

M.D.U., ROHTAK

A) Open Elective Courses

Students of all PG programmes under CBCS (w.e.f. 2017-18) are required to study one open elective course in each of the 2nd and 3rd Semesters for 2-Years Programmes and in each of the 4th and 5th semesters for 3-Years Programmes. They may choose any one of the following courses (excluding the courses offered by the departments of their own subjects, if not stated otherwise).

Open Elective Courses of 3rd Semester:-

Sr. No.	Nomenclature of the course	Course Code	Offered by the Department
1.	Computer Aided Drug Design	16BINO2	Bioinformatics
2.	Principles and Applications of Agriculture Biotechnology-II	16CBTO2	Biotechnology
3.	Principles and Applications of Biotechnology-II	16CBTO4	Biotechnology
4.	Human Health & Nutritional Disorders	16BCHO2	Bio-Chemistry
5.	Plants: Source of Food and Health	17BOTO2	Botany
6.	Fundamental of Income Tax	16COMO1	Commerce
7.	Study of War	16DSS22OE2	Defence & Strategic Studies
8.	Principles of Economics	16ECOO2	Economics
9.	Trends and Concerns of Teacher Education	16EDUO2	Education
10.	Disaster Management	16ENVO2	Environmental Science
11.	Food Fundamentals	16FTEO2	Food Technology
12.	Forensic Science	16GENO2	Genetics
13.	Introduction of Geography	17GEOO1	Geography
14.	Sources of Geographical Data	17GEOO2	Geography
15.	Bhartiya Sahitya	16HNDO1	Hindi
16.	Survey of Sources of Indian History	16HISO2	History
17.	Fundamentals of Marketing	16IMSO2	IMSAR
18.	Introduction of Mass Media	17JRMO1	Journalism
19.	Constitutional Law	16LAWO2	Law
20.	Information Sources and Literacy	16LISO2	Library & Information Science
21.	Statistical Tools using SPSS	16MATO3	Mathematics
22.	MATLAB	16MATO4	Mathematics
23.	Principles of Medical Biotechnology II	16MBTO2	Medical Biotechnology
24.	Microbial Technology for Entrepreneurship	16MCBO2	Microbiology
25.	Sources of Energy-II	16PHYO2	Physics
26.	Environment Protection Administration	16PUBO2	Public Administration
27.	Natural and Manmade Disaster	16POLO2	Political Science

28.	Indian Society	16SOCO2	Sociology
29.	Optimization Techniques	16STAO3	Statistics
30.	Wild Life and Conservation	16ZOOO2	Zoology

CENTRE FOR BIOINFORMATICS
M. D. UNIVERSITY, ROHTAK

CBCS-SCHEME OF EXAMINATION (M.Sc. -Bioinformatics)-2016-17 onwards

Course Title: Computer Aided Drug Design

Credit: 3 0 0

Course Code: 16BINO2

MM. Th 80+ IA 20

Time: 3 Hours

Note: In all 7 questions are to be set, Question No. 1 is compulsory and to be set covering entire Syllabus. 6 questions will be set with two questions from each unit. Students are required to attempt one compulsory question and 4 other questions, *i.e.*, selecting atleast one from each unit.

UNIT I

Introduction to pharmacogenomics and pharmagenetics, clinical trials in pharmagenomics, polymorphism of CYP450 enzymes affecting drug response, role of SNP in pharmacogenomics, The multi Drug Resistance proteins: drug carriers affecting drug response.

UNIT II

Basis of Drug Pharmacokinetics and Pharmacodynamics, molecular descriptors, QSAR methodologies 3D QSAR. Structure based drug designing, Ligand based drug designing, Different docking methodologies, success stories in docking.

UNIT III

Pharmacophore modeling, Pharmacophore generation- (Hiphop and HypoGen theories). Combinatorial libraries, High thoughtput screening, Virtual screening, Lipinski's rule of five and its applications. Chemoinformatics: Introduction, Chemical Database(ACD,MDDR and WDI), Application of Chemoinformatics in CADD.

Course Code No. 16CBTO2

NOTE: In all four questions will be set, two from each unit and one compulsory question of short answer type covering all the two units. Students are required to attempt one compulsory question and two other questions selecting at least one from each unit.

Theory

UNIT I

Gene Cloning and DNA Analysis in Agriculture: Methods in Molecular Cloning, Transformation of DNA: Chemical method and Electroporation; Gene delivery: Microinjection, eletroporation, biolistic method (gene gun), liposome and virus mediated gene delivery, *Agrobacterium* mediated gene delivery.

UNIT II

Development of transgenics for abiotic & biotic stress tolerance, Plants that make their own insecticides - The δ -endotoxins of *Bacillus thuringiensis*, Herbicide resistant crops (roundup ready crops), Gene subtraction: RNA silencing, CRISPER technology.

UNIT III

Genetically modified Crops: safety, risks and public concerns: GM foods-merits and demerits, Safety tests on commercial GM crops (GM maize, GM potatoes, GM rice, GM cotton, peas), Allergenicity studies, Public concerns-global scenario, Consumer's attitude towards GM foods, GM foods: issues with respect to India. Traceability of GMOs in the food production chain, Environmental and Safety concerns with selectable markers, The terminator technology, The possibility of harmful effects on the environment and humans.

Suggested readings:

1. Hou CT, Shaw JF (2009) Biocatalysis and agricultural biotechnology, CRC Press, USA
2. Brown, TA (2010) Gene Cloning and DNA Analysis: An Introduction, Sixth Edition. A John Wiley & Sons, Ltd., Publication, Germany.
3. Bhojwani SS, Soh WY (2005) Agro biotechnology and plant tissue culture, Oxford Press.
4. Clark DP, Pazdernik NJ (2009) Biotechnology: Applying the Genetic Revolution. Elsevier Academic Press, USA.
5. Primrose SB, Twyman RM (2006) Principles of Gene Manipulation and Genomics, 7th Edition. Blackwell Publishing, Oxford, U.K.
6. Kumar HD (2005) Agricultural biotechnology, Daya Publ House, India
7. Newbury HJ (2009) Plant molecular breeding, John Wiley and Sons., USA.
8. Kumar A, Shekhawat NS (2009) Plant tissue culture and molecular markers: their role in improving crop productivity (IK International)
9. Das HK (2010) Biotechnology, 4th Edition, Wiley India Pvt. Limited, India
10. Bawa AS and Kumar A (2013) Genetically modified foods: safety, risks and public concerns. J Food Sci Technol. 50(6): 1035–1046.

CourseCode No. 16CBTO4

NOTE: In all four questions will be set, two from each unit and one compulsory question of short answer type covering all the two units. Students are required to attempt one compulsory question and two other questions selecting at least one from each unit.

UNIT I

Production of proteins from cloned genes: Cloning vectors and expression vectors, primer designing, open reading frame (ORF) and DNA Restriction pattern analysis, *E. coli* expression vectors, criteria for choosing different vectors, importance of different *E. coli* strains for expression, optimization of expression of recombinant proteins in *E. coli*, Codon optimization.

UNIT II

General problems with the production of recombinant proteins in *E. coli*, Dealing with insoluble proteins, Recombinant protein production in Eukaryotic cells. Processing, purification and characterization of recombinant proteins. Applications of recombinant protein production.

UNIT III

Study of Genomes: Genome annotation, identifying the genes in a genome sequence, determining the function of an unknown gene. Study of gene expression and regulation: identification of gene transcript, identifying protein binding sites on a DNA molecule: methods to study DNA protein interactions. Identification of promotor and control sequences, Analysing and comparing transcriptome, *in vitro* transcription, studying and comparing proteome: 2DE, MudPIT, LC-MS. Protein-Protein interactions (PPIs).

Suggested readings:

6. Brown, TA (2010) Gene Cloning and DNA Analysis: An Introduction, Sixth Edition. A John Wiley & Sons, Ltd., Publication, Germany.
7. Clark DP, Pazdernik NJ (2009) Biotechnology: Applying the Genetic Revolution. Elsevier Academic Press, USA.
8. Primrose SB, Twyman RM (2006) Principles of Gene Manipulation and Genomics, 7th Edition. Blackwell Publishing, Oxford, U.K.
9. Wiley JM, Sherwood LM, Woolveron CJ (2008) Prescott, Harley and Klein's Microbiology. McGraw Hill Higher Education.
10. Primrose SB and Twyman RM (2008) Genomics: Applications in human biology. Blackwell Publishing, Oxford, U.K.

16BCHO2 :Human Health and Nutritional Disorders

Note: Question 1 will be compulsory and will cover the entire syllabus in the form of short questions. Question 2 to 7 will include two questions from each unit and candidate will have to attempt one question from each unit. Overall, four questions to be attempted. All questions to carry equal marks i.e. 20.

MM. Th 80+IA 20

Unit I

Food Physiology: Concept of balanced diet and energy content of foods; Basal and resting metabolism- influencing factors, Absorption of carbohydrates, lipids, proteins, nucleic acids, minerals and vitamins.

Common metabolic disorders: Diabetes mellitus, disorders of HDL-cholesterol, LDL-cholesterol, triglycerides, phenylketonuria, albinism.

Antioxidants: Free radicals: definition, formation in biological Systems. Natural anti-oxidants, defense against free radicals. Role of free radicals and antioxidants in health and disease.

Unit II

Vitamins: Dietary sources, biochemical functions and specific deficiency diseases associated with fat and water soluble vitamins; Hypervitaminosis symptoms of fat-soluble vitamins.

Minerals: Dietary sources and deficiency disorders of dietary calcium, phosphorus, magnesium, iron, iodine, zinc and copper.

Malnutrition and blood disorders: Etiology, clinical features, metabolic disorders and management of Marasmus and Kwashiorkor, Nutritional anemia - vitamin B₁₂, folate and iron deficiency anemia; hemoglobinopathies and thalassemias.

Unit III

Obesity: Definition, classification and biochemical basis; Genetic and environmental factors leading to obesity; Obesity related diseases and management of obesity.

Cardiovascular disease: Diseases of Liver, Gall bladder & Pancreas-Hepatitis, (A, B, and C), alcoholic liver disease, Gall stones, pancreatitis, Prevention and dietary management.

Clinical significance of aspartate aminotransferase, alanine aminotransferase, lactate dehydrogenase, amylase, lipase and trypsin. Diagnosis of jaundice and clinical importance of bilirubin.

Suggested Readings for 16BCHO2: Human Health and Nutritional Disorders:

1. Textbook of Medical Biochemistry **By** MN Chatterjea and Rana Shinde, Jaypee Brothers.
2. Review of Medical Physiology (Lange Basic Science) (Paperback) **By** William F. Ganong. Publisher: McGraw-Hill Medical
3. Clinical Biochemistry **By** Richard Luxton. Scion Publishing Ltd.
4. Principles of Medical Biochemistry: With STUDENT CONSULT Online Access (Paperback) **By** Gerhard Meisenberg and William H. Simmons. Publisher: Mosby.
5. Essentials of Food and Nutrition Vol I & II, **By** M. Swaminathan. Bangalore Printing and Publishing Co. Ltd.
6. Modern Nutrition in Health and Diseases, **By** Maurice E Shils and Vernon Robert Young, 7th Ed., Pub: Lea &Febiger.
7. Handbook of Nutrition and Food 2nd Ed., **By** Carolyn Berdanier, Johanna Dwyer and Elaine Feldman, CRC Press
8. Nutritional Biochemistry (Hardcover) **By** Tom Brody. Academic Press.
9. Nutritional Biochemistry (Paperback) **By** S Ramakrishnan and S. Venkat Rao. TR Publications
10. Nutritional Biochemistry and Metabolism: With Clinical Applications (Hardcover) **By** Maria C. Linder. Publisher: Appelton and Lange

**DEPARTMENT OF BOTANY
OPEN ELECTIVE**

**M. Sc. Botany
(Semester-III)**

Paper Code: 17BOTO2

Title of Paper: Plants: Source of Food and Health

Max. Marks:80

Internal Assessment: 20

Time: 3 hrs.

Note: The examiner is required to set even questions in all. Question No. 1 will be compulsory and short answer type covering the entire syllabus. The remaining six questions will be set with two questions from each unit. The candidate will be required to attempt four questions - Question 1 and three more questions selecting one from each unit.

Unit- I

Agriculture: origin, history, world centres of primary diversity of domesticated plants, shifting cultivation and consequential damage to forest ecosystem, benefits and adverse consequences of green revolution, emerging problems of agriculture sector of India and their possible solutions, concept of organic farming and sustainable agriculture

Unit- II

Horticulture: scope, classification and importance; Important commercial horticultural crops of India and Haryana, some underutilized fruits and vegetables of Haryana, Home gardening and their relevance in present time, Factors affecting horticulture in India, Issues in post harvest management of fruits and vegetables in India, National Horticultural mission

Unit- III

Medicinal Plant: Diversity and distribution, General account of local plants of medicinal importance, Drugs developed from traditional medicines, Bioprospection and biopiracy of medicinal plants, Indian initiatives for promoting the use of medicinal plants, Factors affecting medicinal plants diversity, conservation and management

(Open Elective Paper)
Fundamentals of Income Tax
Paper Code: 16COMO1

Maximum Marks: 100
Credits: 3:0:0
Time Allowed: 3 Hours

Theory Marks: 80
Internal Assessment Marks: 20

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of equal marks. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All questions shall carry equal marks.

Unit-I

Introduction: Meaning of tax, scope, objectives, importance, Important terms-assessee, person, previous year, assessment year, income, gross total income, total/taxable income, casual income, agriculture income, company, tax evasion, tax avoidance, tax planning, tax management.

Unit-II

Determination of residential status and incidence of tax with reference to residential status of an individual; exempted incomes of an individual

Unit-III

Income from various heads (basic introduction only), clubbing of incomes, set off and carry forward of losses, Computation of gross total income and taxable income.

Unit-IV

Computation of tax liability of an individual; filling and filing of Income Tax Returns (ITR-I & II only).

Note:

1. The objective of this paper is to make the students familiar with the mechanism of Income Tax Law
2. The examiner is not required to ask the students to calculate income from various heads of an individual. The examiner is also required to give computed incomes from different heads in the question paper.
3. The actual amount of allowed deductions with section must be given clearly in the question.

Suggested Readings:

1. *Direct Taxes law & Practice – Dr. H.C.Mehrotra & Dr. S.P. Goyal, Sahitya Bhawan Publications, Agra.*
2. *Direct Taxes & Practice – Dr. V.K. Singhania Taxmann Publication.*
3. *Direct Taxes law & Practice – Dr. Bhagwati Prasad – Wishwa Prakashan, N.Delhi.*
4. *Simplified Approach to income Tax: Dr. Girish ahuja & Dr. Ravi Gupta – Sahitya Bhawan Publishes & Distributors, Agra.*

SEMESTER-III
PAPER CODE-16DSS22OE2

STUDY OF WAR

Credits: 3:0:0

Time Allowed: 3 Hours

Maximum Marks: 100

Theory Marks: 80

Internal Assessment Marks: 20

INSTRUCTION FOR THE PAPER SETTERS

The Question Paper will consist of five units: I, II, III, IV and V. Unit-V will be compulsory. The first Four Units will consist two questions each from the respective unit and each question will carry 16 marks. Unit V of the question paper will consist Eight short answer type questions, without any internal choice and will cover the entire syllabus uniformly. Each short answer type question will carry Two marks. The Question Paper should be set strictly according to the syllabus. Separate marks for each question should be indicated in the question paper.

UNIT-I

1. Nature of War:-
 - a) Definition, Scope and Causes
 - b) Evolution of War: - Feudal, Dynastic, Peoples and Modern War
 - c) Cold War: - Definition, Concept, Historical Evolution

UNIT-II

2.
 - a) Principal of War
 - b) Feature of Modern Warfare
 - c) Future of War

UNIT-III

3. Strategy, Tactics and Logistics:-
 - a) Definition of Grand Strategy, Strategy and Tactics
 - b) Distinction between Grand Strategy, Strategy and Tactics.
 - c) Types of Strategy – Strategy of Indirect Approach, Strategy of Annihilation and Strategy of Exhaustion

UNIT-IV

4.
 - a) Origin and Causes of World War-I
 - b) Origin and Causes of World War-II
 - c) Indo-Pak War-1971: Origin and Causes

Recommended Books:-

1. Howard, Micheal, "Theory and Practice of War".
2. Howard, Micheal, "The Causes of War".
3. Bernard Black, L., "War its Causes".
4. Wright, Quincy, "A Study of War, University of Chicago Press, Chicago, USA. 1965.
5. Brodie, Bernard, "Strategy in the Missile age".
6. Pees David, "Korea the Limited War".
7. Carlvon Clasewitz (ed), "Principles of War", Army Publishers, Delhi-6, 1968.
8. Lt. Gen. K.K. Nanda, "Indo-Pak War-1971" (Hindi), Parbhat Publications, Asaf Ali Road, New Delhi.

Semester-III

16ECOO2- Principles of Economics (Open Elective Paper)

Max. Marks: 100
Time: 3 Hrs.

Written Exam:80
Internal Assessment: 20

Unit -1

Why study economics? The scope and method of economics; scarcity and choice; questions of what, how and for whom to produce and how to distribute output.

Unit-II

Indian Economy on the eve of Independence, British rule and its impact on Indian Economy, Emergence and development of Planning exercise in India – historical debates.

Unit-III

Trends and patterns in structure of population over time – growth rate, gender, rural-urban, literacy, regional; Structure and trends of Poverty and Inequality (interpersonal and regional); Inflation – trends, structure and causes; Unemployment – trends, structure and types.

Unit-IV

Trends in Agricultural Production and Productivity; Land Reforms – Genesis, Progress and current status; Green Revolution – Measures and its effects. Trends and Patterns of Industrial Sector; Changes in the structure of Indian Industry.

Note:

- (A) Nine questions would be set in all.
- (B) Question No. 1 based on the entire syllabus, would be compulsory. It would contain eight short answer questions of two marks each.
- (C) There would be two questions (16 marks each) from each of four units.
- (D) Candidates would be required to attend five questions (one compulsory and selecting one from each unit).)

Reading List:

- D.N. Divedi: Principles of Economics, 2nd Edition, Vikas Publication House.
- R Dutta and K P M Sundaram: Indian Economy, S Chand A.N.Agarwal: Indian Economy, Problems of Development and Planning, New Age.
- Mishra and Puri: Indian Economy, Himalaya.
- Planning Commission: Twelfth Five Year Plan, Vol I, II and III, Academic Foundation.
- Government of India: Economic Survey (latest issue)

.M.Ed. (2016-18)

16 EDU02
OPEN ELECTIVE - II (TRENDS AND CONCERNS OF TEACHER EDUCATION)

Time: 3 Hours
Credits: 3

Max. Marks: 100
(Theory: 80, Internal: 20)

NOTE FOR PAPER SETTER

Paper setter will set 9 questions in all, out of which student will be required to attempt 5 questions

Q. No. 1 will be compulsory and will carry 16 marks. It will comprise of 4 short answer type questions of 4 marks each to be selected from the entire syllabus.

Two long answer type questions will be set from each of four units, out of which the students will be required to attempt one question from each unit. Long answer questions will carry 16 marks each.

All questions carry equal marks

COURSE OBJECTIVES:

After completing the course, the students will be able to:

Develop an idea about the structure of secondary education in India.

Understand the recommendations of different education commissions regarding secondary & Senior Secondary education commissions.

Acquaint the students with the need, scope and purpose of educational management in terms of national needs.

make aware of the importance of making right choices in life, education, vocation etc.

develop and promote understanding of basic principles, areas, importance of guidance and counseling.

make students conversant with the practices of guidance and vocational choices.

understand the concept of teacher education along with its need and scope

understand the objectives of teacher education at elementary, secondary and higher education

develop understanding about the structure, curriculum and modes of pre- service teacher education and needs of innovation in pre-service teacher education programmes describe the need, concept and scope of teacher education and historical development with special emphasis on different documents.

develop in students an understanding of the concept and philosophy of inclusive education in different contexts

develop in students an understanding of the nature and types of diverse learners

enable students to analyze the trends and issues in inclusive education

COURSE CONTENTS

UNIT- I

Introduction to Secondary & Senior Secondary Education

Meaning, Aims & Objectives of Secondary & Senior Secondary Education

Secondary Education in India- Historical perspectives, pre & post Independence

Recommendations of various committees and commissions: Secondary Education Commission, Kothari Commission, Programme of Action 1992, NPE 1986, Ramamurti Review Committee, Janardhan Reddy Committee, Yashpal Committee, RMSA & NCF-2005

Educational Management

Meaning, Concept & need for Educational Management at Secondary to Senior Secondary School Level

Management at Nation: MHRD, CBE, NCERT

UNIT – II

Introduction to Guidance

Guidance Movement in India: Pre & Post Independence.

Concept, Principles & Functions of Guidance.

Types of Guidance: Educational, Vocational, Social & Personal Guidance.

Group Guidance: Meaning, Objectives, Characteristics, Advantages, Problems, Principles & Techniques.

Contemporary Models of Guidance; Mathewson Model, Sholen's Model, Chapman Model & Hoyt's Model.

Introduction to Counseling

Concept, Principles, Techniques & Procedure of Counselling.

Approaches of Counseling: Directive, Non-Directive, Eclectic Counselling.

Theories of Counseling: Freud's Psychoanalytic, Behaviouristic, Gestalt

Skills of Counseling: Building Trust, Listening, Observation & Empathy

Counselor: Characteristics, Functions & Ethics

UNIT-III

Teacher Education Introduction to Teacher Education

Concept, Need and Scope of Teacher Education.

Historical Development of Teacher Education

Aims and Objectives of Teacher Education at:

- i) Elementary Level.
- ii) Secondary Level.
- iii) Higher Level.

Pre- Service Teacher Education: Concept, Nature, Objectives and Scope.

In-service Teacher Education; concept, Need, Objectives and areas of Professional development.

Quality Assurance in Teacher Education

UNIT – IV

Inclusive Education for Children with Diverse needs

a) Introduction to Inclusive Education: Definition, concept and importance of Inclusive Education.

Concept of Access, Equity, Diversity, Human Rights & Social Justice.

Readiness of School, Principles and Models of Inclusion

b) Children with Diverse Needs

Definition and characteristics of children with sensory (hearing, visual and physically challenged) intellectual (gifted, talented and children mentally challenged children), developmental disabilities (autism, cerebral palsy, learning disabilities), social and emotional problems, scholastic backwardness, under-achievers, slow learners and other marginal groups.

Suggested Readings:

Aggarwal, J.C. (2008). Education in the Emerging Indian Society. Delhi: Shipra Publication.

Chauhan, S. (2012). Educational Management. New Delhi: Pearson Publication.

Sharma, R.A.(2009). Educational Administration & Management. Meerut:R Lal Book Depot.

Vashist, S.R. (2008). Educational Administration in India. New Delhi:Anmol Publication Pvt. Ltd.

Aggarwal, R. (2010). Elementary Guidance and Counselling , New Delhi: Shipra Publication.

Bala, Rajni.(2007). Guidance and Counselling: Modern Review, New Delhi: Afa Publication.

Chandra, R.(2009). Career information and Guidance and Counselling, Delhi:Isha Books.

Gibson, R. L. & Mitchell, M. (2008). Introduction Counselling and Guidance, New Delhi: PHI Learning Pvt. Ltd.

Kottler, J. A. & Shepard, D. S.(2008). Counselling Theories & Practices, Cenage Learning:1st Edition.

Rao, S N.(2006). Counselling and Guidance ,Delhi :McGraw hill Publication.

Rao, S. N.& Hari, H. S.(2004). Guidance and Counselling,New Delhi:Discovery Pub. House.

Saxena, A. (2006). Organization of Guidance Service ,Delhi: Rajat Publications.

Shrivastava, K.K. (2003). Principles of Guidance &Counselling , New Delhi : Kanishka Publishers. Singh, R. (2002). Educational & Vocational Guidance , New Delhi : Commonwealth Publishers

Yadav, R.H. (2012). Guidance & Counselling , New Delhi: APH Publishing Corporation
National Curriculum Framework for Teacher Education; Towards Preparing Professional and Humane Teachers, (2009) NCTE. New Delhi.

Mangla, S. (2000). Teacher Education: Trends and Strategies. New Delhi : Radha Publishing.
MHRD (1986). National Policy of Education and Program of Action. New Delhi, Govt. of India.

MHRD (1992). Program of Action. New Delhi, Department of Education, Govt. of India.

Govt. of India (1992). Report of C.A.B.E... New Delhi: Committee Department of Education.

Kohli, V.K. (1992). Teacher Education in India, Ambala: Vivek Publishers.

N.I.E.P.A. (1984). Report on Status of Teachers, New Delhi.

Sharma, R.A. (2005). Teacher Education, Meerut: Loyal Book Depot.

- Udyaveer (2006). Modern Teacher Training, New Delhi: Anmol Publications
- Ahuja. A; Jangira, N.K. (2002). Effective Teacher Training; Cooperative Learning Based Approach. New Delhi National Publishing house.
- Bartlett, L. D. and Weisentein, G. R. (2003). Successful Inclusion on for Educational Leaders . New Jersey: Prentice Hall.
- Daniels, H. (1999). Inclusive Education. London: Koegan.
- Gore, M. C. (2004). Successful Inclusion Strategies for Secondary and Middle School Teachers, Corwin Press: Sage Publications.
- Hegarty, S. & Alur, M. (2002). Education of Children with Special Needs : from Segregation to Inclusion, Corwin Press: Sage Publishers.
- Jha, M. M. (2002). School without Walls: Inclusive Education for All. Oxford: Heinemann Education.
- Karten, T. J. (2007). More Inclusion Strategies that Work . Corwin Press, Sage Publications.
- Panda, K. C. (1997). Education of Exceptional Children. New Delhi: Vikas Publications.
- Rayner, S. (2007). Managing Special and Inclusive Education , Sage Publications.
- Sharma P.L (2003). Planning Inclusive Education in Small Schools, R.I E. Mysore

Semester –III
Open Elective

16ENVO2: Disaster Management
MM. Th 80+IA 20

Time : 3 Hours.

Note: 1. Seven questions will be set in all.

2. Question No. 1 will be objective covering the entire syllabus & compulsory. The remaining six questions will be set with two questions from each unit. The candidate will be required to attempt five in total, Question I and four by selecting at least one from each unit.

UNIT- I

Disaster- Causes and phases of disaster, Rapid onset and slow onset disasters. Nature and responses to geo-hazards, trends in climatology, meteorology and hydrology. Seismic activities. Changes in Coastal zone, coastal erosion, beach protection. Coastal erosion due to natural and manmade structures.

UNIT- II

Floods and Cyclones: causes of flooding, Hazards associated with flooding, Flood forecasting. Flood management, Integrated Flood Management and Information System (IFMIS), Flood control. Water related hazards- Structure and nature of tropical cyclone, Tsunamis – causes and physical characteristics, mitigation of risks.

UNIT- III

Earthquakes: Causes and characteristics of ground-motion, earthquake scales, magnitude and intensity, earthquake hazards and risks, Volcanic land forms, eruptions, early warning from satellites, risk mitigation and training, Landslides.

Mitigation efforts: UN draft resolution on Strengthening of Coordination of Humanitarian Emergency Assistance, International Decade for Natural Disaster Reduction (IDNDR), Policy for disaster reduction, problems of financing and insurance.

Reference Books:

1. Bolt, B.A. Earthquakes , W. H. Freeman and Company, New York. 1988
2. Carter, N,W. Disaster Management: A Disaster Manager's Hand Book, Asian Development Bank, Manila. 1992
3. Gautam Ashutosh. Earthquake: A Natural Disaster, Ashok Publishing House, New Delhi. 1994
4. Sahni, P.and Malagola M. (Eds.).Disaster Risk Reduction in South Asia, Prentice-Hall of India, New Delhi. 2003.
5. Sharma, V.K. (Ed.). Disaster Management, IIPA, New Delhi. 1995.
6. Singh T. Disaster management Approaches and Strategies, Akansha Publishing House, New Delhi. 2006
7. Sinha, D. K. Towards Basics of Natural Disaster Reduction, Research Book Centre, New Delhi. 2006
8. Smith, K. Environmental Health, Assessing Risk and Reduction Disaster, 3rd Edition, Routledge, London. 2001 21

Food Fundamentals

There will be seven questions in all. The first question comprising of short answer type questions covering the entire syllabus will be compulsory. The remaining eight questions will comprise of a set of two questions from each unit and the candidate will be required to attempt question 1 and four more questions selecting at least one from each unit.

MM: Th 80+IA 20
Time: 3h

Unit I. Food nutrients and balanced diets

Characteristics of basic food groups and their contribution to the diet, Food functions, Nutrients: macronutrient (vitamins, carbohydrates, proteins), micronutrients (minerals), balanced diet: definition, factors affecting balanced diet

Unit II. Food processing and preservation

Objectives of cooking food and cooking methods: different cooking methods, effect of different methods of cooking on nutritive value of food. Food preservatives: chemical preservatives, salt, sugar, oil as food preservative. Food preservation by drying, dehydration, cooling/freezing and thermal processing including sterilization, blanching, pasteurization.

Unit III. Food packaging and labeling

Food packaging and its functions, food packaging & labeling, packaging types, understanding labelling rules & regulations, nutritional labeling: serving sizes, daily values, health claims etc., labelling requirements for pre-packaged foods

Recommended readings:

1. Potter, N.N and Hotchkiss, J.H. Food Science. CBS Publishers and distributors
2. Vieira, E.R. Elementary Food Science. Chapman and Hills publication
3. McWilliams, M. Food Fundamentals. Pearson India Education Services (Indian edition)
4. Training manual for food safety regulators, Volume I. Food safety and Standards Authority of India.

Open Elective Paper (offered by Department of Genetics)

Paper Code: 16GENO2

FORENSIC SCIENCE

Credits: 3

Internal Assessment Marks: 20

Time: 3hrs

Max. Marks: 80

Instructions

There will be a total of seven questions. Question No. 1 will be compulsory and shall contain ten short answer type questions without any internal choice and it shall cover the entire syllabus. The remaining six questions will include two questions from each unit. Students will be required to attempt one question from each unit.

Unit –I

Forensic Science: Definition of Forensic Science, Role of the Forensic Laboratory, History and Development of Forensic Science in India, Branches of Forensic Science. Administration and Organizational Setup: Brief introduction to DFSS, CFSL, GEQD, SFSL, RFSL, MFSL, FPB, NICFS, CDTS, NCRB and BPR&D. Educational qualifications and employment in Forensic Science Laboratory.

Unit –II

Forensic Evidences: Concise of Forensic Physical, Biological, Chemical and Psychological Sciences, types of cases and evidences involved. Laws and Principles of Forensic Science: Law of Exchange (Locard), Law of Individuality, Law of Comparison, Law of Progressive Changes and Law of Probability. Criminalistics: Definition, Securing & Searching methods, Documentation of crime scene. Methods of collection of forensic evidences, Role of Police at the Crime scene, scientific help at crime scene, handling of various types of crime scenes by police.

Unit –III

Basics of signature and handwriting comparison, fake currency note examination. Classification of Fingerprint patterns, cases involved methods of development and comparison of fingerprints. Forensic expert, Admissibility of Forensic testimony in Court of law, Frye and Daubert standards, Cross Examination, Ethics in Forensic Science. Accreditation of Forensic laboratories by NABL.

Suggested Books:

1. James, S.H and Nordby, J.J. (2003) Forensic Science: An introduction to scientific and investigative techniques CRC Press,
2. Saferstein : Criminalistics (1976) Prentice Hall Inc., USA.
3. Sharma, B.R. (1974) Forensic Science in Criminal Investigation and Trials, Central Law Agency, Allahabad, 1974.
4. J A Siegel, P.J Saukko (2000) Encyclopedia of Forensic Sciences Vol. I, II and III, Acad. Press

M.A. Geography Semester-III Session 2017-18 Onwards
17GEO01: INTRODUCTION TO GEOGRAPHY

Credit: 03 (2+1+0)

End Semester Exam:

80 marks

Internal Assessment: 20 marks

Total: 100 marks

Time: 3 hrs.

Learning Objectives:

The course on **Introduction to Geography** will discuss the basic concepts in geography. It is specifically designed to give an exposure of geographical concepts to students other than formal students of geography.

Learning Outcomes:

Student will be able to understand the geographical concepts which are relevant in day to day life.

Unit-I

Solar system , solar and lunar eclipse; Earth- shape, movements, formation of day/nights and seasons ; location-latitude-longitude, longitude and time zones.

Unit-II

Interior of earth; vulcanism and earthquakes; plate tectonics; weathering and erosion; brief introduction to major landforms.

Unit-III

Weather and climate: factors affecting and distribution; composition and structure of atmosphere; atmospheric pressure and global winds; introduction to Monsoon.

Unit-IV

Relief of oceans; oceanic salinity; circulation of oceanic water; currents of Atlantic, Pacific and Indian Oceans.

Note (i): Open Elective to be chosen from the basket of Open Electives (OEs) provided by the University.

(ii) The question paper will have five units. First four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

Leong, Goh Cheng.,2015, *Certificate Physical and Human Geography*, Oxford University Press, New Delhi.

Getis [Arthur and Bjelland Mark and Getis Victoria.](#), 2014,*Introduction to Geography*, McGraw Hill Education.

Singh, Savinder., 2006, *Physical Geography*, Pravalika Publications, Allahabad.

Strahler Alan and Strahler Aurther., 2005, *Introducing Physical Geography*, John Wiley & Sons, Inc.

M.A. Geography Semester-III Session 2017-18 onwards

17GEOO2: SOURCES OF GEOGRAPHICAL DATA

Credit: 03(2+1+0)

End Semester Exam: 80

marks

Internal Assessment: 20

marks

Total: 100 marks

Time: 3 hrs.

Learning Objectives:

The objective of the course is to apprise the students about the various sources of geographical data and its importance in the field of geography.

Learning Outcomes:

Students shall learn about the significance of geographical data, various sources related to physical and cultural environments, households, population, assets, facilities, building materials and policy interventions.

Unit - I

Nature and Main Sources of Geographical Data: Place Names, Census of India, Field Studies.

Unit - II

Place Names (Based on Physical and Cultural Environments).

Census of India: Primary Census Abstract: (Number of Households, Population, Sex, 0-6 Years Population, Scheduled Castes and Scheduled Tribes Population, Literate, Workers, Main Workers, Marginal Workers (Cultivators, Agricultural Labourers, HHI, Other Workers and Non -Workers and Non- Workers in respect of Total, Rural and Urban Population).

Unit-III

Census of India: Household Data: Condition of Household, Availing Banking Services, Availability of various Assets, Pre- dominant materials of Roof, Wall and Floor, Sources of Drinking Water and Location, Lighting, Availability of Latrine Facility, Types of fuel for Cooking.

Unit-IV

Census of India: Village Directory (Area. Population, Availability of Educational, Medical, Postal, Drinking Water, Communication Facilities, Land Use Pattern.

Note (i): Open Elective to be chosen from the basket of Open Electives (OEs) provided by the University.

(ii) The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

Census of India (2011): Instruction Manual for House Listing and Housing Census, Ministry of Home Affairs, Government of India, New Delhi.

Census of India (2011): Primary Census Abstract, India, CD, New Delhi.

Census of India (2011): Village Directory, District Census, CD, New Delhi.

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Paper: Survey of Sources of Indian History
Paper Code: 17HISO2

Max.Marks : 100

Theory : 80

I.A : 20

Note: Nine questions are to be set in all spreading into five units Each of the first four units shall contain two questions from each unit of the syllabus and Unit-V (Q. No. 9) which will be compulsory, shall contain eight short answer type questions (two marks each) covering the entire syllabus. The Candidates shall be asked to attempt five questions in all selecting one question from each unit including compulsory question. All questions shall carry equal marks.

Unit – I

Sources of Ancient India-I

a) Archaeological Sources

Stone Tools, Pottery, Coins & Inscriptions

b) Literary Sources

Vedic Literature, Epics (Ramayan & Mahabharat), Buddhist and Jain Sources

Unit-II

Sources of Ancient India-II

- a. Harsacharita, Rajtaringini
- b. Megasthenes, Al Beruni
- c. Arthashastra

Unit-III

Sources of Medieval India

- a. Ziauddin Barani: Fatwa-i-Jahandari
- c. Babur : Tuzak-i-Baburi
- d. Abul Fazal : Akbar Nama (3 Vols)

Unit-IV

Sources of Modern India

- a. Archival Records
- b. Private Papers: Officials and Non-Officials
- c. Newspapers and Periodicals

Suggested Readings:

Sankalia, H.D.	: Stone Age Tools, their Techniques and Uses (Pune, 1964)
Sircar, D.C.	: Indian Epigraphy, (Delhi, 1965)
Puri, B.N.	: India as Described by Early Greek Writers
Majumdar, R.C.	: Classical Accounts of India, (Calcutta, 1960)
Pargiter, F.E.	: Ancient Indian Historical Tradition, (London, 1922)
Winternitz, M.	: History of Indian Literature 3 Vols, (New Delhi-1963-67)
Law, B.C.	: India as Described in the Early Texts of Buddhism and Jainism
Birani, Ibn-i-Hasan	: Maqalat-i-Barani-Karachi, (N.D.)
Akbar S. Ahmed	: Discovering Islam: Making Sense of Muslim History and Society, (New Delhi, 1990.)
Elliot, Sir H.M. & J. Dowson	: History of India as Told by its Own Historians, 8 vols., London, (1867-77)
Rosenthal, F.	: History of Muslim Historiography, (Leiden, 1952)
Sarkar, Jagdish Narayan	: History of History Writings in Medieval India, (Calcutta, 1977)
Grewal, J.S.	: Muslim Rule in India, The Assessment of British Historians, (Calcutta, 1970)
"	: Medieval India: History and Historians, (Amritsar, 1975)
Ibn, Khaldun	: Muqaddiman: An Introduction to History, Eng. Tr. Ero Franz Rosenthal, (London, 1958)
S.P.Sen (Ed.)	: Historians and Historiography in Modern India, (Bombay, 1970)
Mukhia, Harban	: Historians and Historiography During the Reign of Akbar, (New Delhi, 1976)
Philips, C.H. (ed.)	: Historians of India, Pakistan and Ceylon, (London, 1961)
Publication Division, Ministry of I&B, Govt. of India	: Gazetteer of India Vol.II (History & Culture)

FUNDAMENTALS OF MARKETING

Course Code: 16IMSO2

MM: Th 80+IA 20

Time: 3 hours

Course Objective:

This course is designed to promote understanding of concepts, philosophies, processes and techniques of managing marketing operation and to develop a feel of the market place.

Unit -I

Nature and scope of marketing; corporate orientation towards marketplace; building and delivering customer value and satisfaction; retaining customers; marketing environment

Unit -II

Analyzing consumer markets and buyer behaviour; market segmentation, positioning and targeting; tools of product differentiation; marketing strategies in the different stage of the product life cycle

Unit -III

New product development process; product mix and product line decisions; branding decisions; pricing strategies; managing marketing channels; wholesaling and retailing

Unit -IV

Advertising and sales promotion; public relations; personal selling; evaluation and control of marketing effort; web marketing; green marketing

Suggested Readings:

1. Kotler Philip and Keller; Marketing Management; PHI, New Delhi
2. Kotler, Philip, Kevin Keller, A. Koshy and M. Jha, Marketing Management in South Asian Perspective, Pearson Education, New Delhi
3. Kerin, Hartley, Berkowitz and Rudelius, Marketing, TMH, New Delhi
4. Etzel, Michael J, Marketing: Concepts and Cases, TMH, New Delhi
1. Dhunna, Mukesh, Marketing Management – Text and Cases, Wisdom Publications, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section 'A'** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section 'B'** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

DEPT. OF JOURNALISM AND MASS COMMUNICATION

SEMESTER –III

Open Elective- Introduction to Mass Media

Time allowed: 3 Hours

Total Marks:100

Theory Marks: 80

Internal Assessment: 20

Note: The question paper will be divided into Five Units carrying equal marks i.e. 16 marks for each question. Each of the First Four Units will contain two questions and the students shall be asked to attempt one question from each unit. Unit Five shall contain eight short answer type questions without any internal choice and it shall be covering the entire syllabus. As such, all question in Unit five shall be compulsory.

Unit 1

- 1.1 Mass Media: Definition, Meaning & Concept
- 1.2 Types of Mass Media
- 1.3 Traditional & Folk Media- Characteristic Features
- 1.4 Print Media, Electronic Media, New Media- Characteristic Features

Unit 2

- 2.1 Print Media- Brief History, Evolution from early times
- 2.2 Print Media in India- Role in freedom struggle, growth of print media after independence
- 2.3 Important newspapers and magazines of India, noted journalists; current role and importance of print media
- 2.4 Emergence of Regional Print Media, Challenges before Print Media, Emerging trends of Print Media

Unit 3

- 3.1 Origin and Development of Radio in India; role and importance of radio as a medium
- 3.2 A.I.R, Private FM, Community Radio;, Current status of Radio in India
- 3.3 Origin and Development of Television in India
- 3.4 Public and Commercial Television; role and importance of Television as a medium; present status of Television industry in India

Unit 4

- 4.1 Brief History and Development of Cinema in India
- 4.2 Cinema as a medium of mass communication- role and importance; Emerging trends in Indian Cinema
- 4.3 New Media- salient features, social media, social sharing to social activism- new media as a medium of mass communication
- 4.4 Current status of New Media, especially Web Journalism; Emerging trends & challenges

Internal Assessment

Total Marks : 20

Note : The Break up of 20 marks for Internal Assessment (Theory Paper) is as under :

- | | |
|--------------------------|----------|
| 1. House Test | 10 Marks |
| 2. Class Attendance | 05 Marks |
| 3. Term Paper/Assignment | 05 Marks |

LL.M. SECOND SEMESTER EXAMINATION w.e.f. Session 2016-17

Open Elective (Constitutional Law)

PAPER CODE: 16LAWO2

MM: Th 80+IA 20

Time: 3 hours

NOTE FOR EXAMINER/PAPER SETTER

The question paper of each course will be divided into Five sections, each of the First Four Sections of the Question Paper will contain 2 questions respectively from Unit-1 to Unit-4 of the syllabus. The students will be required to attempt one question from each section. Section 5 of the question paper shall contain 8 short answer type questions of 3 marks each (without any choice) covering the entire syllabus. As such Section 5 will be compulsory. The examiner will be free to set the questions in problem forms based on case law.

NOTE FOR STUDENTS(ON QUESTION PAPER)

Attempt four questions from sections 1 to 4, selecting at least one question from each section. These questions shall carry 14 marks each. Section 5 is compulsory and each question in this section shall carry 3 marks.

UNIT-I

Preamble, Citizenship, Definition of State Under Art, 12. Rules of Interpretation under Art. 13

Leading Case: Mohammad Raza V State of Bombay AIR 1966 , SC 1436

UNIT-II

Right to Equality(Art.14), Special Provision for Weaker Sections of the Society, Reservation Polity, Fundamental Freedoms under Art.19, Freedom of Press.

Leading Case: Indira Sawhney v Union of India, AIR 1993, SC 477

UNIT-III

Protection in respect of conviction of offence (Art-20), Right to Life and Personal Liberty Article 21), Protection against Arrest and Detention (Art 22), Right against Exploitation (Art-23 & 24), Right to Religion (Art 25-28).

Leading Cases: Maneka Gandhi v Union of India, AIR 1978, SC 597

UNIT-IV

Cultural & Educational Rights of Minorities (Art.29 & 30), Right to Constitutional Remedies (Art, 32), Directive Principles of State Policy, Fundamental Duties.

Leading Case: T.M.A. Pai Foundation V State Karanataka AIR 2003 SC 355

BOOKS RECOMMENDED

Seervai, H.M.	: <u>Constitutional Law of India</u>
Hidayatullah, M.	: -do-
Tope, T.R.	: -do-
Shukla, V.N.	: -do-
Jain, M.P.	: <u>Constitutional Law</u>
Chander Pal	: <u>Centre State Relations and Indian Cooperative Federalism</u>
Chander Pal	: <u>State Autonomy in Indian Federation: Emerging Trends</u>
J.N.Pandey	: <u>Constitutional Law of India</u>

16LISO2: Information Sources and Literacy

MM: Th 80+IA 20

Time: 3Hrs.

Note

The paper is divided into 4 units. The candidates are required to attempt 5 questions in all selecting 1 question from each unit (out of two internal choices). Question 1 is compulsory consisting of 8 short answer type questions spread over the whole syllabus. All questions carry equal marks.

Objectives

- to provide knowledge regarding information sources;
- to impart practical knowledge to the students about the evaluation of reference and information sources; and
- to make students aware about information literacy and search strategies

Outcomes

Through this course the students will come to know about the various types of information sources in print and electronic form. The students will have knowledge of various types of databases and how to evaluate them. After completion of the course, the students will know the importance of information literacy and various search strategies.

Unit 1:Information Sources

Information sources and types : documentary and non-documentary

Print information sources: primary, secondary, tertiary

Electronic information sources: primary, secondary, tertiary

Books: concept, parts: front matter, body, back matter; types

Journals: concept, types, impact factor, h-index

Theses: concept, parts

Unit 2:Databases

Full text databases: Science Direct, Emerald

Abstracting and indexing databases: Medline

Citational databases: Scopus, Web of Science

Theses databases: NDLTD, Shodhganga

Open access resources: DOAJ, DOAB

Unit 3: Evaluation of Information Sources

Evaluation criteria

Evaluation of following information sources (print and electronic): dictionary: Oxford groups; encyclopedia: International Encyclopedia of Social Science, McGraw Hill Encyclopedia of Science & Technology ; biographical sources: International Who's Who; yearbook: World of Learning ;statistical sources: Census of India

Evaluation of internet resources

Unit 4:Information Literacy

Information literacy: meaning, definition
Information literacy and lifelong learning
Nature of information requirement
Literature search
Search strategies and techniques

Suggested Readings

- Eisenberg, Michael. *Information literacy: Essential skills for the information age*. 2nd ed. Westport Publ.: Libraries Unlimited, 2005.
- Gates, Jean Key. (1988). *Guide to the use of Libraries and Information Sources* (6thed). New York: McGraw-Hill.
- Katz, William A. (2002). *Introduction to Reference Work: Basic Information Services. Introduction to Reference Work: V1*. 8thed. New York: McGraw-Hill, 2002.
- Katz, William A. (2002). *Introduction to Reference Work: Reference Services and Reference Processes. V2*. 8thed. New York: McGraw-Hill.

***Open Electives to be offered
by
Department of Mathematics***

To be offered in 3rd Semester					
16MATO4	MATLAB	40	--	60	1:0:2
16MATO3	Statistical Tools using SPSS	50	--	50	2:0:1

16MATO3: Statistical Tools using SPSS

Time: 03 Hours

Max Marks : T50+P50
Credits : 2:0:1

Unit – I

Data: Qualitative and Quantitative Data, Cross-Sectional and Time series data, Univariate and Multivariate data. Scales of measurement of Data.

Frequencies, Bar charts, Pie Charts, Line Graphs, histograms, Measures of central tendency, dispersion, Skewness, Kurtosis, Box plots.

Unit – II

Concepts of Linear Correlation and Regression, Multiple Regression, Normality tests, t-tests, Chi Square tests, F-test, One way and Two way ANOVA.

Unit – III

SPSS Data File: Opening a data file in SPSS, SPSS Data Editor, Creating a data file, Editing and Manipulating data, Missing Values, Editing SPSS Output, Copying SPSS output, Printing from SPSS, Importing Data.

Charts and Graphs with SPSS: Frequencies, Bar charts, Pie Charts, Line Graphs, histograms,

Unit – IV

Descriptive Statistics with SPSS: Measures of central tendency, dispersion, Skewness, Kurtosis, Box plots.

Statistical tests using SPSS, Correlation and Regression using SPSS, Factor analysis using SPSS.

Note : The question paper will consist of **five** units. Each of the first four units will contain **two** questions from unit **I , II , III , IV** respectively and the students shall be asked to attempt **one** question from each unit. Unit five will contain **eight to ten** short answer type questions without any internal choice covering the entire syllabus and shall be **compulsory**.

Books Recommended:

1. Kothari, C.R., Research Methodology
2. Gupta, S.L. and Gupta, Hitesh, SPSS for Researchers, International Book House Pvt. Ltd.
3. Field, A., Discovering Statistics using SPSS, SAGE Publications.
4. Gupta, V., SPSS for Beginners, VJ Books Inc.
5. Rajathi, A. and Chandran, P., SPSS for you, MJP Publishers

Part-B (Practical)

Time: 03 Hours

Max Marks : 50

There will be a separate practical paper based on the above theory paper. All practicals are required to be done using SPSS.

16MATO4: MATLAB

Time: 03 Hours

Max Marks : T40+P60

Credits : 1:0:2

Section - I

Introduction to MATLAB Programming: Basics of MATLAB programming, Anatomy of a program, variables and assignments, data types, operators, working with complex numbers, mathematical operations, functions for input and output, good programming style.

Section - II

Introduction to vectors in Matlab: Defining a Vector, Accessing elements within a vector, Basic operations on vectors, strings, string functions, cell array, creating cell array, Introduction to Matrices in Matlab: Defining Matrices, Matrix functions, Matrix operations, vector functions

Section - III

Loops: for loops, while loops, Branching (conditional statements) - if statement, if else statement, else if statement, Executable files, subroutines, Built in functions and user-defined functions, function handles, function handles in m-files, inline functions.

Section - IV

Data files: Saving and recalling data, saving a session as text, C style read/write, Graphs and plots- Polar plot, plot3, mesh, contour, contourf, Using built-in algorithms: optimization and numerical integration (areas), Root-finding.

Note : The question paper will consist of **five** units. Each of the first four units will contain **two** questions from unit **I , II , III , IV** respectively and the students shall be asked to attempt **one** question from each unit. Unit five will contain **eight to ten** short answer type questions without any internal choice covering the entire syllabus and shall be **compulsory**.

Books Recommended:

1. MATLAB An Introduction With Applications 5ed, Author: Amos Gilat. Publisher: Wiley, ISBN13:. 978-1118629864.
2. Insight Through Computing: A Matlab Introduction to Computational Science and Engineering by C. F. Van Loan and K.-Y. D. Fan. SIAM Publication, 2009, ISBN: 978-0-898716-91-7.
3. MATLAB Programming, Y.Kirani Singh, B.B. Chaudhari, PHI Learning, 2007, ISBN 8120330811, 9788120330818.
4. An Introduction to Matlab, Krister Ahlersten, Bookboon.com, ISBN: 978-87-403-0283-7

M.Sc. Medical Biotechnology Semester -III
Course Title: Principles of Medical Biotechnology II

MM. Th 80 + IA 20

Course Code: 16MBTO2

Time: 3h

NOTE: The examiner is required to set seven questions in all. Question No. 1 will be compulsory and short answer type covering the entire syllabus. The remaining six questions will be set with two questions from each unit. The candidate will be required to attempt Question 1 and four more selecting at least one from each unit.

Theory

Unit – I

Cloning vectors- Plasmid, cosmid, phagemid, phasmid, bacteriophages YAC, BAC, HAC; Shuttle vectors; Recombinant – production, identification and selection; Restriction endonucleases, Ligases; Hybridization; Linkers and adaptors; DNA Transformation and transfection methods; Cell expression system; Human genome project

Unit – II

PCR and its variant; Blotting- Southern, northern & western; Genomic and cDNA library;; DNA Footprinting ; Gene therapy, Gene knockout, Tissue engineering.

Animal Cell Culture: Introduction and Application of animal cell culture. Equipments, materials, culture vessels for animal cell culture, Primary and established cell line cultures

Unit – III

Basic biology of stem cells; Types & sources of stem cells, Blood cell formation from Bone marrow stem cells, Isolation & characterizations of stem cells, Cancer stem cells, Induced pluripotent stem cells, Stem cell banking, Therapeutic application of stem cells.

Recommended Books

1. R. Lanza, J. Gearhart et al (Ed), Essential of Stem Cell Biology, Elsevier Academic press.

2. R. Lanza, I. Weissman, J. Thomson, and R. Pedersen, Handbook of Stem Cells, TwoVolume, Volume 1-2: Volume 1-Embryonic Stem Cells; Volume 2-Adult & Fetal Stem Cells, 2012, Academic Press.
3. Culture of Animal Cells- A manual of basic techniques by R.I. Freshney
4. Animal Cells Culture and Media, D.C.Darling and S.J.Morgan, 1994. BIOS Scientific Publishers Limited.
5. Gene cloning and DNA analysis - An Introduction (2006) 5th edition, T.A Brown, Blackwell publisher.
6. Essential genes (2006), Benzamin Lewin, Pearson education international.
7. Genome-3 (2007) T.A Brown. Garland science, Taylor & Francis, NewYork.
8. Principles of gene manipulation and Genomics (2006) 7th edition, S.B Primose and R.M Twyman, Blackwell publishing.
9. Principles of Genetic Engineering (2009), Mousumi Debnath, pointer publisher, Jaipur.
- 10.Molecular Biotechnology-Principles and Applications of Recombinant DNA (2003) 3rd edition, Bernard R Glick and Jack J pasternak. ASM press, Washington.
- 11.Human Molecular Genetics (2004) 3rd edition, Tom Strachan & Andrew P Read, Garland science.

(SEMESTER-III)

Open Elective: 16MCBO2 : Microbial Technology for Entrepreneurship

Time: 03 Hours

MM. Th 80+IA 20

Time: 2 h

Credits : 3:0:0

Note: The question paper will consist of 9 questions. Students will have to attempt 5 questions in total - Question no. 1 will comprise of short answer questions covering the entire syllabus and will be compulsory. Two questions to be set from each Unit and students will have to attempt one from each Unit.

Unit I

Commercial Microbial Products; Introduction to bioprocess development- upstream development, downstream process, Preservation and improvement of industrially important microorganisms, Strain development by mutagenesis, protoplast fusion and Genetic engineering.

Unit II

Raw materials and media formulation for microbial culture; batch, fed batch and continuous mode of bioprocess, Types of Bioreactors and their applications: Stirred tank bioreactor & Specialized bioreactors.

Unit III

Downstream process, Choice of bioprocess plant location; Methods of estimation of Capital Cost and Operational costs of bioprocess plant, Good Lab Practices (GLP) and Good Manufacturing Practices (GMP).

Unit IV

Introduction to Bioentrepreneurship; Factors necessary for Entrepreneurship; Attributes in an Entrepreneur; Market Assessments; Managing Technology transfer and Intellectual property in biotechnology in India, Licensing of Biotechnological invention, Funding agencies in India, Basics of Patents- Types of patents; Filing of a patent application.

Suggested readings:

1. Handbook of Bioentrepreneurship by **Patzelt**, Holger, **Brenner**, Thomas (Eds.) Publisher:
 2. SpringerBiotechnology. A Textbook of Industrial Microbiology, by W. Crueger and A. Crueger. Publisher: Sinauer Associates.
 3. Industrial microbiology by G. Reed, Publishers: CBS
 4. Bioprocess Engineering Principles by P. Doran. Publisher: Academic Press.
- Biochemical Engineering Fundamentals by J.E. Baily and D.F. Ollis. Publisher: McGraw Hill

M.Sc. Physics Semester III
Open Elective – II
Sources of Energy –II

PAPER CODE: 16PHYO2

Theory Marks: 80
Internal Assessment: 20
Time: 3 hours

Unit I

Bio-mass:

Introduction of biogas, Availability of bio-mass and its conversion theory, classification of biogas plants, principle & working of floating drum plant & fixed dome type plant- advantages & disadvantages. Biogas from plant waste, community biogas plants, utilization of biogas.

Unit II

Ocean Thermal Energy Availability, theory and working principle, performance and limitations.

Wave and Tidal Wave:

Principle, working, performance and limitations.

Unit III

Petroleum and Coal energy

Petroleum, origin, composition, production, extraction, octane number, kerosene, LPG, lubricants natural gas, physical properties and uses of coal, generis of coal, molecular structure, determination of fixed carbon content, coal for generation of electricity, zero emission power plants, coal reserves and mining.

Unit IV

Nuclear Energy

Nucleus and its constituents, charge mass, isotopes, isobars, mass defect, binding energy and nuclear stability, radiation and nuclear reactions.

Nuclear fission, chain reaction, U^{235} , U^{238} , controlled nuclear fission and nuclear reactors, fast breeder reactor, nuclear fusion, condition for nuclear fusion reaction, Hydrogen bomb, Nuclear bomb

Text / References Books:

1. John Twideu and Tony Weir, "Renewal Energy Resources" BSP Publications, 2006
2. M.V.R. Koteswara Rao, "Energy Resources: Conventional & Non-Conventional" BSP Publications, 2006.
3. D.S. Chauhan, "Non-Conventional Energy Resources" New Age International.
4. C.S. Solanki, "Renewal Energy Technologies: A Practical Guide for Beginners" PHI Learning.
5. Peter Auer, "Advances in energy system and Technology" Vol I & II Edited by Academic Press.
6. Raja A.K., "Introduction to Non-Conventional Energy Resources" Scitech Publications.
7. G.D. Rai, "Non-conventional Energy sources" Khanna Publishers

Semester-III **Open Elective**

Paper code 17PUBO2
Environment Protection Administration
w.e.f. 2017-18

Total Credit: 4+0+0 =4

L+T+P

Total Marks = 100

Semester End Exam = 80

Internal Assessment = 20

Note:

The question paper will consist of 5 units containing 9 questions. The students are required to attempt one question from each unit. Question no 9 consisting of eight short answer questions covering entire syllabus, is compulsory.

Unit-I

Environment: Meaning, definition, scope and significance

Environment Ethics

Environment Challenges in India

Unit-II

Environment Protection: Meaning, Definition and Significance.

Environment Protection Act, 1986

Bio-Diversity and its Conservation

Bio-Diversity Conservation Act, 2002

Unit-III

Environment Pollution, Meaning, causes, effects and control mechanism

Types of pollution, Environment Education, Air Pollution (Prevention and Control) Act, 1981

Water Pollution (Prevention and Control) Act, 1974

Unit-IV

Environmental Issues:

People's Participation in Environment Protection

Role of NGO and Panchayats in Environment Protection

Environment Management

Suggested Readings:

1. Murthy,D.B.N. Environmental Awareness & Protection : A Base Book on EVS, New Delhi: Deep & Deep, 2004
2. Radha , S. & A.S. Sankhyan, Environment Challenges of the 21st Century, New Delhi : Deep & Deep, 2004.
3. Tiwari, A.K., Environmental Planning and Management, New Delhi : Deep &

- Deep, 2006.
4. Murthy,D.B.N., Environmental Planning and Management, New Delhi : Deep & Deep, 2005
 5. Garg, Bansal and Tiwari, Enviornment Pollution & Protection, New Delhi, Deep & Deep, 2006
 6. Verma S.B. and S.K. Singh, Environment Protection and Development, New Delhi : Deep & Deep 2005
 7. Singh, P.P. & S. Sharma, Teaching of Environemtn, New Delhi: Deep & Deep, 2004
 8. Tiwari, K.L. and S.K. Jadhav, Paryavaran Vigian, New Delhi: I.K. International, 2009.
 9. Chatterjee, Benimadhab , Environmental Laws: Implementation Problems and Perspectives, New Delhi, Deep & Deep, 2002.
 10. Venkat, Aruna , Environmental Law and Policy, New Delhi, PHI Learning, 2011.
 11. Upadhayay, Jai Jai Ram , Pryavaran Vidhi, Allahabad, Central Law Agency, 2013.
 12. Sengar, Dharmendra S., Environmental Law, New Delhi, PHI, 2012.
 13. Tiwari K.L and S.K. Jadhav, Paryavaran Vigian, New Delhi, I.K. Internation, 2009.
 14. Ganesamurthy, V.S., Enviornmental Status and Policy in India, New Delhi: New Century Publications, 2011.

Department of Political Science

Semester- III 2017-18

Open Elective: *Natural and Manmade Disaster* 17POL01

Max. Marks: 80
Internal Assessment: 20

Note: The question paper will be divided into five units carrying equal marks i.e. 16 marks. Students shall be asked to attempt one out of two questions from each unit. Unit five shall contain eight short answer type questions without any internal choice and it shall be covering the entire syllabus. As such, all questions in unit five shall be compulsory.

UNIT- I

- i. Classification of Disasters; Conceptualizing the interface between environmental degradation and disasters
- ii. Natural Disasters I: Earthquakes & Tsunamis; Volcanic Eruptions; Landslides and Avalanches

UNIT- II

- iii. Natural Disasters II: Cyclones; Forest-fires; Droughts and Desertification; Floods

UNIT- III

- iv. Human Induced Disasters I: Nuclear Disasters; Chemical Disasters; Soil and Water Pollution

UNIT- IV

- v. Human Induced Disasters II: Global warming; Biological Disasters: Epidemics

Essential Readings

1. Ahmed, Shaik Iftikhar (2008). *Disaster Management in the Wake of a Flood*, Twenty First Century Publications, Patiala.
2. Bryant Edwards (2005). *Natural Hazards*, Cambridge University Press, U.K.
3. Carter, W. Nick (1991). *Disaster Management*, Asian Development Bank, Manila.
4. Central Water Commission (1987). *Flood Atlas of India*, CWC, New Delhi.
5. Central Water Commission (1989). *Manual of Flood Forecasting*, New Delhi.
6. Government of India (1997). *Vulnerability Atlas of India*, New Delhi.
- Kapur, A. (2010). *Vulnerable India: A Geographical Study of Disasters*, Sage Publications, New Delhi.
7. Kapur, A. (2005). *Disasters in India: Studies of Grim Reality*, Rawat Publications, Jaipur.
8. Sahni, Pardeep et al. (eds.) (2002). *Disaster Mitigation Experiences and Reflections*, Prentice Hall of India, New Delhi.

Further Readings:

1. Bilham, R. (2009). The seismic future of cities. *Bulletin of Earthquake Engineering*, 7, pp. 839-887.

2. Bureau of Indian Standards (2002). Indian Standards: Criteria for Earthquake Resistant Design of Structures, Part I, Fifth Revision.
3. Government of India (1997). Vulnerability Atlas of India (New Delhi: Building Materials and Technology Promotion Council, Ministry of Housing & Urban Poverty Alleviation).

MA 3rd Semester (Open Elective Paper)

Sem	Paper No	Code	Nomenclature of Paper	Contact hours/L +T+P	Marks			Credit
					Theory	I.A	Total	
III	Paper	16SOCO2	Indian Society	4:0:0	80	20	100	3

Scheme of Examination:

It is decided to adopt the new scheme of Choice Based Credit System of examination whereby all the papers have four units comprising of 80 marks and the Internal Assessment component will be of 20 marks in all the Semesters. In the theory paper students will be asked to attempt four questions from the four units selecting at least one question from each unit and the 5th question shall be compulsory which will cover all units in the format of short answer type questions comprising of about 50 to 60 words. Thus, the total marks for all the five questions i.e. four from the units (16x4=64) and the 5th compulsory question of short answer numbering eight of 2 marks each i.e (8x2=16) thus making the total weight age to 80 marks. The detail of Internal Assessment of 20 marks has been prescribed by the University is given below:-

(a) One Class Test	:	10 Marks
(b) One Assignment	:	5 Marks
(c) Attendance	:	5 Marks
Less than 65%	:	0 Marks
Up to 70%	:	2 Marks
Up to 75%	:	3 Marks
Up to 80%	:	4 Marks
Above 80%	:	5 Marks

M.A.(Sociology)
Semester-III
Open Elective Paper- 16SOCO2
Indian Society

Maximum Marks: 100
Theory: 80
Internal Assessment: 20
Time : 3 Hours

Note:

3. Nine question would be set in all.
4. Question No. fifth shall be based on the entire syllabus and would be compulsory. It would contain eight short answer questions of two marks each.
5. There would be two questions (16 marks each) from each of the four units.
6. The candidate would be required to attempt four questions (one compulsory and other four questions selecting one from each unit).

Unit – I

Indian Society: Evolution of Indian Society: Socio- Cultural Dimensions; Unity in Diversity: Cultural, Linguistic, Religious and Tribal.

Unit – II

Social Stratification: Social Differentiation and Stratification. Forms of Stratification: Caste, Class and Gender.

Unit – III

Social Change: Development and Social Change, Processes of Change: Sanskritization, Westernization and globalization.

Unit – IV

Contemporary Issues: Status of Women: Demographic, Social, Cultural, Economic and Political Dimensions; Adverse Sex Ratio: Causes and Consequences.

References:

- Ahlawat, S.R and Neerja Ahlawat (2015) (ed.) Crises of Social Transformation in India, Rawat Publication, Delhi
- Ahlawat, Neerja (2012) “Political Economy of Haryana’s Khaps”, “Economic and Political Weekly, Vol - XLVII No. 47-48, December 01.
- Ahlawat, Neerja (2013), “Dispensable Daughters and Indispensable Sons: Discrete family Choice”, Social Change, 43(3) PP-365-376
- Ahuja, Ram (2003) Society in India, Rawat Publications, Delhi
- Desai, Neera and Maithreyi Krishna Raj. (1987). Women and Society in India, New Delhi: Ajanta Publishers.

Dube, S.C. (1967). The Indian Village. New Delhi: National Book Trust.
Ghurye, G.S. (1957). Caste and Race in India, Bombay: Popular Book Depot.
Karve, Irawati (1961). Hindu Society: An Interpretation, Poona: Deccan College.
Prabhu, P.H (1979): Hindu Social Organization, Popular Prakashan.
Sharma, K.L. (2011). Indian Social Structure and Change, New Delhi: Rawat Publications. Srinivas,
M.N. (1960). India's Villages. Bombay: Asia Publishing House.
Srinivas, M.N. (1970). Social Change in Modern India, Berkeley, California: University of California Press.
(1991), India: Social Structure, Delhi: Chaman offset Printers.

Optimization Techniques (3rd Semester)

PAPER CODE: 16STAO3

Maximum Marks: 80
Internal Assessment Marks: 20
Time: 3 Hours
Credit: 03

Section –I

Linear Programming Problems: Formulation and their Solution by Simplex and Artificial Variable Techniques. Resolution of Degeneracy in LPP. Duality in LPP: Solution of Primal-Dual Problems by Dual Simplex Method and Economic Interpretation of Duality. Solutions of Integer Programming Problems (IPP).

Section –II

Transportation Problems: Mathematical Formulation and their Optimal Solution. Assignment Problems: Mathematical Formulation and their Solution by Hungarian Assignment Method.

Theory of Games: Characteristic of Games, Minimax (Maximin) Criterion and Optimal Strategy. Solution of Games with (or without) Saddle Point. Solution of $m \times n$ Games by Linear Programming Method. Principle of Dominance.

Section-III

Markov Chains: Classification of States and Chains. Higher Transition Probabilities. Elementary Idea of Birth and Death Processes. Queuing Theory: Description of Queuing Problems, Notations, Measures of Effectiveness and Characteristics. Queuing Systems: M/M/1, M/M/C, M/M/1/R, M/G/1 and G/M/1 Models with Waiting Time Distribution and their Steady State Solutions.

Section –IV

Inventory Problems: Classification and Cost involved in Inventory Problems. Solution of Deterministic and Probabilistic Inventory Models. Job Sequencing Problems: Processing of N Jobs through Two, Three and M Machines. PERT and CPM Techniques. Labeling Time Estimate and Determination of Critical Path on Network Analysis.

Books Suggested:

- | | |
|-------------------------------------|--|
| 1. Gass, S.I. | : Linear Programming (Methods and Applications) |
| 2. Kambo, N.S | : Mathematical Programming Techniques |
| 3. Hadely, G. | : Linear Programming |
| 4. Medhi, J. | : Stochastic Processes (New Age International) |
| 5. Donal, Gross & Carl, M. Hariss | : Fundamentals of Queuing Theory (Wiley) |
| 6. Kashyap, B.R.K & Chaudhary, M.L. | : An Introduction to Queuing Theory (A.A.Publications) |
| 7. Churchman | : Introduction to Operations Research (J. Wiley) |
| 8. Sharma, S.D. | : Operation Research (Kedar Nath Ram Nath, India) |

Note: The examiner is to set the question paper into five units- A, B, C, D & E. In each unit A, B, C & D, he/she has to set two questions of 16 marks each from section I, II, III, & IV respectively and the candidate will attempt one question from each unit. In unit E, there will be 8 short answered questions of 2 marks each, covering the whole syllabus and the candidate has to attempt all the questions.

DEPARTMENT OF ZOOLOGY
M. Sc. ZOOLOGY

Course Title: Wild Life And Conservation

Semester- III

Course no.: 16ZOOO2

MM:T80+IA20

Time: 3 Hr

Note: There shall be seven questions in total. One question will be compulsory (short answer type) covering the entire syllabus and remaining six questions will be set two from each unit. Students are required to attempt question 1 and 4 more selecting at least one from each unit.

Unit-I

Wildlife: Definition, significance and wildlife zones of the world and India, Protected Area Systems, Present status of National PA-Systems. Theory and Practice of Biosphere Reserves of the world: Biosphere Reserves of India. Natural Heritage sites, Wildlife and livelihood; Wildlife and illegal trade & control.

Unit-II

Wildlife Damage, electric fences for wildlife damage control, Basic electric fence design, Trench design, line trapping, Mist netting, Rocket netting Chemical capture: Equipment, Drugs, Plan of operation. Poaching: Its implications, conducting anti-poaching operations.

Unit-III

Wildlife conservation techniques, role of WWF, IUCN, UNEP, Red Data Book; Categories of Endangered Wildlife Species. National Projects: Project Tiger, Project elephant, Project Rhinoceros, Project Crocodiles.

***As per SOE Zoology**

****proposed maximum marks and subject to change in uniformity with other faculties of university**

List of Recommended Books

1. Techniques for wildlife Census in India by W.A. Rogers (A field manual); Wildlife Institute of India, Dehradun.
2. Wildlife Wealth of India by T.C. Majumuria; Tecpress Services, L.P., 487/42-SOL Wattenslip, Pratunam Bangkok, 10400, Thailand
3. Ali, S. Ripley S.D. Handbook of Birds of India, Pakistan 10-Vols. Oxford University Press, Bombay.
4. The Book of Indian Animals by S.H. Prater, BNHS-Publication, Bombay.
5. Wildlife in India by V.B. Saharia Natraj Publishers, Dehradun.
6. E.P. Gee, The Wildlife of India.