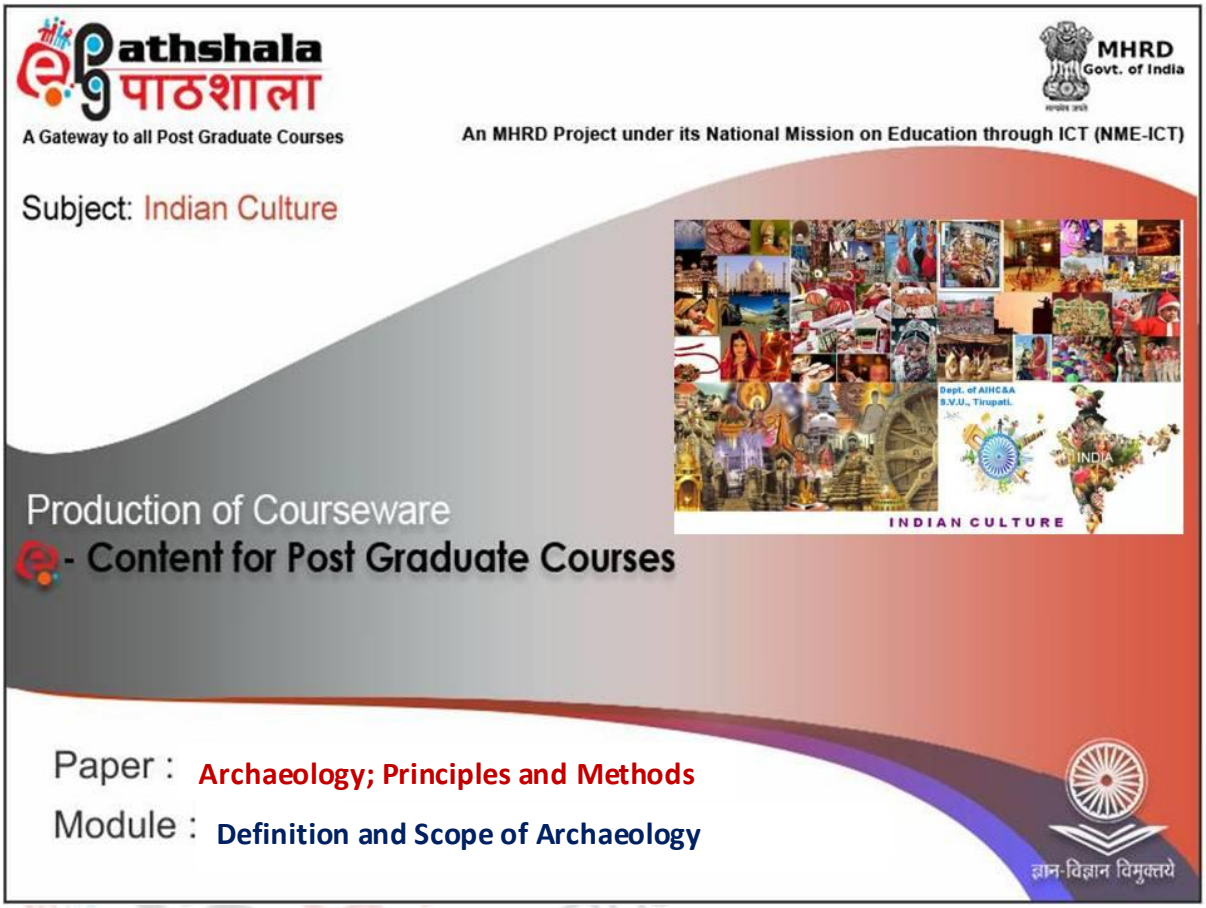
Component-I (A) – Personal details:



Component-I (B) – Description of module:

Subject Name	Indian Culture
Paper Name	Archaeology; Principles and Methods
Module Name/Title	Definition and Scope of Archaeology
Module Id	IC / APM / 01
Pre requisites	
Objectives	
Keywords	Archaeology / Anthropology / ethnoarchaeological / Human past

E-Text (Quadrant-I):

1. Introduction

The main focus of archaeology is the study of human past that deepens our understanding of the world in a more meaningful and resourceful manner. The study of human past means the study of human behavioural and cognitive systems within a given socio-politico-cultural context. The human behavioural activities could be discerned through material evidences whereas the cognitive systems could be realised by understanding the cultural values that stand behind the material. To get a coherent picture of human behavioural and cognitive systems, archaeology has developed certain methodological approaches in collaboration with various specialized scientific fields. The specialized scientific fields such as physical, chemical, biological, anthropological, mathematical, geological, computer sciences, remote sensing and many more such allied scientific fields, in addition to the humanities and social sciences such as history, art, architecture, language, linguistic and religious studies are increasingly playing a greater role to decipher the human foot-prints in a more reliable manner. The intellectual tie-ups with scientific disciplines have facilitated in solving several research problems. All traditional and scientific approaches basically depend upon the nature of material evidences that are being unearthed by the archaeologists through well planned explorations and excavations.

1.1 Collections and Interpretations

The collection and interpretation of material remains are so important in archaeological studies. These are conditioned by two important means, yet interrelated areas, namely *methods* and *theories*. The way archaeological research is being conducted or the way the material remains are being collected and studied could be interpreted as *method.* Thus, the means of collection of maximum retrievable information are known as *archaeological method*. Theory means an idea or a set of ideas intended to explain facts or events. In archaeological context, the way the collected material remains are being interpreted to explain a particular event or series of events of the past can be called as *archaeological theory.* A method or theory followed in a particular context may become irrelevant in another context. Therefore, archaeologists design their research method to suit the needs of the problem of study. Both the *archaeological method* and *theory* play a dominant role in our understanding of the human past. There are several methods of collections of data since the nature of material evidences that are embedded in the soil in varied ecological zones differs. In the same way, the interpretations of the archaeological material also vary depending upon

the nature of theoretical approach. Thus, the reconstruction of the past basically stands on these two workable platforms of intensive academic field of inquiry viz., *theory* and *method*.

The study of material remains of the ancient culture and civilization reminds us cultural continuity. The cultural continuity, discontinuity, integration and transformation are part of cultural process that are conditioned by various factors. The long-felt field experience advocates that domain knowledge plays a dominant role in understanding a particular culture. In the backdrop of field experience, archaeologists must take utmost care in the application of theories and methods in the interpretation. Archaeologists must be flexible, open-minded and receptive in their approach. Due to ever-growing field of science and technology, the study of archaeology has become more complex and responsive. Several established methods and theories are being constantly questioned and revised due to advances in science and technology. The progress made in science and technology sometime forces us to refashion our approach towards archaeology. As one experiences today, the development of science and technology in the past also must have played a greater role in changing the activities of the ancient society at large. For instance, the introduction of iron or development of water management system or navigational techniques must have changed the society at large. The researchers in the field of archaeology should approach each problem with open-mind and they must prepare to accept the outcome of the result that may even go against their wishes. The archaeologists must have a physical strength and mental ability to withstand the biological strain in the field and intellectual stress in the analysis at the laboratory. Thus, the duty of archaeologists is to discover, document, decode, describe, discuss, determine, disseminate and declare the results of findings for the advancement of knowledge on ancient society, to full-fill the aspiration of the contemporary society and to provide a good guidance to the future generation.

2. Definition and Scope

The term archaeology is derived from the Greek word. In Greek, *archaeos* means ancient and *logos* means discussion, reason or science. Thus, archaeology is a science involving the study of human past through material remains. It methodically and meticulously studies to obtain a complete picture of human behavioural and cognitive systems. In short, archaeology is the study of human behavioural and cognitive systems to understand the cultural changes or processes that happened in the past through material remains.

To understand the cultural process, archaeologists study all physical traces encountered both in excavations and explorations as movable and immovable objects and also tangible and intangible evidences. Among the physical remains, artefacts (portable human-made objects) occupy a primary position. Archaeologists try to discern the non-material life of the people through these movable and immovable objects. Archaeologists follow certain specific methods and a body of theories to get a comprehensive picture of the material and non-material life of the people.

In method, the focus is on the collection of data. In theory, the focus is on the interpretation or giving a better explanation on the collected material. In the past, archaeologists generally intended to give descriptive data to a site, but today, they apply theoretical systems for better interpretation of the data. In this attempt, they create certain conceptual basis to understand the human past. The human past has both a prehistoric (the period of human history before the advent of writing) and a historic antiquity (the period of human history after the advent of writing, preciously speaking after the decipherment of particular writing system). These historical moorings have gone through a slow process of biological evolution and cultural development. Human has lived on the earth in a particular social, physical and environmental context as one of the biological products. These contexts are dynamic and not static. In this dynamic process, the human use to live and leave their imprints in the form of material remains. These remains are generally observed in stratified deposits, which we

call it as cultural remains or culture. This culture is subject to change brought out by human in their adaptation to environment. These inherent changes are reflected in assemblages of artefacts. These assemblages are recorded and studied to show how this culture has been transmitted and adopted by others. Edward Tylor, an anthropologist, defined *culture* as 'knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by a man as member of the society" (Tylor 1871). These cultural pointers are stayed back as cultural deposits on a landscape.

Therefore, the whole landscape comprising several archaeological sites is a document and each archaeological site is a part of that document. Human interacted, both culturally and spiritually, with the landscape that are reflected in the form of settlements, architectural features, worshiping places, ritual spaces, burial monuments or in any human-made features. In certain cases, they collectively create a landscape such as sacred landscape. On certain occasions, the natural landscapes like mountains, caves, rivers and seas are considered as sacred landscape that are culturally associated in a more powerful manner. Beyond material evidences, certain natural substances are venerated as God in a particular belief system and these are culturally very explosive both in the past as well as in the present. Therefore, archaeologists must study the entire landscape with a specific goal to get an appreciable data for better interpretation and understanding.

3. Goals of Archaeology

Traditionally, archaeology has been equated with the discovery, recovery, inquiry, scrutiny, analysis and interpretation of the material remains of the human past. Now, goals of archaeology have been modified in an effort to learn more about relations between material culture and human behaviour. These goals stress the need to establish temporal and spatial controls on the materials under study. To achieve this, archaeologists have three principal goals (Sharer and Ashmore 1993:35).

These goals are:

- To consider the ***form*** of archaeological evidence and its distribution in time and space.
- To determine the ***function***of archaeological evidence and thereby construct models of ancient behaviour.
- To delimit the ***process*** of culture and determine how and why cultures change.

The first goal (***form***) is the description and classification of the material evidence to develop models of artefact assemblage distribution through time and space. The study of artefact assemblages helps to reconstruct the historical development of cultural changes by building local and regional sequences. For instance, Heinrich Dressel's classification of Roman amphorae could be cited as finest example (Dressel 1899). In India, the approximate date and cultural association of the sites are being recognized generally based on the ceramic sequences. Such artefact assemblages such as ceramics (like pre-Harappan, Harappan, Northern-Black-Polished ware (NBP), Painted Grey ware (PGW), rouletted ware and black-and-red ware (BRW)), stone tools (like core tools of Madras hand axes, pebble tools of Soan valley, flake tools and celts) and metal objects (copper hoards and Iron Age tools) were created in Indian context.

The second goal (***function***) focuses on the usage of various artefacts. This is done based on the study of *forms.* It assists to understand the ancient human behaviour in a given environment. The combined study of *forms* and *functions* helps us to reconstruct the past

environment through the study of ethnoarchaeological, palaeobotonical, archaeozoological, paleontological samples and many other subsistence patterns. For instance, the hand axes and cleavers encountered in Lower Palaeolithic culture and axes and adzes encountered in Neolithic culture reflect their function, subsistence pattern and also the past environment. The Lower Palaeolithic tools reflect the mode of subsistence pattern of the hunter-gatherer community that lived during Pleistocene period and the Neolithic tools echo the food producing society lived during Holocene period. The size and shape (i.e., *form*) of the tools determine their *function* which eventually determines the nature of subsistence patterns.

The third goal (***process-***the cultural process) is an attempt to understand the cultural change or process of change in a sequential or chronological order based on the study of tangible and intangible evidences. The study of cultural process is one of the major goals of new archaeology.

Cultural changes occur due to variety of reasons. The development of science and technology, spirituality, under exploitation or over exploitation of natural resources, change in environment, changes in social, political and economic structures, internal and external influences and many other such forces or pointers individually or collectively influence the cultural process. For instance, the introduction of metal technology like copper and iron, sea level fluctuations, river migrations, state formation or collapse, maritime contacts and identification of monsoon winds could be cited as some of the factors for the change in culture.

The various dynamics of cultural process cannot be understood without the involvement of various disciplines like history, anthropology, geology, biology, zoology, physics, chemistry, botany and many other interrelated sister disciplines. Thus, the inter-disciplinary studies play a vital role in archaeological interpretations. Understanding the crucial relationship that exists between archaeology and other disciplines is important to strengthen the study of human past and also to overcome certain deficiencies or discrepancies that erupt in the course of our interpretation.

4. Archaeology as Science

There is a continuous, vibrant academic debate whether to consider archaeology as a science or humanistic discipline or stands for both. Scholars argue that application of science and scientific methods in a particular discipline would not make that subject a science. They argue that the science is extensively used in archaeology, but it deals on human past, therefore it is a humanistic discipline and also part of history. One may see the archaeology and science going together, but it is very difficult to accept archaeology as a science. The scholars who counter this argument emphasize that, unlike in history, the evidences do not speak themselves, rather archaeologist make sense out of it. In this respect, the job of the archaeologist is rather like that of the scientist (Renfrew and Bahn 2000:12). Like scientists, archaeologists also collect data, conducts experiment, formulates a hypothesis, tests the hypothesis and summarize the results. Therefore, the scholars argue that archaeology is a science.

5. Archaeology and Science

There are two perceptions on archaeology and science. One is the contribution of science to archaeology and another is the contribution of archaeology to science. Some of the archaeologists generally hold the former view and fail to look into the mutual dependence. The contribution of archaeology to science is being increasingly felt in recent years. The independently dated early Palaeolithic tools collected in specific cultural and environmental deposits at Tikoda in Madhya Pradesh (Ota and Deo 2014:57-66), Attirampakkam in

Kortalaiyar valley near Chennai(Pappu 2011:1596-1599) and Isampur in Karnataka (Paddayya 2000:751-752),respectively dated to 1.7, 1.5 and 1.2 million years provided much needed information to geoscientists. Likewise, it is once assumed that the atmospheric ratio of C^{14} to C^{12} remains constant over-time (Libby 1955:8). In contrast to this assumption, the C^{14} dating of the known-age archaeological specimens led to the development of tree-ring based calibration curves (MASCA correction) (Taylor 1987:19-21). The animal bones, pollen, phytoliths and archaeo-botanical remains recovered from archaeological records help to the environmentalists and ecologists to reconstruct the bio-diversity. The sequence of genomes of ancient pathogens (such as the bacteria that causes leprosy and tuberculosis) recovered from ancient human skeletal remains paving the way to improved therapies. The analysis of wootz steel of south India and Delhi iron pillar may provide to good scope for future iron and steel technology. The hydraulic device (called *kumuli* (in Tamil) –sluice) used in tank irrigation reflects the water management system. Several such physical traces may help to understand various intricacies of science. Thus, archaeology contributes much for the development of science and science helps immensely for the advancement of archaeology. In the following chapter, the fruitful relationship that exists between archaeology and other social, physical, chemical, biological and geological sciences is highlighted.

6. Relevance of Archaeology

The duty of the archaeologists is to discover, document, decode, describe, discuss, determine, disseminate and declare the result of the findings of the facts to the society without any prejudice and personal benefit. Their findings must unite the humanity, remove the disparity, implant the scientific temper and advance the society in all spheres of human life. Many of the collectors and treasure hunters regard themselves as legitimate archaeologists and it is the curse of the archaeology today. Our ancestors with spiritual belief buried their riches to accompany them in the after-life. We, their descendants, exploit those riches to enrich ourselves. For instance, the Metropolitan Museum of Art in New York purchased one painted Greek vase looted from an Italian tomb by paying million dollars (Papa-Sokal 2011:2-8), though now it returned the vase to Italy. Several south Indian bronzes and sculptures were looted to meet the greed of the Museums of the developed countries without understanding that they were collecting a part of an endangered, rapidly vanishing and never be replaced cultural heritage of a particular community or nation. The archaeological excavation conducted by professional archaeologists also considered as scientific destruction, but they record with context and publish them for the advancement of humanity and open them to the scholarly world and to the general public without any personal benefit, a critical ingredient in scientific archaeology.

7. Past, Present and Future

All the societies have interest in the past to understand the present and to move forward in the future. All the members of the society are the stake-holders of the past and it is not the unique privilege of the archaeologists. Archaeologists must have the moral responsibility of presenting the past cultural values that embedded in the present cultural system and also to take forward of the future for better co-existence of multiple complex societies. How the past societies viewed their past is more important in archaeology. Majority of the written documents such as literature, inscriptions, copper plates, monuments and oral traditions were created, composed and engraved with an intension to record their past, to meet the aspiration of the present and to guide the future. The whole archaeological materials are the documents of the past, and they were the products of the ancient society, created intentionally or unintentionally in the past.

The great spectacular discoveries like Tikoda, Bhimbetka, Harappa, Mohenjadaro, Dholavira, Pataliputra and many other such discoveries created sensation in the minds of the people. Some are chance discoveries like Bhimbetka and some are after well-planned

research like the identification of Sanchi, Saranath, Kaveripattinam and Dwarka. Some are turned out to be a speculative. Several speculative statements need scientific validity and search for such validity is still-on in several nations. The course of Saraswathi river, the human-made bridge of Ramar Sethu, submerged cities of Dwarka and Kaveripattinam and the lost continent of *Kumarikandam* are some of the written or oral traditions that require material evidences validated by science. Our science took us to moon and sends spacecraft to probe Mars, but our collective understanding of human diversity and our ability to collaborate with others from different cultural backgrounds remains at an elementary level. We are in "identity crisis". We identify the people based on religion, caste, nation, language, geography, physical features and so on so forth. We tend to fear diversity, due to ignorance. Therefore, we must use archaeology as one of the educational weapons in the fight against such ignorance. The biological and cultural diversities are part of human history. These diversities should not be used as a political or social tool to attain short gains. We should reconstruct the history to unite the people and should not manufacture a history to divide the people. The past also has two types of history, namely created history and manufactured history but the present society must expose the true history for the benefit of all. We have to look at the past objectively, and we should not view the past through the spectrum of our present value system. In contrast, archaeological interpretations are increasingly taking a shape of both scientific and political. A "real" or "imagined past" is being constructed to get or change the public opinion. For instance, Africa is the abode of first human who appeared 2.5 million years ago, but her written history begins with the colonial rule. Which part of history is important, the long unwritten human history of 2.5 million years? or short written history of few centuries? Our goal is to reveal both.

In the recent years, archaeology has begun to receive the attention of rulers, political leaders and administrators, as the archaeological investigations begin to support the much needed economic development. The traditional medicine, science and technology help in several ways to mitigate the misery of the contemporary society. For instance, the sluice technology can be cited as an example. The sluice is a simple hydraulic device used in tank irrigation in dry zones of south India. There are several sluices dating back to 7^{th}-8^{th} centuries CE. Some of the sluices are still in use and have survived for more than a millennium. Its long survival itself stands as a proof of its worthiness. The rain harvesting system adopted at Dholavira in semi-arid zone of Rann of Kutch region of Gujarat could be cited as another example (Bisht 2000:11-23). One may cite several such examples. The increased food production through raised-field potato cultivation in Bolivia is the result of archaeological findings. Understanding the innovation of wootz steel, iron pillar, construction of dams, diversion of river waters, breathtaking monuments like Brihadiswara temple, Taj Mahal, the whispering gallery of Gol Gumbaz at Golkonda and other such technology involved architectural uniqueness can be used for national economic development. The Harappan cities followed underground drainage system but our contemporary, so called advanced cities, lack such sanitary awareness. The mud bricks used in order to overcome the extreme cold and hot climates in Indus civilization can be replicated today. Thus, the benefit of the archaeology or the nuisance of the archaeology depends upon our world view and our love towards humanity. Let us understand the past for prosperous future.