

Pt. Ravishankar Shukla University, Raipur

M.A./M.Sc. ANTHROPOLOGY

Semester – III

(Group A: Physical Anthropology)

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July 2017-December 2017

M.A./M.Sc. ANTHROPOLOGY  
SEMESTER-III

**Paper I - Applied Anthropology (Group - A & - B)**

MAX. Marks- 80  
MIN. Marks - 27

Each Paper will have 40 **compulsory** questions, divisible into 4 sections.

- i) Section-A(Multi-Choice Questions): **20** questions of **1** mark each.
- ii) Section-B( Short Questions): **8** questions( two from each unit) of **2** marks each(word limit: 2-3 lines)
- iii) Section-C(Long Questions): **8** questions(two from each unit) of **3** marks each(word limit: 75words)
- iv) Section-D(Very Long Questions): **4** questions(one from each unit) of **5** marks each( word limit: 150 words)

**UNIT- I**

Meaning and Scope of Applied Biological Anthropology.  
Anthropology of Sports.  
Nutritional Anthropology.  
Designing of defence equipments.  
Defence Services.

**UNIT- II**

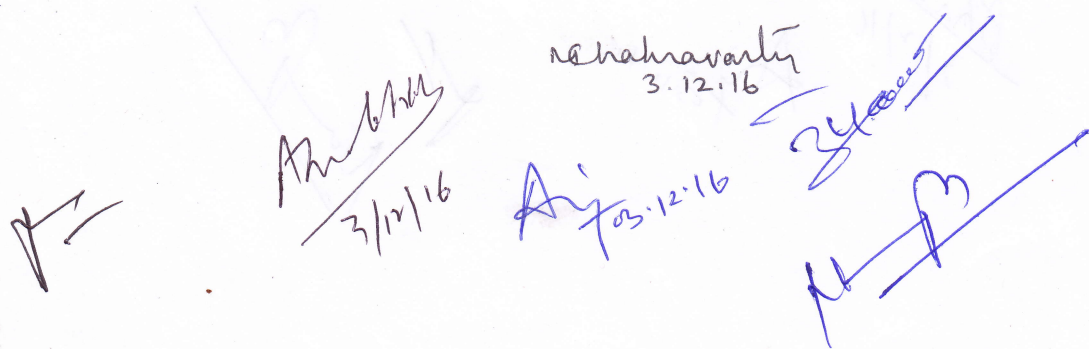
Applications of Human Genetics: Medico - Legal cases, Eugenics.  
Genetic screening, Genetic counseling, Genetic engineering.  
Human Genomics & its applications.

**UNIT -III**

Meaning & Scope of Applied Social Anthropology.  
Applied & Action anthropology.  
Applications of Anthropological theory and methodology in the field of tribal development.

**UNIT- IV**

Applied anthropology in industry.  
Applied anthropology in education.  
Applied anthropology in public health  
National health Mission.

  
The bottom of the page contains several handwritten signatures and dates in blue ink. From left to right, there is a signature with the date '3/12/16', a signature 'Rachhavarthy' with the date '3.12.16', a signature 'Aij' with the date '03.12.16', and another signature with the date '24/12/16'. There are also some other scribbles and marks.

### Recommended Readings:

1. Kroeber. Anthropology Today.
2. Curt Stern. 1968. Principles of Human Genetics. Eurasia Publishing House (Pvt.) Ltd., Ram Nagar, New Delhi-1 (India).
3. Steine. Biosocial Genetics.
4. Karp, E. Genetic Engineering.
5. Bodmer and Cavalli-Sforza. Genetics of Human Populations.
6. Backer, PT and Weiner (Eds), The Biology of Human Adaptability.
7. Beal, Virginia, Nutrition and the Life Span
8. Craig, Human Development
10. Eveleth, PB and Tanner, JM Worldwide Variation in Human Growth
11. Forbes, GB, Human Body Composition
12. Sodhi, HS, Sports Anthropology
13. Willigt, JV, Applied Anthropology: An Introduction
14. Stern, C., Principles of Human Genetics.
15. Shukla, B.R.K. & Rastogi, S., Physical Anthropology and Human Genetics An Introduction.
16. McKusick, V.A., Human Genetics.

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**M.A./M.Sc. ANTHROPOLOGY**  
**SEMESTER-III**  
**GROUP - A : PHYSICAL ANTHROPOLOGY**  
**Paper II - Advanced Human Biology**

MAX. Marks- 80  
MIN. Marks-27

Each Paper will have 40 **compulsory** questions, divisible into 4 sections.

- i) Section-A(Multi-Choice Questions): **20** questions of **1** mark each.
- ii) Section-B( Short Questions): **8** questions( two from each unit) of **2** marks each(word limit: 2-3 lines)
- iii) Section-C(Long Questions): **8** questions(two from each unit) of **3** marks each(word limit: 75words)
- iv) Section-D(Very Long Questions): **4** questions(one from each unit) of **5** marks each( word limit: 150 words)

**Unit-1**

Gene expressivity: Lethal genes, Sub-lethal genes, modifying genes, Co-dominance, Suppressor genes, Variable Penetrance in man. Sex determination in man,  
Dermatoglyphics-Identification, Topography, Finger prints pattern-identification, pattern intensity, Furuhashi and Dankmeijer's index  
Palmar Dermatoglyphics-Configurational areas, Main line formula and index

**Unit-2**

Probability.  
Hardy-Weinberg law, Testing Equilibrium, Applications of Hardy Weinberg Law in Human Population Genetics.  
Genetic Polymorphism: Concept, Transient and Balanced.  
Concept of Gene Pool and Gene Frequency.

**Unit-3**

Identification of Human Chromosomes, Chromosome Karyotype and nomenclature, Banding Techniques.  
Numerical-Turners Syndrome, Klinefelter syndrome, Triple X, Down Syndrome Patau's Syndrome, Edward's Syndrome  
Structural Chromosomal abnormalities-Deletion, Duplication, Inversion, Translocation  
Inborn errors of Metabolism: G6PD Deficiency, PKU, Alkaptonuria

**Unit-4**

Occurrence of Mutation: Mutation Rate- Direct and Indirect Method.  
Selection in Human Population, Selection Relaxation, Selection Leading to Changes in Gene Frequency and Selection leading to change in Genetic Equilibrium  
Inbreeding : Definition and Concept. Inbreeding with Pedigree  
Coefficient of Inbreeding, Genetic Consequences of inbreeding in Human Population  
Genetic hazards of radiation

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### Recommended Readings:

1. Crow & Kimura. 1970. An Introduction to Population Genetics Theory, Harper & Row Publishers, New York.
2. Curt Stern. 1968. Principle of Human Genetics, Eurasia Publishing House (Pvt.) Ltd., Ram Nagar, New Delhi-1 (India).
3. Li, C. C. Population Genetics, Chicago University Press, Chicago.
4. Baker, P.T. & Weiner (Eds.), The Biology of Human Adaptability.
5. Beal, Virginia, Nutrition and the Life Span.
6. Beutler, E., Red Cell Metabolism: A Manual of Biochemical Methods.
7. Bouge, D., Principles of Demography.
8. Brock and Mayo, The Biochemical Genetics of Man.
9. Burdette, W.J., Methodology of Human Genetics.
10. Craig, Human Development.
11. Dixit, M., Human Nutrition Principles and Applications in India.
12. Emery A.E.H., Elements of Medical Genetics.
13. Eveleth, P.B. & Tanner, J.M., Worldwide variations in Human Growth.
14. Giblett, E.R., Genetics Markers in Human Blood.
15. Li, C.C., Human Genetics
16. Malhotra, K.C. & ISHG, Calcutta, Statistical Methods in Human Population Genetics, IBRAD, ISI
17. Wright, S., Evolution and Genetics of Population
18. Stanfield, W.D., Theory and Problems of Genetics.
19. Burdette, WJ, Methodology in Human Genetics
20. Crow, J.F. & Kimura, M., An Introduction to Population Genetic Theory
21. Rothwell, N.V., Human Genetics.
22. Mange, J.E. & Mange, A.P., Basic Human Genetics.
23. Bhamarh, H.S. & Chaturvedi, C.M., A Textbook of Genetics.

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**M.A./M.Sc. ANTHROPOLOGY**  
**SEMESTER -III**  
**GROUP - A : PHYSICAL ANTHROPOLOGY**  
**Paper III – Human Growth and Nutrition**

**MAX. Marks- 80**  
**MIN.Marks - 27**

Each Paper will have 40 **compulsory** questions, divisible into 4 sections.

- i) Section-A(Multi-Choice Questions): **20** questions of **1** mark each.
- ii) Section-B( Short Questions): **8** questions( two from each unit) of **2** marks each(word limit: 2-3 lines)
- iii) Section-C(Long Questions): **8** questions(two from each unit) of **3** marks each(word limit: 75words)
- iv) Section-D(Very Long Questions): **4** questions(one from each unit) of **5** marks each( word limit: 150 words)

**UNIT – I**

Human growth and development: Pre-natal and Post-natal growth, infancy, Childhood, adolescence, adulthood, senility.

Human growth curves.

Basic methods of growth studies - Cross-sectional, Longitudinal, Mixed Longitudinal.

**UNIT – II**

Factors affecting growth: Heredity, Environment & hormonal.

Concept of age- chronological, skeletal, dental, morphological.

**UNIT – III**

Nutrition: Basic terms and concepts.

Concept of Balanced Diet, malnutrition, under nutrition, overnutrition, obesity etc.

Special problems related to growth and nutrition growth at risk: infants, pregnant and lactating mothers, old age problems,

birth weight variations; abnormal growth failure.

Evaluation of nutritional status through Anthropometric and Clinical signs of malnutrition.

**UNIT – IV**

Growth programmes ANP, ICDS, SNP, Mid-day meal programme; Vitamin-A prophylaxis programme, Anemia

prophylaxis programme, Goiter control programme, Nutritional deficiency diseases: Nicotinic acid deficiency, Vitamin-C,

Vitamin-D deficiency.

Problem of Malnutrition, morbidity and mortality in India.

IMR. Role of maternal education, Immunization programme in India

**Recommended Readings:**

1. Tanner, J. M. 1962. Growth at Adolescence, Blackwell Scientific Publications, Oxford.
2. Lowrey, G. H. 1978. Growth & development of children, Year book Medical Publishers, Chicago – London.
3. Swaminathan, M. 1985. Essentials of Food and Nutrition, The Bangalore Printing and Publishing Co. Ltd.

4. Gopalan, C., Rama Sastri, B., V. & Balasubremanian, S., C. 2002. Nutritive value of Indian foods, National Institute of Nutrition, ICMR, Hyderabad.
5. Parasmani dasgupta and Roland Hauspie , 2001. Perspectives in Human Growth, Development and Maturation, Kluwer Academic Publishers, London.
6. Marshall, W. A. 1977. Human Growth and its Disorders, Academic Press, London.
7. Harrison, G.A., Weiner, J.S., Tanner, J.M. and Barnicot, N.A. Human Biology: An Introduction to Human Evolution, Variation and Growth, Clarendon Press, Oxford.
8. Tanner, J.M., Fetus into Man.
9. Jelliff, D.B., Community Nutritional Assessment with Special Reference to Less Developed Countries.
10. Dixit. Human Nutrition: Principles and Applications in India.
11. Shanti, G. Nutrition and Child Care: A Practical Guide.
12. B. Srilaxmi, Nutrition Science.
13. Margart Schay, Nutrition.
14. Rao, V.K.R.V. Food Nutrition and Poverty.
15. Nelson, A Text Book of Pediatrics
16. Garrow, J.S. and James, W.P.T: Human Nutrition and Dietetics.
17. Swaminathan, M., Essentials of Food and Nutrition: Applied Aspect.
18. Eveleth, PB and Tanner, JM Worldwide Variation in Human Growth
19. Forbes, GB, Human Body Composition

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**M.A./M.Sc. ANTHROPOLOGY**  
**SEMESTER-III**  
**GROUP - A : PHYSICAL ANTHROPOLOGY**  
**Paper- IV Human Molecular Genetics**

**MAX. Marks- 80**  
**MIN. Marks - 27**

Each Paper will have 40 **compulsory** questions, divisible into 4 sections.

- i) Section-A(Multi-Choice Questions): **20** questions of **1** mark each.
- ii) Section-B( Short Questions): **8** questions( two from each unit) of **2** marks each(word limit: 2-3 lines)
- iii) Section-C(Long Questions): **8** questions(two from each unit) of **3** marks each(word limit: 75words)
- iv) Section-D(Very Long Questions): **4** questions(one from each unit) of **5** marks each( word limit: 150 words)

**UNIT -I**

Definition and scope of Molecular Genetics. Nucleic acid structure, Chemical and physical properties of nucleic acids, spectroscopic and thermal properties of nucleic acids.

DNA organization in chromosomes.: DNA structure, DNA replications.

RNA structure, Gene transcription in eukaryotes.,.

**UNIT-II**

Techniques in Molecular Genetics, Recombinant DNA technology: Restriction enzymes, Nucleic acid hybridization, DNA cloning, DNA sequencing, Polymerase chain reaction (PCR), Southern blot, Northern and Western blot, In situ hybridization, Labelling nucleic acid probes, Transgenic organisms.

**UNIT-III**

DNA Polymorphism DNA mutation and repair, Repetitive DNA, Gene mapping, Physical mapping, Genomic imprinting.. Expression of eukaryotic protein-coding genes. Genetic code and Protein synthesis. DNA Sequencing and fingerprinting

**UNIT-IV**

Application of Genomic Technology: RFLP (Restriction fragment length polymorphism), VNTR (Variable number tandem repeat), Microsatellite repair polymorphism, Application in forensic sciences, Human genome project, Prenatal diagnosis and Genetic Counselling of molecular disorders.

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### Recommended Readings:

1. Strachan, T. and Read, A.P. 1999. Human Molecular Genetics. BIOS Scientific Publishers Ltd, Oxford. (574.8732, STT H, 84237).
2. Jackson, M., Strachan, T. and Dover, G. 1996. Human genome Evolution. BIOS Scientific Publishers Ltd., Oxford. (573.2, JAM H, 79134).
3. Levis, R. 2003. Human Genetics Concepts and Application. 4<sup>th</sup> ed. Dubuque, IA: McGraw-Hill.
4. Koolman, J and Roehm, K.H. 2005. Color Atlas of Biochemistry. 2<sup>nd</sup> ed. Thieme Stuttgart. New York.
5. Lewin. 2003. Genes VIII. 1<sup>st</sup> ed. Prentice Hall.
6. McKusick, V.A. Human Genetics.
7. Rieger, R. et al., Glossary of Genetics – Classical and Molecular
8. Brock and Mayo, The Biochemical Genetics of Man
9. Winchester, A.M., Human Genetics.

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**M.A./M.Sc. ANTHROPOLOGY**  
**SEMESTER-III**  
**GROUP - A : PHYSICAL ANTHROPOLOGY**  
**Lab Course I – Practicals in Applied Biological Anthropology**

MAX. Marks- 80

MIN. Marks- 27

1. Collection of blood specimens.
- 2 Preparation of Hemolysates and serum & their storage.
3. Preparation & identification of Heme in Crystals.
4. Laboratory examination of blood and blood stains for criminal detection: Preliminary test, confirmatory test: Tiechmann test, Takayama test.
5. Teachniques of blood grouping: ABO blood group system Rh. blood group system & MN blood group system. Personal Identification by blood grouping.
- Calculation of gene frequencies.
6. Test of ABH saliva secretion.
7. Test of Hemoglobin determination in human blood.
8. Test for Sickle cell hemoglobin.
9. Test for Colour blindness P.T.C. taste sensitivity.
10. Examination of R.B.C. in Human Blood.
11. Examination W.B.C. in Human Blood.
12. Dermatoglyphics: Analysis of finger, palm, sole and toe prints
- 13 Isolation of DNA from human blood and personal identification by DNA markers.

**.NOTE:** Five specimens to be analyzed by each student in the above-mentioned traits unless stated otherwise.

**Recommended Readings:**

1. Race, R. R. & Sanger, R. 1968. Blood group in man. Blackwell Scientific Publications, Oxford. (612.11825, RAR).
2. Kathleen E. Boormen and Barbara E. Dodd. An Introduction to Blood group Serology (612.11825, BOK).
3. Bhasin, M. K. and Chahal, S. M. S. 1996 . A Laboratory Manual for Human blood Analysis, Kamla Raj Enterprises, Delhi.
4. Shrivastava, B. K. 1983. A Manual of Practical Physiology, Samit Medical Publications, Patna.
5. Dacie, J. V. and Lewis, S. M. 1991. Practical haematology, 5th edition, J. and A. Churchill, Livingstone.

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**M.A./M.Sc. ANTHROPOLOGY**  
**SEMESTER-III**  
**GROUP - A : PHYSICAL ANTHROPOLOGY**  
**Lab Course II - Practical in Human Growth, Nutrition & Physiology**

MAX. Marks- 80

MIN. MARKS-80

**Human Growth :**

Techniques of taking skinfold measurement: Biceps, Triceps, Sub-scapular, Supra-iliac.

Body Proportions.

Body Composition

Somatotyping

**Nutrition:**

Detection of nutritional status on the basis of body measurements

Nutritional Anthropometry: Ht/Age, Wt/Age/Wt/Ht.

Body Mass Index (BMI)

Waist/Hip Ratio

**Physiology:**

Examination of Pulse Rate

Determination of Blood Pressure

Determination of Vital Capacity

Hand Grip

**Recommended Readings:**

1. Jelliffe, D. B. & Jelliffe, E. F. B. Nutrition & Growth, New York, Plenum.
2. Swaminathan, M. 1985. Essentials of Food and Nutrition, The Bangalore Printing and Publishing Co. Ltd.
3. Gopalan, C., Rama Sastri, B., V. & Balasubramanian, S. C. 2002. Nutritive value of Indian foods, National Institute of Nutrition, ICMR, Hyderabad.
4. Falkner, F. & Tanner, J. M. Human Growth. Vols. I, II & III, Plenum Press, New York.
5. Jelliffe, D. B. The Assessment of the nutritional status of the community, WHO, Geneva.

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