesis of Darwin:
 - a. Prodigality of Reproduction (brief explanation with example)
 - b. Survival of the Fittest (brief explanation with example)
 - c. Biological Variation (brief explanation with example)
 - d. Struggle for Existence:
 - i. Interspecific
 - ii. Intraspecific
 - iii. Environmental
(brief explanation with example)
 - e. Origin of new species (brief explanation with example)

3. Drawbacks and criticism of Darwinism

Q4. Answer: Physical Anthropology is the branch of anthropology that deals with the study of biological evolution and biological variation synchronically and diachronically.

Modern physical anthropology is the branch of anthropology that deals with the study of biological evolution, biological variation, biological growth and biological development of human being synchronically and diachronically.

Physical anthropologist relies extensively on population genetics to study human diversity. The human races are now best considered as Mendelian population which is centered round a purely genetic concept. Because of this integrated biology-oriented approach of the present day physical anthropology it is thought desirable to call it biological anthropology. (Brief explanation and example of latest development of biological anthropology).

Q5. Answer: It is the gradual process of change from simple to complex form of life in course of time.

1. Brief introduction about Charles Robert Darwin.
2. Explain briefly the five principles followed to explain the process of evolution:
3. Drawbacks and criticism of Darwinism

Q6. Answer: The Synthetic Theory of evolution or Modern Synthetic emerged around the middle of the 20th century from the ideas of three authors specialized in different branches of the evolution: Theodosius Dobzhansky in genetics, Ernst Mayr in the species of living beings and George G. Simpson in the great categories of the organisms.

The Modern Evolutionary Synthesis has incorporated the latest advances of science in biology and genetics. If the neo-Darwinism or neo-Darwinian Theory explicitly incorporated the random variations or mutations within the population, the Synthetic Theory of evolution incorporates the random variations or mutations of the genetic

information and accepts this mechanism as part of the evolution that, together with the mechanism of the natural selection, produce evolution as a whole.

The diversification emerges slowly, usually through gradual changes, and originates in the specialization. Therefore, it is part of the Gradualism trend as the initial Theory of Darwin.

The basis of this theory was provided by Dobzhansky in his book ‘Genetics and Origin of Species’ while the designation ‘Synthesis Theory’ was proposed by Huxley. Though many other scientists like Muller, Fisher, Wright, Mayr, etc. have contributed a lot other the final shape of the ‘modern Synthetic Theory of Evolution’ was given by Stebbins.

There are five basic factors involved in the process of organic evolution. These are (i) Gene mutation, (ii) Chromosomal mutation, (iii) Genetic recombination, (iv) Natural selection and (v) Reproductive isolation while the first three factors provide genetic variability; the last two are responsible for giving a direction to the evolutionary process.

Accessory Processes:

Besides the five factors described, there are two accessory processes as follows:

1. Migration and Hybridization:
2. Genetic Drift:

Concerning the evolutionary leaps and Modern Synthetic Theory, the controversy is currently present because of the fossil registry, about which there is not a clear position within the scientific community. (Explain briefly all factors).

Q7. Answer:

Characters	Catarrhine	Platyrrhine.
NOSTRILS	Downfacing nose (or catarrhine) Nostrils are closer together and open downward or forward (Apes and humans share this nasal feature as well.)	Flat nosed (or platyrrhine) Nostrils are far apart and open to the side
PREMOLARS and MOLARS	Two premolars Premolar in the mandible is SECTORIAL. That is, it's specialized for sharpening the upper canine Molars have sharply connected cusps	Three rather than two premolars Molars are relatively large The last molar is comparatively small or sometimes absent
EAR REGION	Tympanic membrane connected to external ear by a bony tube (is visible on the outside of the skull)	Tympanic membrane connected to external ear by a bony ring

HANDS	<p>Thumbs are rotated and more opposable, more like ours (Hanuman langurs, baboons)</p> <p>(Thumbs reduced or absent among colobine monkeys of Africa)</p> <p>Fingernails and toenails are present on all digits</p>	<p>Thumb orientation lies in line with other digits. Opposes the next digit in a scissorslike grip (Spider monkeys have lost their thumbs)</p> <p>Fingernails = some species have fingernails on big toe</p>
HABITATS	<p>Tolerate a wider range of habitats, from rainforest through savanna fringe or open savanna to high mtn ranges and semiarid regions even urban environments (remember the hanuman langurs).</p> <p>Many spend some or most of day on the ground</p> <p>Some species (leaf-eaters) have specialized digestive tracks for processing low-value food</p>	<p>Confined to arboreal habitats</p> <p>Rely heavily on fruit and less on foliage in comparison to Old World monkeys</p>

Q8. Answer: a. Evolutionary trend: Evolutionary trend is the change in the pattern of growth of different parts of an organism in an environment across generation. It is often leads to the specialization of an organism.

Example: Horse evolution i.e., from Eohippus----- Mesohippus----- Merychippus -----Equas (Present day horse).

But, it is not always provides the specialization for an organism it also leads to the extinction of an organism (beyond the adaptive stage), example: Sabre tooth tiger.

In human evolution examination of hominid remains indicates several trends, including changes in posture, cranial capacity (brain size), and facial angle. Such trends are often misused, e.g. in popular illustrations, to give the impression that evolution has proceeded in a linear manner, from some primitive ancestor through a series of descendants, to culminate in our own species. It's important to remember that the evolutionary history of humans, as of most organisms, is best reconstructed as a bush, where there are often several related species in existence at any one time. Other morphological features that show evolutionary trends are: Reduced sexual dimorphism, Changes in size of ribcage:

b. Humans and many other mammals have unusually efficient internal temperature regulating systems that automatically maintain stable core body temperatures in cold winters and warm summers. In addition, people have developed cultural patterns and technologies that help them adjust to extremes of temperature and humidity. Example: In very cold climates, there is a constant danger of developing hypothermia, which is a life threatening drop in core body temperature to subnormal levels. The normal temperature for humans is about

98.6° F. (37.0° C.). However, individual differences in metabolism , hormone levels, physical activity, and even the time of day can cause it to be as much as 1° F. (.6° C.) higher or lower in healthy individuals. It is also normal for core body temperature to be lower in elderly people. Hypothermia begins to occur when the core body temperature drops to 94° F. (34.4° C.). Below 85° F. (29.4°C.), the body cools more rapidly because its natural temperature regulating system (in the hypothalamus) usually fails. The now rapid decline in core body temperature is likely to result in death.

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