

Test Codes: RA I / RA II (short Answer Type) 2001
Junior Research Fellowship in Anthropology
Syllabus

The Candidates for Junior Research Fellowships in Anthropology will have to take two tests RA-I (Short Answer type) in the forenoon session and Test RA-II (Short Answer type) in the afternoon session.

The syllabus and sample questions for both RA-I and RA-II tests are as follows:

Syllabus for both RA-I and RA-II (tests)

Standard: M.Sc. with specialization in Physical/ Biological Anthropology of Indian Universities.

Part I (*Anthropology*)

1. *Introduction* : definition and scope; subdivisions of anthropology; inter-relationships between anthropology and other disciplines.
2. *Human Evolution* : theories of evolution; taxonomic principles; man's place in the animal kingdom; comparative anatomy of anthropoid apes; structural and functional specialisations of man; biocultural interactions.
3. *Man as a social animal*: choice of mate; monogamy; polygamy; exogamy; endogamy; inbreeding; family; clan; kingroup; social stratification and society; role of social factors in influencing genetic and environmental variations.

4. *Human variation and adaptation to environment*: causes of variation; short and long-term adaptation to different climatic, biotic and socio-cultural environments; genetic factors.
5. *Population variation and comparison*: historical background of infraspecific typological classification; classification of the Indian populations; traits used for population comparison (e.g., anthropometry, anthroposcopy, dermatoglyphics, genetic markers, etc.); biological distance.
6. *Demographic studies in anthropology*: basic concepts of demography (population structure, age and sex composition, fecundity, fertility, sterility, morbidity, mortality, marriage, family, migration, population growth); environmental determinants of demographic measures; anthropological demography.
7. *Applied anthropology* : Anthropometry; nutrition; growth, development and physique; population control; forensic anthropology; paternity diagnosis.

Part II (*Human Genetics*)

1. *Biological basis of inheritance* : cell; nucleus; chromosomes; DNA; RNA; genetic code; gene action; cell division; normal chromosome structure and number; functions of X and Y chromosomes; autosomal and sex chromosomal aberrations.
2. *Mendelian genetics* : Laws of Mendel; basic terminology (gene; allele; genotype; phenotype; homozygote; heterozygote; linkage; crossing over etc.); Mendelian inheritance (single factor inheritance; multifactorial inheritance; polygenic inheritance).

3. *Population genetics* : Hardy-Weinberg equilibrium; mutation; random genetic drift; selection; inbreeding; admixture; assortative mating; isolation; genetical structure.
4. *Distribution of polymorphic traits* : distributions; balanced and transient polymorphisms.
5. *Role of heredity and environment in human genetics*: different types of twins; twin diagnosis; heritability.
6. *Medical genetics*: genetic factors in common diseases; lethal and sublethal genes; medico-legal aspects of human genetics including paternity diagnosis and genetic counselling.

Part III (*Methodology*)

1. *Anthropological methodology*: pedigree; twin; anthropometric; biochemical; population; demography; dermatoglyphics; etc.
2. *Statistical methodology*: data representation - cross-classified tables, histograms, frequency polygons, pie charts, cumulative frequency distributions. Descriptive statistics - measures of central tendency, dispersion and association; simple hypothesis testing; correlation; regression; t and chi^2 - test. Frequency chi^2 and its applications in testing for homogeneity.

Sample Questions for RA-I

Answer should be very brief and precise

Full marks 100

Answer *question* No. 4 and any *five* from the rest

1. How would you define biological anthropology? Enumerate the recent trends in bioanthropological studies.
2. What are major stresses on man at high altitude? what are their major effects on human biological traits?
3. Define demography. Give an outline of the importance of demographic studies in anthropology.
4. Describe, with suitable examples the relationship between the process of modernization and human biological responses.
5. Discuss the synthetic theory of organic evolution.
6. Do you think that anthropological knowledge can be utilised in solving human problems? If so, illustrate your views with appropriate examples.
7. Why is racial typology no longer considered an useful concept in the study of human diversity? Discuss.
8. A theory describes demographic change in the following phases: The first phase - high fertility and high mortality; the second phase - high fertility and low mortality; the third phase – low fertility and low mortality. (a) What is the theory called? (b) Illustrate the theory diagrammatically providing suitable examples.
9. Make an assessment on the interaction between heredity and environment in controlling postnatal growth in humans.

10. Write short notes on any two of the following:

- (a) Paternity diagnosis
- (b) Social stratification
- (c) Hylobatidae
- (d) Somatotyping
- (e) Biotic environment
- (f) Mongoloid

Sample Questions for RA-II

Full Marks 100

Answer should be very brief and precise

Answer any *three* questions from Group A and *two* questions each from B and C.

CALCULATOR IS NOT ALLOWED

GROUP A

1. Illustrate the difference between Mitosis and Meiosis with diagrams and indicate their specific functions.
2. What are the criteria of Polygenic Inheritance? Does human body height satisfy these criteria? Indicate the effects of environment on human body height, if any.
3. What is the mode of inheritance of Hypertrichosis of the human ear rim? Illustrate your answer with a diagram.

4. What are the possible causes of distortion of segregation ratio? Why are recessive lethal genes more severe in their effects than dominant lethals?
5. How would you distinguish between : (a) Genotype and Phenotype; (b) Linkage and Crossing over; (c) Monozygotic and Dizygotic twins; (d) Sex-linked and Sex-limited traits? Cite appropriate examples for each case.
6. Write short notes on any two of the following : (a) Down's syndrome; (b) Genomics; (c) Thalassaemia; (d) Mitochondrial DNA.

Group B

1. Design a schedule appropriate for investigating blood pressures in relation to age, sex, body weight and stature in a rural population. Keep in mind that the investigation will look also into diurnal variation in blood pressure.
2. Describe the anthropometric methods for assessment of nutritional status in children.
3. Compare and contrast the Genealogical and Participant Observation Methods.

Or

Compare the merits and demerits of Twin and Pedigree methods.

Group C

1. 10 randomly selected college students were asked to state the number of hours they slept last night. The resulting data are : 5,6,6,8,7,7,5,8,6,12 Find: (a) The mean; (b) the median; (c) the

standard deviation; (d) the mode; (e) between the mean and the median, which one is greater? Explain why this was expected from the nature of data.

2. The following numbers represent a part of random number of table

2 6 7 1 4 6 9 0 1 5
5 0 2 2 6 2 2 5 9 7
8 0 3 4 0 7 8 5 2 9
7 8 4 4 0 9 0 2 3 7
9 1 1 1 0 2 5 0 3 2
7 5 7 5 1 9 9 7 4 0
4 5 7 7 2 0 6 4 0 2
8 6 3 3 9 8 1 3 4 8

Prepare a frequency distribution and histogram for this particular data. Does the histogram appear to confirm that the numbers are random (i.e. the expected frequency of each number between 0 and 9 is the same) or seem to contradict it?

3. Test at level $\alpha = .05$ if the numbers really come from a random number table where the expected frequencies of the digits 0-9 are all the same. The χ^2 critical value at $\alpha = .05$ and degrees of freedom 9 is 16.92.