

**Model Paper\_AS-2959(B)**  
**B.A/ BSc. Third Semester**  
**End Semester Examination, 2013**  
**ANTHROPOLOGY**

*Paper: First (Introduction to Prehistoric Archaeology)*

*Time Allowed: Three hours*

**Section – ‘A’**

**1.5x10=15**

1. Select the correct answer from the options:
- (i) Which one is the correct sequence of geological era?
- Archaeozoic- proterozoic-palaeozoic-mesozoic-cenozoic**
  - Proterozoic-palaeozoic-mesozoic-cenozoic- archaeozoic
  - Palaeozoic-mesozoic-cenozoic-archaeozoic- proterozoic
  - Cenozoic-archaeozoic- proterozoic-palaeozoic-mesozoic
- (ii) Who wrote the book ‘Prehistory & Protohistory in India & Pakistan’?
- V.Gordon Childe
  - S.C Roy
  - H.D. Sankalia**
  - None of the above
- (iii) Which one is the correct sequence of tool typology?
- Core tool-flake tool-blade tool-polished tool**
  - Flake tool-blade tool-polished tool-core tool
  - Blade tool-polished tool- core tool-flake tool
  - Polished tool- core tool-flake tool-blade tool
- (iv) Which one is the correct sequence of pluviation?
- Kageran-Kamasian-Kanjeran-Gamblian**
  - Kamasian-Kanjeran-Gamblian- Kageran
  - Kanjeran-Gamblian- Kageran-Kamasian
  - Gamblian- Kageran-Kamasian-Kanjeran
- (v) Who wrote the book ‘Stone age tool’?
- V.Gordon Childe
  - S.C Roy
  - H.D. Sankalia**
  - Marvin Harris
- (vi) Prehistory is the branch of archaeology that study:
- Societies that has no written documents
  - Societies that has written documents
  - Both a & b**
  - Neither (a) nor (b)
- (vii) C. J. Thompson classified the cultural ages into
- Stone age, Bronze age, Iron age**
  - Stone age, Copper age, Iron age

- c. Stone age, Copper age, Bronze age,
- d. none of the above

- (viii) Glaciation takes place in
- a. Tropical region of the earth
  - b. Temperate region of the earth
  - c. Both a & b**
  - d. none of the above

- (ix) A tool is
- a. an artifact
  - b. A material evidence
  - c. stone only
  - d. both a & b**

- (x) Study of literate civilizations of the past is known as
- a. Classical archeology**
  - b. Pre-historic archeology
  - c. Protohistoric archeology
  - d. All the above

**Section-‘B**

**4x7.5=30**

**Note:** Write long answer of the following questions. Attempt any **four** questions.  
Each question carries 7.5 marks.

2. What is prehistoric archaeology? Describe the scopes of prehistoric archaeology in details.

**Answer 2:**

**Prehistoric archaeology**

Prehistoric archaeology investigates human prehistory; that is the periods of time in a region before the art of writing developed. Many anthropological archaeologists study societies that did not leave behind any written records and whatever we know about prehistory is simply through physical archaeological finds. Prehistoric archaeology uses material remains to reconstruct prehistoric life ways and studies contemporary peoples by comparing to those of ancient peoples.

For example, by studying the ways of life of present hunter and gatherer societies, prehistoric archaeologists can gain insights into the ways in which the ancient foraging peoples lived.

Some of the important prehistoric sites include Olduvai Gorge, Tanzania; Sunbury Earth Rings, Australia; Stonehenge, England; Lascaux, France; Bhimbetka, India; Iwajuku,

Japan; and Barton Gulch, United States. Prehistory has been classified into Palaeolithic, Mesolithic, Neolithic, and Chalcolithic periods, on the basis of the developments that took place over a period of time in the human lifestyles. Prehistory also includes periods before the lithic age (stone age), which preceded the existence of humans.

### **Scope of Archaeological Anthropology**

Archaeologists study human cultures and behavior through material remains. Many archaeological methods are also important to physical anthropologists who study early human evolution through fossilized human bones and associated tools and environmental evidence. Archaeology is one part of anthropology that spans the natural sciences, social sciences, and humanities, because archaeologists share research techniques with geologists, biologists, chemists, historians, economists and cultural anthropologists. Most archaeologists focus on a set of specific research questions about human cultures in the past. Modern archaeology is frequently multidisciplinary with collaboration of numerous specialists. These include geoarchaeologists, archaeobotanists (who study plant remains from archaeological sites), zooarchaeologists (who study animal bones), palynologists (who study microscopic pollen), lithic specialists (who study the raw material, manufacture, and use of stone tools) and many others. Classical and historical archaeologists (and occasionally prehistorians) will also often collaborate with architects, historians, and art historians.

Archaeologists use these remains to understand and re-create all aspects of past culture, from the daily lives of ordinary people to the grand conquests of emperors. Often, these objects are buried and have to be carefully uncovered or excavated before they can be studied. In many cases, they are the only clues archaeologists have to help them reconstruct the lives of ancient people. These objects are like pieces of a giant jigsaw puzzle that the archaeologist must solve.

Archaeology helps us to appreciate and preserve our shared human heritage. It informs us about the past, helps us understand where we came from, and shows us how people lived, overcame challenges, and developed the societies we have today.

The focus of archaeology has changed over the years. Archaeologists today study everything from ancient pots to DNA to theories of cognitive processes. This expanded scope of archaeology has necessitated the creation of many new interpretive approaches and recovery techniques.

Ethno archaeologists study people living today and record how they organize and use objects. The study of modern behavior can help reveal how and why people in the past left behind certain types of remains in certain patterns. Environmental archaeologists help us understand the conditions that existed when the people being studied were alive. Experimental archaeologists reconstruct techniques and processes used in the past to create artifacts, art, and

architecture. Underwater archaeologists study material remains that survive underwater, including shipwrecks and sites inundated by a rise in sea level. Others, working in the field of cultural resource management, assess archaeological remains at construction sites in order to record critical information and preserve as much as possible before the site is destroyed or covered over.

3. Write short note on

a. Relationship of Archaeology with history

b. Ethnoarchaeology

**Answer 3a:**

The word “Archaeology” is derived from Greek ‘archaios’ meaning “ancient” and ‘logos’ meaning “knowledge”, it has been therefore variously defined as “the study of antiquity, the science of ancient things”.

### **Relationship of Archaeology with history**

Archaeology often greatly helps in reconstructing history. In fact it is the only source for the reconstruction of the human past in the prehistoric times. Though we find ample number of written records for reconstruction of the historical period, they may not always present a full view of the past happenings. There would be a number of missing links in the history, which have to be reconstructed for a better understanding of the human past. Archaeology comes to the risk by supplying information to fill these gaps. Apart from filling gaps in the information available, archaeology also helps in correcting the information obtained through the written records. Most of the written records contain eulogical phrases which many a time proved to be wrong. For example most of the inscriptions describe a king as ‘Maha Rajadhi Raja’, ‘Raja Paramesvara’, ‘chakravartin’ etc., which on verification prove to be highly exaggerated.

Apart from helping in the reconstruction of political history, archaeology also helps greatly in studying social history, providing an insight into the common man and his ways of life. Usually written records made by him. They do not mention anything about the common man and the failures of the rulers. In such situations information collected by archaeological means are very useful. Another advantage of the information obtained through archaeological means over the written records is the authenticity of the information. The archaeological information being direct evidence is indisputable. Thus archaeology greatly helps in reconstructing the human past both of prehistoric and historic times.

**Answer 3b:**

### **Ethnoarchaeology**

This may be regarded as an aspect of prehistoric archaeology. It is an approach to ethnographic analogy in which archaeologists make their own observation of the contemporary cultures rather than relying on information provided by cultural anthropologists.

4. What is Pleistocene epoch? Write about the plio-pleistocene boundary.

**Answer 4:**

**Pleistocene epoch**

Pleistocene is known as the age of man. Pleisto' means most and Koinos' means new. This term first used by Charles Lyell, a geologist. This period is characterized by drastic changes in the environment. The homogenous warm climatic conditions characteristics of pre-Pleistocene epoch were no more seen in Pleistocene epoch. Pleistocene epoch was marked by Arctic ice region, temperate Europe and warmth Africa. In this period, the climatic change from warmth to cold and cold to warmth were noticed. Due to this climatic variation, it is known as Great Ice-age.

Pleistocene period commenced some 30 lakh years ago. The Pleistocene period corresponds to the long history of palaeolithic culture. The conditions during the Pleistocene period are not uniform and there occurred several drastic changes during this period. In general pleistocene period was a cold period, during which large areas of earth were covered by thick sheets of ice, and hence this period is called "ice age". In fact there were not one, but four ice ages during the Pleistocene period. They are Gunz (600,000), Mindel (400,000), Riss (200,000), and Wurm (100,000).

**Pliocene-Pleistocene boundary:**

Till recently it was thought that the Pleistocene epoch was one million years old and that the first glaciation occurred immediately after the epoch began. Regarding this there was no general agreement and thus this led to the confusion. In this process, deposits of similar age had been described by some workers as those of upper Pliocene, while some others have assigned them to lower Pleistocene. It was in 1912 that Haug defined Pleistocene as that epoch which yielded the evidence of mammals of one or more of genera, Elephas, Equus or Bos. This suggestion was supported and recommended for adoption by International Geological Congress held in London in 1948. A faunal assemblage of this kind is generally identified as Villafranchian. Villafranchian is recognized as a period of time which began about 3.5 million years ago. The term Villafranchian was used originally in Europe for the rock laid down on the land after that time and before the large scale continental glaciations.

As a consequence of this, change in the limit of Pleistocene, the interpretations that put man in upper Pleistocene had to be revised and placed in lower Pleistocene period. It is now generally accepted that the total duration of the Pleistocene divisions is more than three times of what was put forth earlier. The Villafranchian stage of the Pleistocene according to the present thinking includes pre-Gunz glaciation.

5. Write short note on

a. Faunal evidences

b. Prehistory and Protohistory

**Answer 5a:**

**Faunal evidences**

Faunal evidence is one of the chief evidences of Pleistocene. The end of Pliocene epoch and beginning of Pleistocene period was marked by the appearance of marine foraminifera

species called *Hyalineapaltrica* which has been taken as a scale. The existence of this sea animal found in marine section of Calabria at a place called Le Castella in Italy indicates the plio-pleistocene boundary. The Calabria has been correlated with the mammalian fauna of Villafranchian stage. The animal species of Villafranchian are found in plio-pleistocene boundary are *Elephas*, *Meridionalis*, *Dicerorhinus*, *Etruscus*, *Equus*, *Stenonis*, *Trogantherium*, *Curverii* and *Dicerorhinus megarhinus*.

By the Mindel glacial time, there were two new species called *Dicrith Krichbergensis-merckii* and a woodland variety called *D.Hemitoechus*. After Ester glacial period, a woolly rhinoceros species called *Ceolondonta trickhorhinus antiquitatis* appeared in Asia and migrated to Europe as shown by the fossil evidence. During Mindel-Riss inter glacial a deer species called *Dama Clactoniana* became extinct in Britain. In the last inter-glacial Riss-Wurm a deer species *Damadama* appeared. And so on.

The animals of Villafranchian stage in North Africa are *Mastodon*, *Anancus Osiris*, *Elephas Africanus*, *Stylohipparion lidicum*, *Equus namadicus*, *Libytherium marusium*, *Machairodus*, *Antelope*, *Gazello* etc.

In India, in Siwalik strata animal fossil evidences were also found indicating plio-pleistocene boundary. On the basis of nature and fossil evidences, the Siwalik deposits are classified as Lower (Chinzi zone), Middle (Nagari and Dhokpathan zones) and Upper (lower tatrot zone). The animals of tatrot zone are *Hipparion*, *Merycopotamus*, and *Proamphibos* with *Camelus*, *Leptobos* etc. By the time of formation of pinjore zone Villafranchian stage, *Hipparion*, *Proamphibos* became extinct and *Equus*, *Rhinoceros* appeared. On the basis of extinction of animal species by the end of the tatrot zone and appearance of new animal species in the pinjore zone of Villafranchian stage, plio-pleistocene boundary in India has been recognized.

### **Answer 5b:**

#### **Prehistory and Protohistory**

Archaeology involves reconstructing history with the help of material remains. It is a stimulating job of interpreting material culture in human terms. It is thus a subject having a multidisciplinary approach, that include history, anthropology, and other social and general sciences wherein every small thing matters.

On the basis of historic time period, Prehistory that deals with archaeology called as Prehistoric archaeology and Protohistory that deals with archaeology is called as Protohistoric archaeology are discussed.

#### **Prehistoric archaeology**

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### **Protohistoric Archaeology**

Some major protohistoric sites include Sammallahdenmäki, Finland; Harappa and Mohenjo Daro, Pakistan; Dholavira, Lothal and Kalibangan, India; Ur, Iraq; Gonur Depe, Turkmenistan; Memphis, Egypt; and Cornwall, United Kingdom. Protohistory is the period that lies in between prehistory and history. Though this is a period that came after the invention of writing, many of the evidences have not been deciphered yet. Protohistory encompasses the Bronze Age and Iron Age, and sometimes even the copper age, but this differs from region to region. Dating of this period is a difficult task for an archaeologist, as this again depends on regional and cultural aspects. It was during the protohistoric period that great ancient civilizations of the world sprang up, and the world took its first and prominent steps towards urbanization. Thus, it is an important transitional phase, and sites are loaded with surprising artifacts, which makes protohistoric archaeology an interesting option.

6. What is absolute dating technique and briefly describe any three methods of dating?

#### **Answer 6:**

Archaeological investigations have no meaning unless the chronological sequence of the events are reconstructed faithfully. The real meaning of history is to trace the developments in various

fields of the human past. Towards this end, while investigating the past cultures, archaeology depends on various dating methods. These dating methods can broadly be divided into two categories, i.e. 1) Relative dating methods and 2) Absolute dating methods.

### **Absolute dating technique**

When the date of pre-historic materials is expressed in absolute or actual years, it is called as absolute method of dating. This is also known as direct method of dating because in this method associated finds are dated directly and date is determined in absolute years. There are a number of methods by which absolute dating of archaeological materials are done. These are as follows:

#### **1. Dendrochronology**

Dendrochronology is a method that uses tree-ring analysis to establish chronology. A major application of dendrochronology in archaeology, as a tool for establishing dates from the samples of wood and articles made out of wood is not only in working out primary chronologies but also in cross checking the already known dates by other methods. This method makes it possible to date individual ruins to within a year, or even a season in which they were built. Often, the tree-ring analysis from a site can give strong clues about the length of occupation, certain periods of building or repair activities at the site. Another application of tree-ring analysis is the inference of past environmental conditions, which is extremely useful to the archaeologists.

The modern science of dendrochronology was pioneered by A.E. Douglass in 1904. Tree ring analysis is based on the phenomenon of formation of annual growth rings in many trees, such as conifers. These rings are shown by the trees growing in regions with regular seasonal changes of climate. As a rule trees produce one ring every year. The annual ring is formed by the 'cambium' which lies between the old wood and bark. When growing season (rainy season) begins, sets of large, thinly-walled cells are added to the wood. As the season advances towards the end of the season, the cells added to the wood become increasingly smaller and more thickly walled. This process repeats in the following years also.

The formation of rings is affected by drought and prosperous seasons. In the years with unfavourable weather the growth rings will be unusually narrow. On the other hand, during years with exceptionally large amounts of rain the tree will form much wider growth rings. Most of the trees in a give area show the same variability in the width of the growth rings because of the conditions they all endured. Thus there is co-relation between the rings of one tree to that of another.

Further, one can correlate with one another growth rings of different trees of same region, and by counting backwards co-relating the inner rings of younger trees with the outer rings of older trees we can reconstruct a sequence of dates.

Scientists have prepared a sort of calendar for the last three thousand years. By comparing a sample with these calendars or charts we can estimate the age of that sample. Thus it is possible to know the age of the wood used for making furniture or in the construction work.

The main disadvantage with the system is that, we require a sample showing at least 20 growth rings to make an objective estimation of its age. Hence smaller samples cannot be dated. This method can date



the sample upto the time of cutting the tree, but not the date when it was actually brought into use. Still more serious defect is that, the system is liable to give earlier dates, when the wood from the inner core of the trunk is used.

## **2. RADIOCARBON OR C-14 DATING**

This is one of the most important methods of dating the ancient objects which contain some carbon in them. This method was discovered by Prof. Willard F. Libby in 1946, which won him Noble Prize in Chemistry. This method has achieved fame within a short time largely because it provides chronology for the prehistoric cultures, when we do not have written records.

This method is based on the presence of radio-active carbon of atomic weight 14 in organic matter. Cosmic radiation produces in the upper atmosphere of the earth Neutron particles, some of which hit the atoms of ordinary Nitrogen. This is captured by the nucleus of the nitrogen atom, which gives off a proton and thus changing to Carbon-14. This Carbon-14 in turn is radio-active and by losing an electron reverts to nitrogen. This creation of new carbon atoms and then reverting to nitrogen has achieved a state of equilibrium in the long duration of the earth's existence. C-14 along with the carbondioxide enter the living organisms in the process of photosynthesis, and all the radiocarbon atoms that disintegrate in living things are replaced by the C-14 entering the food chain. Thus the process of radio carbon present in the living organism is same as in the atmosphere.

It is further assumed that all living animals derive body material from the plant kingdom, and also exhibit the same proportion of C-14 material. Therefore as soon as the organism dies no further radiocarbon is added. At that time the radioactive disintegration takes over in an uncompensated manner. The C-14 has a half-life of about 5730 years, i.e. only half the C-14 will remain after the half-life period. In the disintegration process the Carbon-14 returns to nitrogen emitting a beta particle in the process. The quantity of the C-14 remaining is measured by counting the beta radiation emitted per minute per gram of material. Modern C-14 emits about 15 counts per minute per gram, whereas Carbon-14 which is 5700 years old, emits about 7.5 counts per minute per gram.

## **3. Potassium – argon dating**

Potassium (K) is one of the elements that occur in great abundance in the earth's crust. It is present in nearly every mineral. In its natural form potassium contains a small fraction of radio-active material. For each 100 radio-active potassium atoms that decay 89% form calcium and 11% become Argon, one of the rare gases. During rock formation, especially lava, tuffs, pumice, etc. Virtually all argon that had accumulated in the parent material will escape. The process of radio-active decay of potassium continues and the argon accumulated again which when measured will give a clue as to the age of the rock. This method has dated samples which are 4.5 billion years to 2500 years old.

The application of this method to archaeology depends on locating the widespread distribution of localities that have recently (in the last half-million years) experienced volcanic activity forming layers over the culture-bearing deposits. The city of Pompeii in Italy is a good example of the destruction caused by volcanic activity. This method is more useful in dating the prehistoric sites. The starting phase of the Palaeolithic period in India is pushed back by atleast one million years from the earlier dating of about 5 lakh years B.C to 1.4 million years B.C. This unique example comes from a site known as Bori in

Maharashtra, where it was found that a layer yielding flake tools is overlain by a layer of volcanic ash. When this ash was subjected to Potassium-Argon dating it yielded a date of 1.4 million years, thus suggesting that the tools found below this ash are older than 1.4 million years.

7. What is glacial period and explain the various stages involved in glacial and interglacial periods?

**Answer 7:**

A glacier is a large mass of ice that has been created by the compression of snow that has piled up over many years. Usually the ice is slowly moving downhill from the area of snow accumulation. As it descends to a lower altitude temperatures get warmer and warmer and tend to melt it away.

Glacial periods are large portions of the earth's surface were covered with thick glacial ice sheets. In the Pleistocene epoch, in the carboniferous and Permian periods of the palaeozoic era and in the Huronian time of the Precambrian, the earth experienced an overall cooling of the climate, resulting in great ice sheets covering great portions of the oceans and continents. Glacial periods owed its first impetus to the Swiss-American naturalist Louis Agassiz, whose conception of Pleistocene glaciation was presented in his address before the Helvetic society (1837) and in his *Etudes Surles glaciers* (1840). The concept of progressive cooling lost its validity with the existence when earth became warm.

### **Stages in Glacial and Interglacial**

As stated earlier, in the year 1909, Penck and Bruckner established Alpine-Glacial cycle. They established four glacial ages namely Gunz, Mindel, Riss and Wurm as followed by three Interglacials periods Gunz-Mindel, Mindel-Riss and Riss-Wurm. They discovered that second Interglacial period was longer than the other two Interglacial periods. That is why they named Second Interglacial period as the great Interglacial period. With the discovery of Donau glaciation, Villafranchian fauna and Basal Pleistocene in recent years, five glacial periods and four interglacial periods, like Donau, Gunz, Mindel, Riss and Wurm. The four interglacial stages of glaciation are Donau-Gunz, Gunz-Mindel, Mindel-Riss, Riss-Wurm.

The phenomenon of glacial may be described as increased precipitation in atmosphere which led to snow formations at high levels and accumulation at poles. The soft snow on accumulating started melting at lower levels due to pressure and solidified into ice. This simultaneously led to a viscous fore which moved the ice forward and away from zone of glaciations. Thus, large boulders and terrestrial materials were carried along with this moving mass of ice. The climate during this phenomenon was extremely cold and varied from dry to wet.

**Note: We can draw the diagrammatic representation of glacial and interglacial periods respectively.**

8. Distinguish between the methodology involved in Thermoluminescence and Stratigraphy.

**Answer 8:**

### **Absolute dating technique**

When the date of pre-historic materials is expressed in absolute or actual years, it is called as absolute method of dating. This is also known as direct method of dating because in this method associated finds are dated directly and date is determined in absolute years. There are a number of methods by which absolute dating of archaeological materials are done.

### **Thermoluminescence dating of pottery**

The dating of ancient pottery by Thermoluminescence measurements was suggested by Farrington Daniels of the University of Wisconsin in America (1953). This method can date ancient pottery with an accuracy of plus or minus 10%.

Thermoluminescence is the release in the form of light of stored energy from a substance when it is heated. All ceramic material contain certain amounts of radioactive impurities (uranium, thorium, potassium). When the ceramic is heated the radioactive energy present in the clay till then is lost, and fresh energy acquired gradually depending on the time of its existence. The thermoluminescence observed is a measure of the total dose of radiation to which the ceramic has been exposed since the last previous heating, i.e. in the kiln. For calculating dates the sample is heated upto 5000C and thermoluminescence observed as a glow is measured with very sensitive instruments. The glow emitted is directly proportional to the radiation it received multiplied by the years.

### **Relative Dating Methods**

This dating method is also known as “Archaeological Dating” or “Historical Chronology”. These are mainly non-scientific dating methods. These methods were relied on especially prior to the introduction of scientific methods of dating. But, even when the scientific methods of absolute dating are available, this method of dating has not lost its importance, as many a time we have to depend solely on relative dating. Even when the absolute dates are available, we have to supplement the information with relative dating. The various methods of relative dating are;

### **Stratigraphy**

This method depends on the common observation that the height of the habitational area increases as the people continue to live at the same place. The deposit thus occurring forms layers depending on the nature of the material brought in by the people inhabiting the area. According to this method, the upper deposits are younger and the lower deposits are older. Basing on this principle, the cultural assemblages found in different layers can be assigned a chronological personality. For example, if the cultural contents of the lower deposit are Mauryan in character, appropriately this deposit may be assigned a date between 400-200 B.C. Similarly, if the cultural equipment of the upper deposit is of the Sunga period, this deposit has been place between 200-73 B.C.

This method, however, has some disadvantages. In practice it is found that the mounds are disturbed by all sorts of pits and dumps. Quite often, the archaeologist decided the change of stratum on the basis of the “feed” of the deposit. In such cases subjective element cannot be ruled out. But, for a single culture site the method is quite reliable.