

ADIKAVI NANNAYA UNIVERSITY

RAJAMAHENDRAVARAM



M.Sc. Clinical Nutrition

Course Structure and Syllabus

2016-17 Onwards

ADIKAVI NANNAYA UNIVERSITY



M.Sc. DEGREE EXAMINATION IN CLINICAL NUTRITION - SYLLABUS (Effective from 2016-2017 Batch)

Synoptic note

- 1) BOS meeting for all PG Courses with effect from 2016-17 admitted batches
- 2) Syllabi last revised in 2012-13
- 3) There are about 25 different courses
- 4) The syllabus is proposed to be revised in accordance to the emerging concepts, industry and market needs.

Proposed Guidelines:

- 5) All Arts and Commerce PG courses have 5 subjects in each of the four semesters, with 100 marks for each paper and a total of 2000 marks.
- 6) All Science PG courses have 4 subjects in each of the four semesters with theory and practical in each of 100 and 50 marks respectively for each of the four semesters, all of which makes a total of 2400 marks. An additional 100 marks are allotted for project dissertation and presentation in all PG courses [except MBA/MCA/MA (SW) and M.Tech]. Thus the grand total for the science PG courses is 2500 marks.
- 7) For M. Sc Clinical Nutrition Students will go for internship for a period of six months(8 Hours/ Day) as they have to undergo training under a registered Dietitian and six months internship is mandatory to write Registered Dietitian Exam. Students will present their internship report as project work and present the same for viva voice.
- 8) Out of 100 marks for each subject, 75 marks (75%) in each paper are assigned for Semester End Examinations and 25 marks (25%) for internal / continuous assessment for all PG courses.
- 9) Each subject will have four units of syllabi in all PG courses (except MBA, which will have five units of syllabus for each subject).
- 10) Each subject will have 4 - 5 periods of class per week with 5 credits.

11) Semester end examination question paper has two sections, viz. section A with four essay questions, with internal choice a) or b) - one question from each unit of syllabus; section B has eight short answer questions, two from each unit of syllabus, with choice to answer any five.

For MBA the question paper consist of 3 sections; viz. section 'A' has 8 short answer questions, with a choice to answer any five for 20 marks. Section 'B' consist of 5 long answer question with internal choice; one question from each unit of syllabus for 40 marks and section 'C' is case study with no choice for 15 marks.

12) For all PG courses including MBA, the brake up for 25 marks (25 %) of internal examination / continuous assessment is as follows;

- a) 15 marks for written examination; two written examinations are to be conducted and an average of both examinations is considered for awarding final score
- b) 5 marks for attendance
- c) 5 marks for assignment preparation and presentation

(The proportionate may be followed for 50 marks paper / practical)

13) There will be project work for all PG courses except MBA, MCA, M.Tech , M,Sc Clinical Nutrition and MA (Social work) for 100 marks (50 marks for dissertation and 50 marks for presentation and viva-voice. The project work is to be done during summer vacation i.e. after II semester and before III semester. The dissertation of the project work is to be submitted by the student to the respective department during 2nd year study. The presentation and viva-voce examination of the project work is to be conducted at IV semester end examination. The project presentation and vive-voce examination is to be conducted by external examiner. For affiliating colleges, University teachers will be the external examiner and for University Department, external examiner is to be invited from other university. MCA / MBA /M.Tech/ MA (SW) will continue the extant system. The external examiner TA / DA and remuneration will be borne by the respective College / Department strictly as per the approved norms to be notified from time to time.

14) There may be comprehensive Viva-Voce at the end of every semester being conducted by all subject teachers, together assigning suitable credit from internal marks to be taken. This is intending to prepare and boost the student interview facing skills and comprehension of subject. This is proposed for PG courses.

M.Sc. CLINICAL NUTRITION
Scheme of Examination

Code	Title of the paper	Total Marks	Credits
I SEMESTER			
CN101	Human Physiology	100	4
CN102	Human Nutrition	100	4
CN103	Research Methodology and Biostatistics	100	4
CN104	Nutraceuticals and Functional foods	100	4
	Lab Course		
CN105	Human Physiology Lab	50	2
CN106	Human Nutrition Lab	50	2
CN107	Research Methodology and Statistics Lab	50	2
CN108	Nutraceuticals and Functional foods Lab	50	2
II SEMESTER			
CN201	Management of Health& Fitness	100	4
CN202	Nutrition in Disaster management & Public Health	100	4
CN203	Dietary Management	100	4
CN204	Pathophysiology and metabolism in disease	100	4
	Lab Course		
CN205	Management of Health& Fitness Lab	50	2
CN206	Nutrition in Disaster management & Public Health Lab	50	2
CN207	Dietary Management Lab	50	2
CN208	Pathophysiology and metabolism in disease Lab	50	2
III SEMESTER			
CN301	Food Microbiology	100	4
CN302	Product Development	100	4
CN303	Diet and Disease	100	4
CN304	Food Service Management	100	4
	Lab Course		
CN305	Food Microbiology Lab	50	2
CN306	Product Development Lab	50	2
CN307	Diet and Disease Lab	50	2
CN308	Food Service Management Lab	50	2
IV SEMESTER			
CN401	Internship-6 months (8 hrs/day, 48 hrs/ week)	200	28
CN402	Dissertation	300	
	Seminar Viva	100 100	
	Total	2500	100

ADIKAVI NANNAYA UNIVERSITY: RAJAMAHENDRAVARAM

BOARD OF CLINICAL NUTRITION

Date: 08-07-2016

AGENDA:

1. Syllabus for theory papers
2. Syllabus for practicals
3. Number of teaching hours / Periods theory / Practical
4. Credits / Evaluation
5. Eligibility and Entrance Examinations
6. Scheme of Valuation
7. List of Examiners for papers setting and Model Question Papers
8. List of Practical Examiners

Members present:

Dr. A. Matta Reddy

Dr. K. Sarala

Dr. M. Padmaja

Dr. Sunila Rani

Dr. P.Vijaya Nirmala

Dr. D. Kalyani

Dr. K. Satish Kumar

Dr. I.J.N.Padmavathi

minutes of the meeting of the Board of Studies in Biotechnology, Biochemistry, microbiology and Clinical Nutrition held on 8-7-2016 at Department of Zoology, Atikari Nanyang University Rajahmundry

Members present :-

1. Dr. A. Matta Reddy

Ammy

2. Dr. K. Sarala

Sarala.K

3. Dr. M. Padmaja

M. Pad

4. Dr. Sunila Rani

Dr. Sunila Rani

5. Dr. K. Ramaneswari

RD

6. Dr. P. Vijaya Nirmala

P. Vijaya Nirmala
8/7/16

7. Dr. D. Kalyani

D. Kalyani
8/7/16

8. Dr. K. Sathish Kumar

K. Sathish Kumar

9. Dr. I. J. N. Padmavathi

I. J. N. Padmavathi

RESOLUTION:

The Board for Clinical Nutrition consisting of above members have met on 8th July 2016 in the Seminar hall, Adikavi Nannaya University, Rajamahendravaram and considered the enclosed agenda. After thorough deliberations and discussions the board resolved as follows:

1. The members formulated the syllabus for M.Sc Clinical Nutrition, 2 years course on par with other Universities in the Country to be implemented from 2016-17 academic year.
2. The syllabus for practical for the above courses formulated on par with UGC model curriculum.
3. There shall be 4 to 5 periods per week for each theory paper & 3 periods for each practical.
4. A B. Sc Graduate with any subject in biology is eligible to apply for admission into M. Sc Clinical Nutrition.
5. Fourth semester completely is allotted for internship in hospitals under a registered dietitian.

6. Marks and credits are allotted to theory & practical papers in each semester. There will be 100 marks for each theory and 50 marks for each practical and a total of 600 marks for each semester. So 1800 marks for the three semesters (600 x 3). 700 marks for fourth semester- Internship-200 marks, Dissertation-300 marks, Seminar-100 marks and Viva-100 marks. A grand total of 2500 marks for the 2 year M.Sc. Clinical Nutrition course.
- 7. Examination pattern will be as follows.**
 - a) 75% of marks for Semester end Examination while the remaining 25% of marks for continuous Internal assessment which includes 5 marks for attendance (5 marks 95 % above, 4 marks 85-94%, 3 marks 75 – 84%, 2 marks 65-74%, 1 mark 55-64%), 5 marks for Assignment and Presentation and 15 marks for Mid-Examination, with one essay (10 marks) & one short question (5 marks) with internal choice.
 - b) The Semester End Examination question paper comprises of two sections –Section A & Section B. Section A consists of 4 questions, one question from each unit of syllabus with internal choice ‘a’ or ‘b’. Section-B consists of 8 short questions two from each unit of the syllabus, with a choice to attempt only 5 out of 8 questions.
 - c) In practical, 75% of marks for semester end examination (38 Marks) and Internal Semester Examination 25% (12 Marks) for continuous assessment for Practical paper (9 + Record-3).
8. Dissertation should be submitted by the students, during 2nd year of study, Presentation and Viva-voce is to be conducted by External Examiner. For affiliating colleges, University teachers will be the external examiner and for University Department, external examiner is to be invited from other university. The External Examiner TA/DA & Remuneration will be borne by the respective College/Department as per the approved norms.
9. A comprehensive Viva-voce to be conducted for students at the end of every semester in the presence of all subject teachers with 20 marks in order to prepare & boost the students to face the interview in future. The marks are adjusted from the internal presentation marks (5 marks in each subject i.e. 4x5=20 marks).

ADIKAVI NANNAYA UNIVERSITY

M.Sc. CLINICAL NUTRITION

Examination pattern:

Theory: 75% is End Semester Examination

25% is Internal Assessment

Practical: 75% is End Semester Examination

25% is Internal Assessment – Continuous Assessment

ADIKAVI NANNAYA UNIVERSITY
M.Sc. CLINICAL NUTRITION
SEMESTER END EXAMINATION

Model question paper

Time: 3 hrs

Max. Marks: 75

Section-A

4x15=60

Answer all the questions. Each question carries 15 marks

Q1. Unit-1

a or b

Q2. Unit-2

a or b

Q3. Unit-3

a or b

Q4. Unit-4

a or b

Section-B

5x3=15

Q5. It contains 8 short note questions with at least two from each unit, carrying 3 marks.

5 questions are to be answered at least one from each unit.

ADIKAVI NANNAYA UNIVERSITY, RAJAMAHENDRAVARAM
M.Sc CLINICAL NUTRITION SYLLABUS
(2016-2017 onwards)

I SEMESTER
CN101 HUMAN PHYSIOLOGY

UNIT-1 Digestive system-

1.1 Structure and functions of G.I. Tract (Liver, Pancreas, gall bladder),

1.2 Digestion and Absorption of Proteins, Fats and carbohydrates.

Endocrine system -

2.1 Endocrine glands, hormonal activities, Syndromes resulting from hypo and hyperactivity of thyroid, parathyroid, adrenal, pituitary, pancreatic hormones.

UNIT-1I - Urinary system -

3.1 Structure and functions of the kidneys, GFR and its regulation,

3.2 Mechanism of urine formation,

3.3 Maintenance of acid base balance, Water and electrolyte balance.

Respiratory system –

4.1 Structure of respiratory system,

4.2 Mechanism of respiration, pulmonary ventilation,

4.3 Chloride shift, Control of respiration.

UNIT-III – Blood –

5.1 Composition of blood,

5.2 Functions of cellular components, their significance,

5.3 blood groups. Clotting of blood, Erythropoiesis.

Cardiovascular System:

6.1 Structure of heart – cardiac cycle, cardiac output,

6.2 Structure and functions of blood vessels,

6.3 Blood pressure and its control mechanism.

UNIT-IV- Nervous system

7.1 Structure and function of neuron,

7.2 Nerve impulses, synapses, role of neurotransmitters,

7.3 Organisation of CNS, structure and function of Brain, Spinal cord, Blood Brain Barrier.

Skeletal system –

8.1 Structure and functions of bone, Bone formation, factors affecting bone growth,

8.2 Types of bones and joints.

Muscular system –

9.1 Structure, types and function of muscle tissue, types of muscle fibres.

REFERENCES

1. Tortora SJ and Grabowski SR (2004) Principles of anatomy and Physiology. New York, John Wiley and Sons
2. Elements Of Human Anatomy Physiology & Health Education by Dr.Ramesh K.Goyal Associates Dr.Anitha,A.mehta Dr.Gaurang B.Shah, B.S.Shah Prakashan
3. Textbook of Medical Physiology – Guyton, 8th edition, HBJ International Edition, WB Sanders
4. Essentials of Medical Physiology – Anil Baran Singha Mahapatra, 2nd Edition, Current Books International.

CN 102 HUMAN NUTRITION

UNIT-I: Energy-

- 1.1 Energy content of foods, physiological fuel value,
- 1.2 TEE, Energy balance, Basal metabolic rate, total energy requirements,
- 1.3 BMR & RMR, Factors affecting BMR,
- 1.4 Body composition, methods of assessment, Changes in body weight and body composition with the changing energy balance,
- 1.5 Thermic effect of food.

UNIT-II: Carbohydrates-

- 2.1 Types, Functions, sources,
- 2.2 Dietary requirements and recommended allowances with respect to various stages of life and for different activity.

Proteins –

- 3.1 Types, Functions, sources,
- 3.2 Dietary requirements and the recommended allowance with respect to various stages of life and for different activities.

Lipids-

- 4.1 Functions, types and sources,
- 4.2 Dietary requirements and the recommended allowance with respect to various stages of life,
- 4.3 Essential fatty acids and its deficiency,
- 4.4 Prostaglandins, Cholesterol.

UNIT-III: Vitamins-

5.1 Fat soluble – A,D,E,K - Sources, functions, deficiency, toxicity, dietary requirements and the recommended allowances with respect to various stages of life and for different activities.

5.2 Water soluble Vitamins: Vitamin C and B vitamins. Sources, functions, deficiency, toxicity, dietary requirements and RDA for all age groups.

UNIT-IV : Minerals-

- 6.1 Major minerals like Ca, P, Mg, Na, K - Sources, functions, deficiency, toxicity, Bio availability, Dietary requirements and the recommended allowance with respect to various stages of life and for different activities.
- 6.2 Minor like Fe, I, F, Zn, Cu, Mn, Se, Cr - Sources, functions, deficiency, toxicity, Bio availability, Dietary requirements and the recommended allowance with respect to various stages of life and for different activities.
- 6.3 **Nutrient interactions-** vitamin and mineral, macro and micro nutrients.
- 6.4 **Interactions between drugs, nutrients-** Effect of drugs on Nutrient intake, absorption, Metabolism and requirements, Drugs affecting the intake of food and nutrients and their absorption.

REFERENCES

- 1) Shills ME, Olson JA, Shike N, Ross AC (1999): Modern Nutrition in Health and Disease. 9th Ed. Williams and Wilkins
- 2) Mahan LK & Ecott- Stump S (2000): Krause's Food, Nutrition and Diet therapy, 10th ed. WB Saunders Ltd.
- 3) Bamji M, Prahlad Rao N, Reddy V (2000). Text book of Human Nutrition. Oxford and IbH publishing Co. Pvt. Ltd.
- 4) Swaminathan M(1985) Essentials of Food and Nutrition. Vol I and II.
- 5) Gopalan C and Narasinga Rao B(1988) Dietary Allowances for Indians. NIN

CN103 RESEARCH METHODOLOGY AND BIO STATISTICS

Research Methodology

UNIT I: Introduction to Research:

- 1.1 The Meaning of Research, Significance and Objectives of research.
- 1.2 Criteria of good research, merits and demerits of scientific research.
- 1.3 Different types of research: Historical, Ex-post facto research, Laboratory experiments, Field experiments, Survey research, Case study research, Operational and participatory research. Current research areas in Foods and Nutrition.

UNIT II: Research process:

- 2.1 Selection and statement of research problem.
- 2.2 Types of hypothesis, principles and formulation of hypothesis. Testing of hypothesis, level of significance.
- 2.3 Meaning and Formulation of Research designs.
- 2.4 Research variables- types of variables, selection and measurement of variables.
- 2.5 Report Writing: –Oral and Written abstracts, thesis and papers for seminars.

UNIT III: Data Base:

- 1.1 Tools and Techniques of data collection, Methods of collecting data,
- 3.2. Principles of construction of evaluative instruments- questionnaire, interview, observation, inventories, checklists, scaling techniques, Criteria for good measurement,
- 3.3 Sampling designs - types of sampling, simple random sampling, stratified random sampling, two stage sampling and cluster sampling, benefits of sampling, evaluating sample- merits and demerits of each sampling.
- 3.4 Use of computers in research for review collection and data analysis. SPSS, Internet applications, computer applications in food & nutritional research.

Statistics

UNIT IV: Role of statistics in research.

- 4.1 Meaning and scope of statistics, Basic principles of biostatistics and research methodology, sample size calculation analysis of data, , types of studies randomization, clinical trials,
- 4.2 Descriptive statistics- classification, tabulation frequency distribution, diagrammatic and graphic representation, analysis, categorization, coding and sampling.
- 4.3 Measures of central tendency and dispersion (absolute and relative) Mean, Median, Mode, their relative advantages and disadvantages. Measures of dispersion - mean deviation, standard deviation, Quartile deviation, Probability- definition, concept of discrete probability distribution, normal distribution, use of normal probability tables.
- 4.4 Correlation, coefficient of correlation and its interpretation, rank correlation, regression equation and predictions. Chi-square test for independent attributes.
- 4.5 Experimental design- complete randomized design, randomized block design- t& F tests, ANOVA.

REFERENCES

- 1) Fisher A.R. Yates. I. "STASTISCAL TABLES" 6th edition Longman group ltd., England.1982.
- 2) C.R. Kothari. "Research Methodology – methods & techniques" 2nd edition, New Age International publishers, New Delhi, 1985.
- 3) Krugner RA. Focus groups- Practical guide for applied research. Sage Publications Pvt. Ltd.

CN 104 NUTRACEUTICALS AND FUNCTIONAL FOODS

UNIT-1: Health foods

- 1.1 Current Market scenario of the health foods-public demand, market potential. Nutraceuticals- Definition, need, importance, classification, types, sources, processing of nutraceutical products, role in health, therapeutic applications.
- 1.2 Functional Foods- Definition, need, importance, classification, types, sources, processing of nutraceutical products, role in health, therapeutic applications
- 1.3 Phytochemicals- Definition, need, importance, classification, types, sources, role in health, therapeutic applications
- 1.4 Anti oxidants present in foods, Their role in health and disease

UNIT-II: Pharma and Designer foods-

- 2.1 Definition, need, importance, sources, Designing a food - Designer eggs, Diabetic foods, Sodium free, lactose free, phenylalanine free, fibre rich foods, role in health and therapeutic applications

UNIT-III Dietary supplements-

- 3.1 Fortification of nutrients, technology involved, examples of fortified foods, health implications.
- 3.2 Protein rich foods- Sources, types, methods of protein extraction, oilseeds, legume cakes, leaf protein concentrates,
- 3.3 Nutritional implications and therapeutic applications

UNIT-IV Low fat foods

- 4.1 Synthetic lipids, structured lipids, fat replacers, cholesterol free foods- health implications. 4.2 Non nutritive sweeteners- Definition, need, importance, types, sources,
- 4.3 Development of sugar free products, role in health, therapeutic applications
- 4.4 Food Biotechnology- Definition, need, importance, food processing improvements through biotechnology, GM foods, labelling, current scenario, health implications

REFERENCES

1. Birch. G.G & Parker. K. J. Nutritive Sweeteners- 2 Applied Science Publishers, New Jersey, 1982
2. Creighton, T.E. Proteins 2 nd edition, W.H. Freeman & company, New York, 1993
3. Hettiarachchy, S.N. Ziegler. R.G. Protein functionality in food systems, Ift basic symposium series, Hong Kong, 1994
4. Hand book of Nutraceuticals and Functional Foods Robert E.C. Wildman 2007
5. Regulation Of Functional Foods & Nutraceuticals Clare M. Hasler -2008

**M.Sc. CLINICAL NUTRITION
I SEMESTER PRACTICALS**

CN 105 HUMAN PHYSIOLOGY LAB

1. Blood Grouping and Rh factor
2. Complete blood count
3. Estimation of Haemoglobin in blood
4. Estimation of PCV
5. Measurement of Blood Pressure
6. Measurement of Pulse rate and respiratory rate
7. Analysis of ECG
8. Interpretation of various biochemical parameters during disease conditions

CN 106 HUMAN NUTRITION LAB

1. Blood analysis for Lipid profile
2. Estimation of Blood glucose
3. Estimation of Blood urea
4. Estimation of Blood creatinine
5. Estimation of Blood uric acid
6. Estimation of Blood calcium
7. Estimation of Blood phosphorus
8. Estimation of Blood iron
9. Estimation of Blood total protein
10. Estimation of Blood AG ratio
11. Estimation of Blood Bilirubin

CN107 RESEARCH METHODOLOGY AND BIO STATISTICS LAB

1. Intensive practical experience in- diagrammatic representation, graphical representation.
2. Frequency distribution, measures of central tendency.
3. Measures of dispersion, coefficient of dispersion
4. Correlation and regression
5. Kurtosis and regression, skewness regression.
6. Normal probability, tests of significance, sampling significance
7. Development of research tools- Questionnaire, Interview schedules,
8. Development of research tools- observation schedule, check list, inventory
9. Development of research proposal
10. Writing research articles- abstract, thesis, journal article (review and research)

CN 108 NUTRACEUTICALS AND FUNCTIONAL FOODS LAB

1. Market research analysis of functional foods
2. Market survey of locally available foods
3. Selection and formulation of the product using nutraceuticals & functional foods.
4. Testing of the developed product.
5. Conducting sensory tests and preparation of score cards, Ranking, Rating.
6. Conducting sensory tests - Ranking, Rating.
7. Costing of the Product.
8. Shelf life studies on developed products

II SEMESTER

CN 201 MANAGEMENT OF HEALTH & FITNESS

UNIT I: Introduction to Fitness and Training Benefits of Exercise

- 1.1 Components of physical fitness
- 1.2 Holistic approach to management of health and fitness including diet and exercise (Aerobic and anaerobic).
- 1.3 Alternative systems for Health and fitness

UNIT II: Musculo-skeletal Systems

- 2.1 Anaerobic exercise effect on musculoskeletal system.
- 2.2 Endurance, strength/ Power, Speed, Coordination, agility, balance etc.
- 2.3 Cardio--respiratory System. Effect of aerobic exercise on heart rate, blood pressure and lung function.
- 2.4 Assessment of coronary risk profile- RISKO factor, Emergency procedures.

UNIT III: Water and Electrolyte Balance:

- 3.1 Regime of hydration and dehydration.
- 3.2 Symptoms and effect of dehydration.
- 3.3 Sports Drink. Nutrigenic aids and supplements.

UNIT IV: Formulating dietary guidelines for-

- 4.1 Fitness and health,
- 4.2 Obesity management and Critically analyzing different established weight reduction diet plans.
- 4.3 Management of diabetes mellitus and
- 4.4 Management of CVD

References:

1. Mahan, L.K. & Ecott-Stump, S. (2000): Krause's Food, Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
2. Whitney, E.N. & Rolfes, S.R. (1999): Understanding Nutrition, 8th Edition, West/Wadsworth, An International Thomson Publishing Co.
3. Ira Wolinsky (Ed) (1998): Nutrition in Exercise and Sports, 3rd Edition, CRC Press.
4. Parizkova, J. Nutrition, physical activity and health in early life, Ed. Wolinsky, I., CRC Press.
5. Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999): Modern Nutrition in Health & Disease, 9th Edition, Williams & Wilkins.
6. McArdle, W. Katch, F. and Katch, V. (1996) Exercise Physiology. Energy, Nutrition and Human Performance, 4th edition, Williams and Wilkins, Philadelphia.

CN 202 NUTRITION IN DISASTER MANAGEMENT AND PUBLIC HEALTH

Unit I: Natural / manmade disasters resulting in emergency situations.

- 1.1 Famine, drought, flood, earthquake, cyclone, war, civil and political emergencies.
- 1.2 Factors giving rise to emergency situation in these disasters.

Unit II: Nutritional problems in emergencies in vulnerable groups.

- 2.1 Causes of malnutrition in emergency situations.
- 2.2 Major deficiency diseases in emergencies.
- 2.3 Protein – energy malnutrition.
- 2.4 Specific deficiencies.
- 2.5 Control of communicable diseases in emergencies .
- 2.6 Role of immunisation and sanitation.

UNIT III: Concept of public nutrition-

- 3.1 Relationship between health and nutrition.
- 3.2 Role of public nutritionists in the health care delivery.
- 3.3 National Health Care Delivery System, Determinants of Health Status, Indicators of Health

UNIT IV: Food and Nutrition Security

- 4.1 Food production, Access, Distribution, Availability, Losses, Consumption,
- 4.2 Food Security, Socio-cultural aspects and Dietary Patterns: Their implications for Nutrition and Health.
- 4.3 Nutrition Intervention Schemes and programmes operating in India- ICDS, Mid day Meals, Control programmes - Vitamin A , Anaemia, Goiter.

References:

1. Owen, A.Y. and Frankle, R.T. (1986): Nutrition in the Community, The Art of Delivering Services, 2nd Edition Times Mirror/Mosby.
2. Park, K. (2000): Park's textbook of preventive and social medicine, 18th Edition, M/s. Banarasidas Bhanot, Jabalpur.
3. Gopalan, C. and Kaur, S. (Eds) (1993): Towards Better Nutrition, Problems and Policies, Nutrition Foundation of India.
4. Gopalan, C. (Ed) (1987): Combating Undernutrition – Basic Issues and Practical Approaches, Nutrition Foundation of India.
5. National Family Health Survey I & II (1993, 2000): International Institute for Population Studies, Mumbai.

CN 203 DIETARY MANAGEMENT

UNIT I : Nutritional Care Process

- 1.1 Nutritional screening/ assessment and identification of nutritional problem
- 1.2 Nutritional Intervention and Diet Modification based on interpretation of
- 1.3 Patient data- clinical, biochemical and other relevant data
- 1.4 Nutrition Education and Counseling
- 1.5 Food Exchange List

UNIT II: Nutrition for weight management:

- 2.1 **Obesity**- Types of obesity Assessment of obesity, Causes of obesity: neural, hormonal, and psychological,
- 2.2 Health risks. Dietary Modification, Physical activity and exercise, Pharmacological and Surgical treatment, Maintenance of Reduced weight
- 3.1 **Underweight/Excessive Leanness** - Causes and assessment, Health risks, Dietary Management. Anorexia Nervosa and Bulimia Nervosa
- 4.1 **Nutrition in Fever and Infectious Diseases**-Effect of fever and infection on Nutritional status, Nutritional management: typhoid, tuberculosis and malaria, AIDS.

UNIT III. Upper Gastrointestinal tract Diseases –

- 5.1 Nutritional care and diet therapy in Diseases of oesophagus; oesophagitis, Hiatus hernia.
- 5.2 Disorders of stomach: Indigestion, Gastritis, Gastric and duodenal ulcers, Gastric Surgery, dumping syndrome

Lower gastrointestinal tract Diseases/Disorders-

- 6.1 Common Symptoms of Intestinal dysfunction - Flatulence, constipation, haemorrhoids, diarrhoea, steatorrhoea,
- 6.2 Diseases of the large intestine: Diverticular disease, Irritable bowel syndrome, inflammatory bowel disease
- 6.3 Diseases of Small intestine: Celiac (Gluten –induced) sprue, tropical sprue, intestinal brush border enzyme deficiencies, Lactose intolerance, protein- losing enteropathy
- 6.4 Intestinal surgery: Short bowel syndrome, Ileostomy, Colostomy, Rectal surgery

UNIT IV : Diseases of the Hepato - Biliary Tract

- 7.1 Nutritional care in liver disease - Dietary care and management in viral hepatitis , cirrhosis of liver, hepatic encephalopathy, Wilson's disease
- 7.2 Dietary care and management in diseases of the gall bladder and pancreas i.e. biliary dyskinesia, cholelithiasis, cholecystitis, cholecystectomy, pancreatitis, Zollinger- Ellison syndrome

Delivery of Nutritional Support – Meeting nutritional needs

- 8.1 Enteral tube feeding, Different Enteral feeding access, Parenteral nutrition

References:

1. Mahan, L.K. and Escott-Stump, S. (2000): Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
2. Escott-Stump, S. (1998): Nutrition and Diagnosis Related Care, 4th Edition, Williams and Wilkins.
3. Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone.
4. Williams, S.R. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/Mosby College Publishing.

CN 204 PATHOPHYSIOLOGY AND METABOLISM IN DISEASE

UNIT I. Basic concepts of pathophysiology and metabolism of adaptation

- 1.1 Altered cellular and tissue biology,
- 1.2 Fluid and electrolyte, acids and bases, Immunity.
- 1.3 Inflammation, Hypersensitivity, infection and Immunodeficiency, Stress and Disease
- 1.4 **Cellular Proliferation and Cancer** - Biology of Cancer, Tumor spread and treatment, Clinical manifestations of cancer
- 1.5 **Alterations of Haematologic functions** - Anemias and clinical manifestations, Thalassemia, sickle cell anemia

UNIT II: Renal and Urological Biochemistry and Pathophysiology

- 2.1 Alteration of renal and urinary tract function, Urinary tract obstruction,
- 2.2 Kidney stones, Cystic pyelonephritis, glomerulonephritis, nephrotic syndrome, renal failure

UNIT III: Digestive system: Biochemistry and Pathophysiology

- 3.1 Manifestations of gastrointestinal dysfunction,
- 3.2 Acute and chronic gastritis, Ulcers
- 3.3 Malabsorption syndrome,
- 3.4 Pancreatic insufficiency and Pancreatitis ,
- 3.5 Liver dysfunction, Hepatitis, Cirrhosis,
- 3.6 Cholelithiasis, Ulcerative colitis, Crohn's disease

UNIT IV: Musculoskeletal system-Biochemistry and Pathophysiology

- 4.1 Metabolic changes occurring in disease conditions- Osteoporosis, Osteomalacia, Osteoarthritis, Rheumatoid Arthritis, Gout

References:

1. Mahan, L.K. and Escott-Stump, S. (2000): Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
2. Escott-Stump, S. (1998): Nutrition and Diagnosis Related Care, 4th Edition, Williams and Wilkins.
3. Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone.
4. Williams, S.R. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/Mosby College Publishing

**M.Sc. CLINICAL NUTRITION
II SEMESTER PRACTICALS**

CN 205 MANAGEMENT OF HEALTH & FITNESS LAB

1. Effect of Specific Nutrients on Work Performance and Physical Fitness and Training diets.
2. Market survey and consumption pattern of nutrigenic aids and supplements.
3. Exercise prescription in Obesity and weight control – Prevention of weight cycling.
4. Exercise prescription in Diabetes
5. Exercise prescription in Hypertension and Coronary Heart Disease
6. Exercise prescription in Osteo Arthritis and Osteoporosis
7. Exercise prescription in Spondylitis Back aches
8. Exercise regime for pre and post-natal fitness.

CN 206 NUTRITION IN DISASTER MANAGEMENT AND PUBLIC HEALTH

1. Comparison of rural, urban and tribal communities for determinants of malnutrition
2. Comparison of rural, urban and tribal communities for types of nutritional problems in different age groups.
3. Appraisal of existing interventions and programmes in the voluntary and government sector.
4. Development of a plan for a nutrition intervention project in the community.
5. Development of low cost nutritive recipes suitable for various vulnerable groups.
6. Visit to nutrition rehabilitation centre

CN 207 DIETARY MANAGEMENT LAB

1. Exchange list as a tool in planning diets
2. Nutrition for weight management in Obesity
3. Nutrition for weight management in Underweight/Excessive Leanness
4. Nutrition for weight management in typhoid
5. Nutrition for weight management in tuberculosis and malaria
6. Nutrition for weight management in AIDS.
7. Medical Nutrition therapy for Gastric and duodenal ulcers.
8. Medical Nutrition therapy for Gastric Surgery
9. Medical Nutrition therapy constipation and diarrhoea
10. Medical Nutrition therapy for Hepatitis

CN 208 PATHOPHYSIOLOGY AND METABOLISM IN DISEASE LAB

1. Nutritional screening and nutritional status assessment of the critically ill.
2. Nutritional support systems and other life – saving measures for the critically ill.
3. Special diets in critical care.
4. Complications of Nutritional Support System including refeeding syndrome and rehabilitation diets.
5. Enteral Nutrition : sites for Enteral nutrition, Ryles tube and its care, Types of feeds, advantages and disadvantage of home-based feeds, Commercial formula feeds.
6. Total Parental Nutrition: Site of TPN and its care, Composition

SEMESTER-III
CN 301 FOOD MICRO BIOLOGY

UNIT-I- Types of microorganisms and their general characteristics -

- 1.1 Fungi (molds and yeast), Bacteria and Virus.
- 1.2 Food poisoning and food infections- causative agents, symptoms , Sources of contamination
- 1.3 Spoilage of different kinds of foods and their products (cereals, pulses, fruits and vegetables, milk and milk products, egg, meat and meat products, fish).

UNIT-II- Sterilization and Disinfection:

- 2.1 Sterilization by Physical agents- Heat, moist heat, fractional sterilization, pasteurization, other types of sterilization,
- 2.2 Chemical sterilization.

UNIT-III- Toxicology:

- 3.1 Definition, Classification of food toxicants,
- 3.2 Factors effecting toxicity of foods and disease out breaks.
- 3.3 Food toxins and implications on human health: Neurotoxicity, Hepatic toxicity, Nephron toxicity, Haemotoxicity, skeletal toxicity, Reproductive toxicity, Allergenicity, Mutagenicity, Teratogenic effects, Carcinogenic and miscellaneous manifestations.

UNIT-IV- Non-organic and Organic metallic contaminants:

- 4.1 Food stuffs contamination of foods by containers and packaging material.
- 4.2 Manmade organic chemical food contaminants- pesticide residues, tolerance of action and toxic effects.
- 4.3 Endogenous toxicants in foods derived from plants: Cyanogenic glycosides, Vasoactive amines, Psychoactive compounds, Lathyragens, Flavones, Chalcones, Carcinogens, Phytoestrogens and Toxic fatty acids.

REFERENCES

1. Frazier WC and Westhof DC (1978) Food Microbiology. New Delhi. Tata Mc Graw Hill
2. James MJ (1996). Modern Food Microbiology. 4th edition, New Delhi CBS(pbs)
- 3 . Pelezar MJ, Reid RD and Chan (1977). Microbiology. New Delhi. Tata Mc Graw Hill
4. Stanier rY, Ingraham JL, Wheelis ML, Painter PR(1986) General Micro Biology. Mc Millan Education Ltd. London.
5. Hand Book of Food Toxicology by Deshpande, 2002.

CN 302 PRODUCT DEVELOPMENT

UNIT I: FOOD PRODUCT DEVELOPMENT

- 1.1 Definition ,Significance of product development,
- 1.2 New Technologies driving the food product development,
- 1.3 Steps involved in product development,
- 1.4 Food product standardization,
- 1.5 Intellectual property rights, Legislations covering IPR in India, IPR with special emphasis on GM foods.
- 1.6 Patenting of foods: Conditions to be satisfied by an invention to be patentable, Inventions which are not patentable in India, Filing a patent application, Documents to be submitted by a patentee, Criteria for naming inventors

UNIT II: EVALUATION OF FOOD QUALITY

- 2.1 Sensory characteristics of food: colour, texture, flavor, odour and taste,
- 2.2 Flavouring substances used in foods
- 2.3 Sensory evaluation of foods: Laboratory set up, equipment, Panel selection and training, judging quality
- 2.4 Subjective evaluation techniques: Difference tests: paired comparison test, duo-trio test, triangle test, Rating tests – Ranking single sample, Two sample and Multiple sample difference tests., analysis of sensory data. Objective tests to assess sensory properties of foods.

UNIT III: FOOD PACKAGING

- 3.1 Food packaging: Importance, Definition, Principles of packaging,
- 3.2 Types of packaging material: Metal, glass, Paper, plastic, edible packaging material, miscellaneous packaging materials,
- 3.3 Packages with special features: Boil-in-bag package, plastic-shrink package, Cryovac film, microwave oven packaging, high barrier plastic bottles
- 3.4 Aseptic packaging in composite cartons, military food packaging, ovenable paper boards, distribution packaging,
- 3.5 Packaging Laws and Regulations as per SWMA, PFA,

UNIT IV: PRODUCT LABELLING, PRICING AND MARKETING

- 4.1 Product labelling: purpose, types,
- 4.2 Product labelling regulations, Nutrition labelling,
- 4.3 Product pricing, Product marketing – role and strategies,
- 4.4 Grading of foods,
- 4.5 Emblems and names (prevention of improper use) Act, 1950,
- 4.6 Logistics for success of new product.

BOOKS RECOMMENDED

1. Orientation for Food Professionals, A Hand book – P V Suryaprakasa Rao.
2. Hand book of Analysis of Quality Control for Fruit and Vegetable Products – S. Ranganna, 2nd edition.
3. Sensory Evaluation Techniques – Mcilgard, Civille, Carr, 3rd edition.
4. Indian Patents Law - Legal and Business Implications, Eds Ajith Parulekar, Saritha D'Souza.
5. The law of Intellectual Property Rights – Ed Shiv Sahai Singh.

CN 303 DIET AND DISEASE

UNIT I: Nutrition for Diabetes Mellitus and hypoglycemia

- 1.1 Aetiology, classification, symptoms and diagnosis,
- 1.2 Home blood glucose monitoring, Glycosylated haemoglobin, Urine testing, Oral hypoglycemic agents.
- 1.3 Insulin, nutritional management- Diet planning for Type1, Type2, For Special conditions- Pregnancy, Elderly, Surgery.
- 1.4 Complications, treatment.

UNIT II: Nutrition in Hypertension

- 2.1 Hypertension – classification (secondary and essential),
- 2.2 Risk Factors for hypertension,
- 2.3 Dietary management-DASH approach, Use of various drugs .

UNIT III: Nutrition in Cardiovascular Diseases

- 3.1 Atherosclerosis - Etiology and understanding the pathogenesis,
- 3.2 Coronary Heart Disease, Angina Pectoris and Myocardial Infarction- Clinical manifestation and dietary management
- 3.3 Congestive Heart Failure-Pathogenesis of sodium and water retention, risk factors Clinical manifestation,
- 3.4 Cardiac Cachexia-Treatment, Nutritional Care.
- 3.5 Cerebrovascular Disease and Peripheral Vascular Disease-etiology and dietary care

UNIT IV: Nutrition in Renal Diseases

- 4.1 Classification of kidney diseases
- 4.2 Glomerulo Nephritis-Etiology, characteristics , Principles of dietary treatment and management.
- 4.3 Nephrotic Syndrome-Etiology, Principles of dietary treatment and management
- 4.4 Uremic Renal Failure- importance of protein nutrition in renal failure and uremia
- 4.5 Causes and Dietary management in Acute Renal Disease, Chronic Renal Disease, complications,
- 4.6 Sodium and Potassium Exchange list.
- 4.7 Dialysis – Haemodialysis, CAPD, Continuous Ambulatory peritoneal dialysis),
- 4.8 Renal Transplant and its nutritional care,
- 4.9 Nephrolithiasis- etiology, types of stones and nutritional care (acid & alkaline ash diet)

References:

1. Mahan, L.K. and Escott-Stump, S. (2000): Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
2. Escott-Stump, S. (1998): Nutrition and Diagnosis Related Care, 4th Edition, Williams and Wilkins.
3. Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone.
4. Williams, S.R. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/Mosby College Publishing.

CN 304 FOOD SERVICE MANAGEMENT

UNIT I- Introduction to Food Service industry –

- 1.1 Objectives, scope, Organisation chart of Dietary/Food Service Department,
- 1.2 Types of food service systems – Centralised and Decentralised.
- 1.3 Introduction to the complex nature of medical food service management,
- 1.4 roles and responsibilities of the health care team.

UNIT II- Planning and equipment purchase-

- 2.1 Layout Design: Space allowances, design development,
- 2.2 Space relationship, flow of traffic.
- 2.3 Equipment, Factors affecting selection of equipment; features of equipment. Care and maintenance .
- 2.4 Materials Management- Meaning, definition, importance,
- 2.5 Purchase and inventory management, Methods and process of purchase, documents used in purchase control,
- 2.6 Store Keeping: Principles, essentials and duties of store keeper, Storing and issuing control.

UNIT III :Costing-

- 3.1 Definition of cost, costing, Elements of cost – Material (Food) Cost – Labour – Overheads and calculation of percentages,
- 3.2 Concept of profit – gross profit, after-wage profit, net profit and calculation of percentages, Cost profit volume analysis,
- 3.3 Budget and budgetary control for food service institutions.

UNIT IV:- Service Management-

- 4.1 Table service, Dining room management,
- 4.2 Delivery and service of food in different institutions
- 4.3 Staff and personnel management- Manpower Planning, Recruitment, Selection, Induction, 4.4 Performance Appraisal-Motivation, Training&Development, Labour Laws,
- 4.5 Need, process of communication.

REFERENCES

1. Mohini Sethi & Surjeet Malhan (1987) Catering Management. An Integrated Approach. Wiley Eastern Ltd. New Delhi.
2. Awatramani P (1980). Catering management for Indian Hotels. Bombay. Popular Book depot.
3. Bessie B and West Le Wood (1986) Food Service in Institutions (6th Ed.) Macmillan Publishing Co.
4. Buttle F (1992) Hotel and Food Services marketing- a managerial approach. London ELBS/Casell
5. Lillicrap DR (1998) Food and Beverage service, 5th ed. London: ELBS/Hader and Stoughton

**M.Sc. CLINICAL NUTRITION
III SEMESTER PRACTICALS**

CN 305 FOOD MICROBIOLOGY LAB

1. Study of Compound Microscope. Principles used in working of microscope
2. Study of stains and staining reactions- Simple staining and differential staining, gram's staining, acid fast staining, negative staining, capsule and endospore staining.
3. Preparation of media, aseptic inoculation techniques
4. Study of the microbial contamination in the kitchens and serving areas
5. Micro biological analysis of water- test for coli forms-most probable no, differential test, IMVIC's test.
6. Bacteriological analysis of different foods- milk, curd, vegetables, fruits, cereals, sugar, salt, spices, soft drinks, pastries and canned foods .
7. Tests for food colours ,
8. Tests for heavy metals.
9. Tests for pesticides residues .

CN 306 PRODUCT DEVELOPMENT LAB

1. Measurement of colour
2. Measurement of viscosity, consistency, texture
3. Tests for identification of packaging material
4. Measurement of resistance of packaging
5. Difference tests: paired comparison test, duo-trio test, triangle test,
6. Ranking tests – Ranking single sample, Two and Multiple sample difference tests.
7. Rating tests – Hedonic scaling, Numerical scoring, Composite scoring.
8. Sensitivity tests

CN 307 DIET AND DISEASE LAB

1. Nutrition for weight management in Diabetes Type I
2. Nutrition for weight management Diabetes Type II
3. Nutrition for weight management in hypertension
4. Nutrition for weight management in atherosclerosis
5. Nutrition for weight management in congestive heart failure.
6. Medical Nutrition therapy for nephritis.
7. Medical Nutrition therapy for acute renal failure
8. Medical Nutrition therapy for chronic renal failure
9. Medical Nutrition therapy for dialysis patient

CN 308 FOOD SERVICE MANAGEMENT LAB

1. Visits to food Service Units-- Hospital (Public, Private and Speciality)
2. Visit to Industrial Canteens.
3. Visit to Flight Kitchen.
4. Visits to Hostel kitchen.
5. Budget and budgetary control for food service institutions.
6. Layout Design: Space allowances, design development, space relationship, flow of traffic.
7. Develop a design for hospital kitchen.

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY

M.SC CLINICAL NUTRITION

MODEL QUESTION PAPER

CN 101 HUMAN PHYSIOLOGY

Time: 3hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

1. a) Explain the digestion of carbohydrates, proteins and fats in small intestine?
(OR)
b) Explain the syndrome resulting from hypo and hyperactivity of thyroid gland?
2. a) Explain GFR and its regulation
.
b) Explain the mechanism of respiration.
3. a) Explain the composition and functions of cellular components of blood.
(OR)
b) Explain the structure of heart ,cardiac cycle ,cardiac output.
4. a) Explain the structure and function of heart.
(OR)
b) Explain structure and function of bone.

Section B

5x3=15

5. Answer any five of the following
 - a) Structure and function of liver
 - b) Pancreatic hormones
 - c) Structure and function of kidneys
 - d) Explain the mechanism of respiration
 - e) Blood Pressure and its control mechanism.
 - f) Blood Clotting
 - g) Blood brain barrier
 - h) Types of muscle fibres

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY

**M.SC CLINICAL NUTRITION
MODEL QUESTION PAPER
CN 102 HUMAN NUTRITION**

Time: 3hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

1. a) Define BMR and explain the factors that affect BMR,?
(OR)
b) Explain the methods of assessment of energy requirements?
2. a) Explain types, functions, and sources of carbohydrates.
.
b) Explain the types, functions, and sources of proteins.
3. a) Explain the deficiency, toxicity and dietary requirements of Vitamin A.
(OR)
b) Explain the deficiency, sources and dietary requirements of Vitamin C.
4. a) Explain the nutrient interactions- macro and micro nutrients in our body.
(OR)
b) Explain the affect of drugs on the intake of food and nutrients and their absorption.

Section B

5x3=15

5. Answer any five of the following
 - a) Resistant starch
 - b) TEE
 - c) Essential amino acids
 - d) Thermic effect of food
 - e) Prostaglandins.
 - f) Essential fatty acids and its deficiency
 - g) Beri Beri
 - h) Rickets

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
M.SC CLINICAL NUTRITION
MODEL QUESTION PAPER
CN 103 RESEARCH METHODOLOGY AND BIOSTATISTICS

Time: 3hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

1. a) Write about criteria of a good research, Merits and demerits of scientific research.
(OR)
b) Explain different types of research.
2. a) Write about different types of hypothesis, Principles and formulation of Hypothesis ,testing of hypothesis.
(OR)
b) Write about oral and written abstracts and thesis.
3. a) Write about principles of developing a evaluate instruments like Questionnaire , interview and observation.
(OR)
b) Explain the use of computers in research for review collection nd data analysis
4. a) What is the scope of statistics and explain the basic principles of biostatistics and research methodology.
(OR)
b) What is experimental design. Discuss about complete randomized design.

Section B

5x3=15

5. Answer any five of the following
 - a) Meaning and significance of research
 - b) Objectives of research
 - c) Types of research variables
 - d) selection and statement of research problem
 - e) Types of scaling techniques
 - f) Stratified random sampling
 - g) Descriptive statistics
 - h) Probability

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
M.SC CLINICAL NUTRITION
MODEL QUESTION PAPER
CN 104 NUTRACEUTICALS AND FUNCTIONAL FOODS

Time: 3hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

1. a) Define Nutraceuticals . Discuss the need, role in health and their therapeutic applications
(OR)
b) Name antioxidants present in foods explain their role in therapeutic applications
2. a) Explain the rich source of fibre and its role in health
(OR)
b) What is fortification ,write about the technology involved in fortification.
3. a) Explain the methods of protein extraction and leaf protein concentrates
(OR)
b) Write about low fat foods,cholesterol free foods and its health implications
4. a) What are Non nutritive sweeteners. Discuss types of non nutritive sweeteners
(OR)
b) What do you mean by the term food technology.Explain the food Processing improvements through biotechnology

Section B

5x3=15

5 Answer any five of the following

- a) Classification of phytochemicals
- b) Types and sources of functional foods
- c) Diabetic foods
- d) Designer eggs
- e) Synthetic lipids and fat replacers
- f) Legume cakes
- g) Development of sugar free foods
- h) GM foods

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
M.SC CLINICAL NUTRITION
MODEL QUESTION PAPER
CN 201 MANAGEMENT OF HEALTH AND FITNESS

Time: 3hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

1. a) Write about the holistic approach to management of health and fitness including aerobic and anaerobic exercise.
(or)
b) Explain the alternative system for health and fitness
2. a) What is cardio-respiratory system. Write the effect of aerobic exercise on heart rate, blood pressure and lung function.
(or)
b) Write about musculo skeletal systems and what is effect of anaerobic exercise on musculoskeletal system.
3. a) Write about water and electrolyte balance. What do you mean by regime of hydration & dehydration?
(or)
b) Explain about nutrigenic aids and supplements.
4. a) Explain about fitness and health. Write dietary guidelines for obesity management.
(or)
b) How do you manage diabetes mellitus write dietary guidelines and explain about glycemic index and glycemic load.

Section B

5x3=15

5. Answer any five of the following
 - a) Components of physical fitness
 - b) Training benefits of exercise.
 - c) RISK factor
 - d) Endurance, power
 - e) Symptoms and effect of dehydration
 - f) Sports drink
 - g) Weight reduction diet
 - h) Management of CVD

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
M.SC CLINICAL NUTRITION
MODEL QUESTION PAPER
CN 202 NUTRITION IN DISASTER MANAGEMENT AND PUBLIC HEALTH

Time: 3hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

1. a) Write an essay on the factors giving rise to emergency situation in the disaster.
(or)
b) Write an essay on civil and political emergencies.
2. a) What are the causes of malnutrition in emergency situations. Write about major deficiency diseases in emergencies.
(or)
b) Write an essay on the role of immunisation and sanitation in emergencies.
3. a) Write about the role of public nutritionists in the health care delivery.
(or)
b) Write an essay about the determinants of health status and indications of health.
4. a). What are the intervention schemes and programmes operating in India explain in detail.
(or)
b) Write about the socio cultural aspects and dietary patterns and their implications for nutrition and health.

Section B

5x3=15

- 5) Answer any five of the following
- a) Famine and drought
 - b) Flood, cyclone
 - c) PEM
 - d) Control of communicable diseases in emergencies.
 - e) Relationship between health and nutrition.
 - f) National health care delivery system.
 - g) Food production and distribution
 - h) Vitamin A

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY

M.SC CLINICAL NUTRITION

MODEL QUESTION PAPER

CN 203 DIETARY MANAGEMENT

Time: 3hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

1. a) Write an essay on nutritional intervention and diet modification based on interpretation of patient clinical and biochemical data.
(or)
b) Explain about nutrition education and counselling.
2. a) Write about obesity and its types, causes pharmacological and surgical treatment.
(or)
b) Explain about nutritional management in typhoid, tuberculosis and AIDS.
3. a) Write an essay about diet therapy in oesophagitis, Hiatal hernia, gastritis
(or)
b) What are the diseases of the large intestine explain in detail.
4. a) Explain dietary care and Management in diseases of gall bladder and pancreas.
(or)
b) What is enteral tube feeding and parenteral nutrition explain.

Section B

5x3=15

- 5) Answer any five of the following
 - a) Identification of nutritional problem.
 - b) Food exchange list
 - c) Anorexia and nervosa
 - d) Maintenance of reduced weight
 - e) Dumping syndrome
 - f) Haemorrhoids
 - g) Wilson's disease
 - h) Hepatic encephalopathy

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
M.SC CLINICAL NUTRITION
CN 204 PATHOPHYSIOLOGY AND METABOLISM IN DISEASE
Model Question Paper

Time: 3 hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

1. a) Write about cellular proliferation, cancer and its treatment and clinical manifestation.
(OR)
b) Classify different types of Anaemias and its clinical manifestations.
2. a) Explain in detail about alteration of renal and urinary tract function and obstruction.
(OR)
b) What is nephrotic syndrome. Explain about renal failure
3. a) Write about the manifestation of gastro intestinal dysfunction, acute and chronic gastritis.
(OR)
b) Write about pancreatic insufficiency and pancreatitis and hepatitis.
4. a) What are the metabolic changes occurring in musculoskeletal system. Explain in detail.
(OR)
b) Write about the pathophysiology of osteoporosis, osteomalacia and osteoarthritis.

Section B

5x3=15

- 5) Answer any five of the following
- a) Stress and disease
 - b) Hypersensitivity
 - c) Kidney stones
 - d) Glomerulonephritis
 - e) Chron's disease
 - f) Malabsorption syndrome.
 - g) Rheumatoid arthritis
 - h) Gout

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
M.SC CLINICAL NUTRITION
MODEL QUESTION PAPER
CN 301 FOOD MICROBIOLOGY

Time: 3hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

1. a) What is food poisoning and food infection? Explain about the causative agent and symptoms of food poisoning.
(OR)
b) Explain in detail about sources of contamination and spoilage of cereals ,pulses and milk and milk products
2. a) Write an essay about sterilization by physical agents.
(OR)
b) Write in detail about pasteurization.
3. a) What is toxicology, classify food toxicants and factors effecting toxicity of foods.
(OR)
b) what are food toxins and explain about the implications of toxins on human health.
4. a) Explain about the contamination of foods by containers and packaging material
(OR)
b) Write an essay about man made organic chemical food contaminants.

Section B

5x3=15

- 5) Answer any five of the following
- a) General characteristics of fungi
 - b) Contamination of fruits.
 - c) Moist heat sterilization.
 - d) Pasteurization
 - e) Neurotoxicity
 - f) Mutagenicity
 - g) Lathyrogens
 - h) Phytoestrogen

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY
M.SC CLINICAL NUTRITION
MODEL QUESTION PAPER
CN 302 PRODUCT DEVELOPMENT

Time: 3hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

- 1.a) Write about significance of product development and new technologies in driving the food product development.
(OR)
- b) Write about the conditions to be satisfied by an invention to be patentable and filing a patent application.

2. a) What are sensory characteristics of food and flavouring substances used in foods.
(OR)
- b) Explain in detail about difference tests.

3. a) What is importance of food packaging. Principles and types of food packaging
(OR)
- b) Write an essay about packaging laws and regulations as per SWMA and PFA.

4. a) What is purpose of labelling a product. Explain different types of product labelling.
(OR)
- b) What is the role of product marketing and its strategies. What are the logistics for the success of new product

Section B

5x3=15

- 5) Answer any five of the following
 - a) Food product standardization.
 - b) Document to be submitted by patentee
 - c) Paired comparison test.
 - d) Multiple sample difference tests.
 - e) Edible packaging material
 - f) Boil-in-bag package
 - g) Product pricing
 - h) Emblems and names act,1950

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY

M.SC CLINICAL NUTRITION

CN 303 DIET AND DISEASE

Model Question Paper

Time: 3hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

1. a) What is diabetes classify diabetes and plan a diet for type 2diabetes patient
(OR)
b) Write about diagnostic criteria of diabetes? Plan a diet for gestational diabetes and elderly people
2. a) What is hypertension, classify different types of hypertension and its risk factors
(OR)
b) What are the various drugs used in treatment of hypertension and write about DASH diet
3. a) Write about etiology and pathogenesis of atherosclerosis and coronary heart disease.
(OR)
b) Write about nutritional care in cerebrovascular disease and peripheral vascular disease.
4. a) What is glomerular nephritis? Write about its characteristics and principles of dietary management
(OR)
b) Write about causes of acute and chronic renal disease and diet to be followed in that conditions

Section B

5x3=15

- 5) Answer any five of the following
- a) Glycosylated hemoglobin
 - b) Complications related to diabetes
 - c) Types of hypertension
 - d) Risk factors of hypertension
 - e) Congestive heart failure
 - f) Myocardial infarction
 - g) Haemodialysis
 - h) Nephrolithiasis

ADIKAVI NANNAYA UNIVERSITY, RAJAHMUNDRY

M.SC CLINICAL NUTRITION

CN 304 FOOD SERVICE MANAGEMENT

Model Question Paper

Time: 3hours

Max. Marks: 75

Answer all questions all questions carry equal marks

Section A

4x15=60

1. a) Write an essay about types of food service systems
(OR)
b) Write an essay about roles and responsibilities of the health care team
2. a) Write about factors effecting selection of equipment, features of equipment, care and maintenance
(OR)
b) What are the principles, essentials and duties of store keeper
3. a) What is cost, write the elements of cost In detail
(OR)
b) Write an essay about budget and budgetary control for food service institutions.
4. a) Write an essay about delivery and service of food in different institutions
(OR)
b) Write about the process of recruitment of staff, selection of food service management.

Section B

5x3=15

- 5) Answer any five of the following
 - a) Objectives of food service industry
 - b) Organization chart of food service department
 - c) Layout design
 - d) Methods of purchase
 - e) Food cost
 - f) Gross profit
 - g) Table service
 - h) Need and process of communication in service management