Vocational Curriculum – 2012

(With effect from the academic year 2012-2013)

Curriculum of Intermediate Vocational Course
In
DAIRYING

State Institute of Vocational Education
O/o the Commissioner of Intermediate Education,
Andhra Pradesh, Hyderabad

&

Board of Intermediate Education,
Andhra Pradesh, Hyderabad
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Introduction

Radical changes have taken place in education system in India after independence. It is continuous process and should occur for development. The production of large number of education youth has unfortunately not been commensurate with the development of job opportunities.

Agriculture is one of the fields which can absorb a considerable number of unemployed educated youth of the country. For this the candidates should possess technical know how and self confidence to use it effectively. Dairying occupies an allied subject under agriculture. Dairying acquired commercial status, due to introduction of various developmental programs. The Technical know-how in dairying has not descended to village level. The annual milk production in India has increased three to four times since independence and the country stand first in milk production in the world. There is lot of scope for generation of good self employment in dairying.

Vocationalization in the field of dairying will definitely change the pace of rural employment. The course in dairying is designed to train the youth so that there will be improvement in the present scenario of effective and efficient management of dairy enterprise. Now the course in dairying has been revised with latest scientific technologies developed and improved management practices. The course curriculum is so designed and presented to mould the students suitable for self-employment as well as to seek employment with the state departments, private/public firms, cooperatives, educational institutes etc. This is a 2 year course, which consists of three theory and three practical papers per year. Enough provision is made for both the theory and practical aspects. More importance has been given for on the job training practical in all the papers.OJT programme weightages has been substantially increased in both first and second years, so as to expose to field skills.
II. Objective’s of the Course

1. To train the students to scientifically undertake all operations of animal husbandry and dairy technology and to create employment potential and man power for dairy development.
2. To impart training to develop confidence in the management practices in
   a) Raising live stock
   b) Care and management of different classes of livestock
   c) Production of hygienic milk
   d) Manufacture of milk products
   e) Cultivation and preservation of fodder.
3. To train the personal in dairy animal improvement using artificial insemination program
4. To prepare young and enthusiastic entrepreneur for self- employment through dairying and dairy associated activities.
5. To develop abilities for lab Techniques and quality control, techniques to test milk and milk Products.
6. To develop ability for assisting scientific investigation and laboratory work.
7. To prepare dairy processing assistants to assist milk processing and milk products preparation Activities.
8. To prepare dairy husbandry workers as capable organizer/supervisor/Assistant/extension worker for dairy oriented activities in rural as well as urban areas.
9. To train individuals in need based dairy operations like surveying, organization of cattle shows, meals, exhibits etc.
10. To inculcate organizational capability in maintaining dairy societies.
11. To develop facilities for production and sale of cattle feed, fodders, milk products and other dairy based products.
12. To prepare animal husbandry workers as a link between agriculture supporting organizations Institutions and farming community.
13. To inculcate capability for energy conservation through recycling of farm waste.

III. Skills to be provided.

1. To recognize different cattle, buffalo, sheep and goat breeds.
2. To prepare project reports for establishment livestock farms and dairy plants.
3. To calculate feed and fodder requirement for different classes of animals.
4. To prepare quality feeds.
5. To test quality of milk and milk products.
6. Vaccination of animals.
7. First aid and treatment of basic health problems.
8. To diagnose heat period.
10. Assisting the animal during parturition and removal of retained placenta.
11. Techniques in marketing of milk and milk products.
13. Milk collection and transportation.
14. Establishing dairy farm and milk plants.
15. Production of fodder crops.
16. Planning and lay out of dairy farms.
17. Formulation of cattle feeds.
18. Maintenance of stores for dairy farms and dairy plant.
19. To develop entrepreneurship.
20. Maintaining of records and registers.
22. Advertisements for dairy plants/farms.
23. Conducting farmers training.
24. Operation and maintenance of audio-visual aids.
25. Techniques for improvement of milk production.
26. Techniques in disposal of farm waste.
27. Teaching ability for assisting in teaching at +2 level.
28. Raising of calves, heifers.
29. Disposal of dead animal.
30. Transportation of semen.

IV. Job Opportunities.

A. Wage Employment
1. Veterinary Assistant/Livestock assistant/Dairy farm assistant
2. Milk Procurement Supervisor/milk procurement assistant/paid secretary/Dairy Extension assistant
3. Artificial insemination assistant/inseminator/Gopal mithra assistant
4. Dairy Laboratory assistant
5. Farm supervisor/Farm assistant
6. Fodder production assistant/supervisor
7. Dairy products manufacturing assistant/supervisor/processing supervisor/Dairy Technician
8. Milk and milk products sales promotion assistant/marketing supervisor/Distribution assistant
9. Cattle feed Technician/Cattle feed supervisor/feed analysis assistant/cattle feed assistant
10. Assistant in food analysis.
11. Paid secretary cooperative society
12. Instructor/teaching assistant/tutor (+2 level)

B. Self Employment
1. Dairy farm owner
2. Dairy products manufacturer
3. Fodder producer
4. Cattle feed manufacturer
5. Setting up milk parlour
6. Artificial insemination centre owner
7. Milk and milk products distributor
8. Milk collection centre owner
9. Biogas plant operator
10. Contract services for dairy oriented works
V. SCHEME OF INSTRUCTION AND EXAMINATION

5.1 ANNUAL SCHEME OF INSTRUCTION AND EXAMINATION FOR 1ST YEAR FISHERIES COURSE

<table>
<thead>
<tr>
<th>Part-A</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Periods</td>
<td>Marks</td>
<td>Periods</td>
</tr>
<tr>
<td>1. English</td>
<td>150</td>
<td>50</td>
<td>-</td>
</tr>
<tr>
<td>2. General Foundation course</td>
<td>150</td>
<td>50</td>
<td>-</td>
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</tbody>
</table>

**Part-B**

| 3. Paper-I Animal Production and Management| 135     | 50    | 135    | 50    | 270     | 100   |
| 4. Paper-II Feeds and Feeding of Animals  | 135     | 50    | 135    | 50    | 270     | 100   |
| 5. Paper-III Animal Health                 | 135     | 50    | 135    | 50    | 270     | 100   |
| 6. OJT                                      | -       | -     | 365    | 100   | 365     | 100   |
| 7. Total                                   | 705     | 250   | 770    | 250   | 1475    | 500   |

II. On the Job Training for 1st year from 1st August to 30th January at veterinary hospitals by 9.00AM to 12.00 NOON

III. 2nd YEAR DAIRYING COURSE

<table>
<thead>
<tr>
<th>Part-A</th>
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<th>Total</th>
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</thead>
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<td>Periods</td>
<td>Marks</td>
<td>Periods</td>
</tr>
<tr>
<td>1. English</td>
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<td>50</td>
<td>-</td>
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<tr>
<td>2. General Foundation course</td>
<td>150</td>
<td>50</td>
<td>-</td>
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</table>

**Part-B**

| 3. Paper-I Quality Control of Milk and Processing| 110     | 50    | 115    | 50    | 225     | 100   |
| 4. Paper-II Milk Products                    | 110     | 50    | 115    | 50    | 225     | 100   |
| 5. Paper-III Dairy Economics Extension &Entrepreneurship| 110     | 50    | 115    | 50    | 225     | 100   |
| 6. OJT                                      | -       | -     | 450    | 100   | 450     | 100   |
| 7. Total                                   | 630     | 250   | 795    | 250   | 1425    | 500   |

*I+II+III = 1000

*OJT for second year students from 1st November to 30th December at any milk chilling centres / milk products factory.
EVALUATION OF ON THE JOB TRAINING:

The “On the Job Training” shall carry 100 marks for each year and pass marks is 50. During on the job training the candidate shall put in a minimum of 90% of attendance.

The evaluation shall be done in the last week of January.

Marks allotted for evaluation:

<table>
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<tr>
<th>S.No</th>
<th>Name of the activity</th>
<th>Max. Marks allotted for each activity</th>
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<tbody>
<tr>
<td>1</td>
<td>Attendance and punctuality</td>
<td>30</td>
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<tr>
<td>2</td>
<td>Familiarity with technical terms</td>
<td>05</td>
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<tr>
<td>3</td>
<td>Familiarity with tools and material</td>
<td>05</td>
</tr>
<tr>
<td>4</td>
<td>Manual skills</td>
<td>05</td>
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<tr>
<td>5</td>
<td>Application of knowledge</td>
<td>10</td>
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<tr>
<td>6</td>
<td>Problem solving skills</td>
<td>10</td>
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<tr>
<td>7</td>
<td>Comprehension and observation</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>Human relations</td>
<td>05</td>
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<tr>
<td>9</td>
<td>Ability to communicate</td>
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<tr>
<td>10</td>
<td>Maintenance of dairy</td>
<td>10</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
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</table>

NOTE: The On the Job Training mentioned is tentative. The spirit of On the Job training is to be maintained. The colleges are at liberty to conduct on the job training according to their local feasibility of institutions & industries. They may conduct the entire on the job training periods of (363) I year and (450) II year either by conducting classes in morning session and send the students for OJT in afternoon session or two days in week or weekly or monthly or by any mode which is feasible for both the college and the institution. However, the total assigned periods for on the job training should be completed. The institutions are at liberty to conduct On the Job training during summer also, however there will not be any financial commitment to the department.

SCHEME OF INSTRUCTION PER WEEK

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<thead>
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<th>Part-B</th>
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<tr>
<td>3. Paper –I</td>
<td>4</td>
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<td>Paper-II</td>
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<td>Paper-III</td>
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DAIRYING
I YEAR
PART B – VOCATIONAL SUBJECTS
PAPER – I: ANIMAL PRODUCTION AND MANAGEMENT (THEORY)

PERIODS/WEEK: 04  PERIODS/YEAR: 135

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<thead>
<tr>
<th>S.No</th>
<th>NAME OF THE UNIT</th>
<th>No. Of Periods</th>
<th>Weightage in marks</th>
<th>Short answer questions</th>
<th>Essay/Problem questions</th>
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<tbody>
<tr>
<td>1.</td>
<td>Introduction - Confirmation points of different Animals.</td>
<td>5</td>
<td>2</td>
<td>1</td>
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<tr>
<td>2.</td>
<td>Breeds of dairy cattle and buffaloes</td>
<td>15</td>
<td>8</td>
<td>1</td>
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<tr>
<td>3.</td>
<td>Breeding of dairy animals</td>
<td>15</td>
<td>8</td>
<td>1</td>
<td>1</td>
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<tr>
<td>4.</td>
<td>Housing of dairy cattle</td>
<td>15</td>
<td>8</td>
<td>1</td>
<td>1</td>
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<tr>
<td>5.</td>
<td>Care and Management of dairy animals</td>
<td>20</td>
<td>10</td>
<td>2</td>
<td>1</td>
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<td>6.</td>
<td>Activities in a dairy farm</td>
<td>15</td>
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<tr>
<td>7.</td>
<td>Reproductive System – A.I.</td>
<td>20</td>
<td>10</td>
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<td>8.</td>
<td>Lactation and milking methods</td>
<td>15</td>
<td>8</td>
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<tr>
<td>9.</td>
<td>Sheep, Goat Production and management</td>
<td>15</td>
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<td>1</td>
<td>1</td>
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<td><strong>Total</strong></td>
<td><strong>135</strong></td>
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</table>
Syllabus:

1. Introduction – confirmation points
   1.1. Live stock statistics
   1.2. Role of live stock in Indian Economy
   1.3. Common terms used in farm animal management
   1.4. External body parts of dairy animal, sheep and goat.

2. Breeds of dairy cattle and buffalos.
   2.1. Definition of breed – classification of Indian cattle breeds.
   2.2. Indian breeds of dairy cattle.
   2.3. Exotic dairy breeds.
   2.4. Indian buffalo breeds.

3. Breeding of dairy animals and farm records
   3.1. Selection methods of animals
   3.2. Culling of animals
   3.3. Economic characters in dairy cattle
   3.4. Systems of breeding-Inbreeding and Cross breeding
   3.5. State and National breeding policies for enhancing milk production.

4. Housing of dairy animals
   4.1. Selection of site for dairy farm
   4.2. Systems of housing-loose, housing system - conventional dairy barn
   4.3. Cleaning and Sanitation in dairy farm

5. Care and management of dairy animal
   5.1. Care and management of calf
   5.2. Care and management of heifer
   5.3. Care and management of milk animal
   5.4. Care and management of dry and pregnant animal
   5.5. Care and management of bulls and bullocks

6. Activities in the dairy farm
   6.1. Dairy farm routine
   6.2. Restraining methods of dairy animal
   6.3. Dentition and ageing of animals
   6.4. Methods of Identification of dairy cattle
   6.5. Records to be maintained in a dairy farm
   6.6. Common vices of dairy animals
   6.7. Weaning of calf
   6.8. Castration and dehorning
   6.9. Deworming and vaccination program.

7. Reproductive system - Artificial Insemination
   7.1. Reproductive organs of cow and bull
   7.2. Oestrous cycle - symptoms of heat
   7.3. A.I. advantages - disadvantages
   7.4. Collection of semen and evaluation
   7.5. Insemination methods
7.7. Frozen semen- method and preservation
7.8. Pregnancy diagnosis
7.9. Parturition – Assistance and other precautions

8. Lactation
8.1. Mammary gland, structure and development
8.2. Lactogenesis and galactopoeises
8.3. Milk let down
8.4. Milking methods
8.5. Sources of Milk contamination – steps in clean milk production.

9. Sheep Goat production and management
9.1. Important sheep and goat breeds..
9.2 Housing for sheep and goat
9.3. Breeding of sheep and goat.
9.4. Management of different classes of sheep and goat.
9.5 Health Management of sheep and goat.
DAIRYING

1 YEAR

PART B – VOCATIONAL SUBJECTS

PAPER – I: ANIMAL PRODUCTION AND MANAGEMENT [PRACTICALS]

PERIODS/WEEK: 04

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<td>1.</td>
<td>Confirmation points of different animals.</td>
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<td>2.</td>
<td>Breeds</td>
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<td>3.</td>
<td>Breeding of animals</td>
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<td>05</td>
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<td>4.</td>
<td>Housing for animals</td>
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<td>5.</td>
<td>Care and management of animals</td>
<td>20</td>
<td>07</td>
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<td>6.</td>
<td>Activities in dairy farm</td>
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<td>07</td>
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<td>7.</td>
<td>Reproductive system and A.I.</td>
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<td>07</td>
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<td>8.</td>
<td>Lactation and milking methods</td>
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<td>9.</td>
<td>Sheep, Goat production and management</td>
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Syllabus:

1. Confirmation points of different animals
   1.1. Confirmation points of cow.
   1.2. Confirmation points of bull.
   1.3. Confirmation points of sheep.
   1.4. Confirmation points of goat.

2. Breeds
   2.1. Identification of Cattle breeds.
   2.2. Identification of Buffalo breeds.
   2.3. Identification of sheep breeds.
   2.4. Identification of goat breeds.

3. Breeding of animals
   3.1. Selection of cow and buffalo by score card method.
   3.2. Culling of animals.
   3.3. Working of Inbreeding programmes.
   3.4. Working of cross breeding programmes.
   3.5. Working of grading up programmes.

4. Housing of animals
   4.1. Floor plans for loosed housing system
   4.2. Floor plans for conventional system
   4.3. Floor plans for single row, double row, face to face and tail to tail system.
   4.4. Housing for sheep
   4.5. Housing for goat
   4.6. Cleaning and sanitation of animal sheds.

5. Care and management of animals
   5.1. Management of Calf
   5.2. Management of heifer
   5.3. Management of milch animal
   5.4. Management of dry and pregnant animal
   5.5. Management of bull and bullock
   5.6. Management of different classes of sheep
   5.7. Management of different classes of goat

6. Activities in dairy farm
   6.1. Feeding of colostrums of calf
   6.2. Weaning of calf
   6.3. Deworming
   6.4. Vaccination schedule for dairy animal
   6.5. Vaccination schedule for sheep
   6.6. Vaccination schedule for goat
   6.7. Castration
   6.8. Dehorning, Deticking in sheep and goat
   6.9. Grooming and washing of animals
   6.10. Animal restraining methods
   6.11. Preparation of animals for shows.
   6.12. Farm routine
   6.13. Study of farm records.
   6.15. Observation of dentition and ageing of animals
   6.16. Identification methods for animals.
7. **Reproductive system and A.I.**
   7.1. Reproductive organs of female animal
   7.2. Reproductive organs of male animal
   7.3. Preparation and study of artificial vagina
   7.4. Sterilization of A.I. equipment
   7.5. Demonstration of semen collection methods.
   7.6. Examination of semen
   7.7. Maintenance of A.I. records.
   7.8. Practicing of A.I.
   7.9. Study of obstetrical equipment

8. **Lactation and milking methods**
   8.1. Hand milking
   8.2. Clean milk production steps

9. **Sheep, goat production and management**
   9.1. General management for sheep and goat
   9.2. Weaning of lamb and kid.
   9.3. Management of different classes of sheep and goat
<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Unit</th>
<th>No. Of Periods</th>
<th>Weightage in marks</th>
<th>Short answer questions</th>
<th>Essay/Problem questions</th>
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<td>1</td>
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<td>Common Feeds and Fodders</td>
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<td>Formulation of rations</td>
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Syllabus:

1. Digestive System:
   1.1. Digestive system of ruminants.
   1.2. Digestion of carbohydrates, Proteins & Fats in ruminants

2. Common Feeds and Fodders:
   2.1. a) Classification of Nutrients and their role in Animal nutrition - water, crude fiber, ether extract, Proteins, Minerals Vitamins and Nitrogen free extract
   b) Importance of analysis (proximate) of feeds
   2.2. Classification of Feeds
      a) Roughages-Leguminous, Non leguminous - green and dry
      b) Concentrates - Energy and Protein Feeds
      c) Feed Supplements - Minerals and Vitamins
      d) Feed additives - Hormones and antibiotics
   2.3. Importance of unconventional feeds
   2.4. Composition of Commonly used Feeds and Fodders

3. Formulation of Rations:
   3.1. Definition of Ration and Feeding Standards
   3.2. Desirable Characters of Good ration
   3.3. Thumb rules of Feeding Cattle and Buffalos, sheep and goat.
   3.4. Principles Formulation of rations for different classes of animals
   3.5. Formulation of milk replacer and calf starter
   3.6. Formulation of concentrate feed

4. Feeding of Animal
   4.1. Importance of Feeding in dairy animal production
   4.2. Feeding of newly born calf
   4.3. Feeding of calf up to 1 year age
   4.4. Feeding of Heifer
   4.5. Feeding of milch and pregnant animal
   4.6. Feeding of Dry animal
   4.7. Feeding newly calved cows and Buffalos
   4.8. Feeding of animals during drought and cyclone
   4.9. Feeding of different Classes of Sheep.
   4.10. Feeding of different Classes of Goat.

5. Quality control of feeds
   5.1. Procurement and storage of feed ingredients
   5.2. Methods of detection of Feed Adulterants
   5.3. Quality control of finished feed
   5.4. Packing and forwarding of feeds
   5.5. Storage of concentrates - space requirement
   5.6. Cleaning and Fumigation of stores
   5.7. Use of Pesticides in feed stores to control Biological Agents
   5.8. Spoilage of feeds during storage

6. Feed plant
   6.1. Methods of purchasing, procurement of feed ingredients and their physical evaluation
   6.2. Grinding of Feed ingredients - Equipment
   6.3. Mixing of Feed ingredients - Equipment
   6.4. Pelleting process - Advantages - Disadvantages
   6.5. Compounding of Feeds - objectives - Advantages
7. Fodder production
   7.1. Study of soils for fodder production
   7.2. Importance of green fodder feeding for economic milk production
   7.3. Crop rotation
   7.4. Study of different forage farm equipment-Ploughing, Harrowing, Planking etc.
   7.5. General principles of irrigation, fertilizers requirement in fodder production
   7.6. Cultivation practices of:
       a. Legume Annuals - cow pea, sunhemp, pillipesera, Berseem
       b. Legume Perennial - Lucern, field beans
       c. Non legume Annual - Jowar, Maize, Bajra etc.
       d. Non legume Perennial - Para, Guinea, Hybrid Napier
       e. Legume pasture - Stytops, Siratro etc.
       f. Non legume pasture - Anjan grass, rhodes etc.
       g. Fodder trees - Subabul, Avisa, Hedge lucern etc.
   7.7. Silvi pasture - Hortipastures

8. Fodder Conservation
   8.1. Chaffing of fodders - Advantages - Disadvantages
   8.2. Improvement of low quality roughages and non conventional feeds-urea paddy straw treatment
   8.3. Aims of Fodder conservation - Advantages and disadvantages
   8.4. Design of silage pit
   8.5. Method of silage making
   8.6. Importance of feeding silage to animals
   8.7. Method of Hay making
   8.8. Preparations of vermin-culture from compost
## DAIRYING

### I YEAR

**PART B – VOCATIONAL SUBJECTS**

**PAPER – II: FEEDS AND FEEDING OF ANIMALS [PRACTICALS]**

**PERIODS/WEEK: 04**

**PERIODS/YEAR: 135**

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Syllabus:

1. Digestive system
   1.1. Sketch diagram of digestive system of cattle
   1.2. Sketch diagram of digestive system of sheep
   1.3. Sketch diagram of digestive system of goat

2. Common Feeds
   2.1. Identification of common feed ingredients
   2.2. Identification of common unconventional ingredients
   2.3. Identification of feed supplements
   2.4. Identification of feed additives
   2.5. Identification of Agro-industrial by products

3. Formulation of rations
   3.1. Thumb rules of feeding cattle and buffalos
   3.2. Formulation of milk replacer and calf starter
   3.3. Formulation of ration for milch animals
   3.4. Formulation of ration for pregnant animals
   3.5. Formulation of ration for dry animals
   3.6. Formulation of ration for work animals

4. Feeding of animals
   4.1. Feeding of new born animals
   4.2. Feeding of pregnant animals
   4.3. Feeding of milch animals
   4.4. Feeding of dry animals
   4.5. Feeding during cyclone
   4.6. Feeding of draught period

5. Quality control of feeds
   5.1. Sampling of feed ingredients for examination
   5.2. Detection of adultrants in feed ingredients
   5.3. Quality control tests for feed ingredients
   5.4. Identification of spoiled feed ingredients

6. Feed Plant
   6.1. Grinding of feed ingredients
   6.2. Mixing of feed ingredients
   6.3. Preparation of mash feed
   6.4. Packing and labeling of feeds
   6.5. Cleaning and Fumigation of feed stores
   6.6. Preparation of urea-molasses, salt bricks
   6.7. Visit to feed plant
   6.8. Visit to markets to know prices and quality of ingredients

7. Fodder Production
   7.1. Study of soil types
   7.2. Study of forage farm implements/ equipments
   7.3. Application of fertilizers
   7.4. Irrigation of fodder crops
   7.5. Weeding of fodder crops
7.6. Harvesting of fodder crops
7.7. Compost making – vermiculture preparation
7.8. Visit to fodder farm
7.9. Visit to grass lands

8. **Fodder conservation**
8.1. Chaffing of fodder
8.2. Forage farm records
8.3. Silage preparation
8.4. Hay making
### DAIRYING

**I YEAR**

**PART B – VOCATIONAL SUBJECTS**

**PAPER – III: ANIMAL HEALTH [THEORY]**

**PERIODS/WEEK: 04**

**PERIODS/YEAR: 135**

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Syllabus:

1. Health
   1.1. Definitions of health and disease
   1.2. Signs of health and ill health
   1.3. Recording body temperature, pulse and respiration rates
   1.4. Normal values of body temperature, pulse and respiration rates

2. First aid
   2.1. Definition of first aid and its principles
   2.2. Attending to traumatic condition
   2.3. Attending to poisoning cases
   2.4. Attending to obstetrical difficulties
   2.5. First aid to burns and scalds
   2.6. Attending to fracture
   2.7. First aid kit
   2.8. First aid during natural calamities

3. Bacterial diseases
   3.1. Classification of dairy animal diseases - Bacterial, viral, protozoal, helmenthic, metabolic etc.
   3.2. Anthrax
   3.3. Black Quarter
   3.4. Brucellosis
   3.5. Vibriosis
   3.6. Haemorrhagic septicaemia
   3.7. Tuberculosis
   3.8. Johnes disease
   3.9. Leptospirosis
   3.10. Listeriosis
   3.11. Contagious bovine pleuropneumonia
   3.12. Tetanus
   3.15. Mastitis
   3.16. Pneumonia

4. Viral diseases
   4.1. Rinderpest
   4.2. Foot and mouth disease
   4.3. Rabies
   4.4. Cow pox
   4.5. Common Viral diseases of sheep and goat

5. Protozoan diseases
   5.1. Anaplasmosis
   5.2. Babesiosis
   5.3. Theileriasis
   5.4. Trypanosomiasis
   5.5. Leishmaniasis
   5.6. Coccidiosis
   5.7. Amaebiasis

6. Helminthic and External parasitic diseases
   6.1. Round worms
   6.2. Tape worms
   6.3. Liver flukes
   6.4. Flies
6.5. Ticks and mites
6.6. Common helminthic and external parasites of sheep and goat

7. Mycotic diseases
   7.1. Ring worm
   7.2. Actinomycosis
   7.3. Aspergillosis

8. Production & Systemic diseases.
   8.1. Bloat
   8.2. Ketosis
   8.3. Milk fever
   8.4. Downer Cow syndrome.
   8.5. Enteritis.

9. Reproductive disorders
   9.1. Anaestrum
   9.2. Dystocia
   9.3. Retained placenta
   9.4. Endometritis
   9.5. Pyometra
   9.6. Infertility - causes and prevention
   9.7. Other diseases associated with reproduction

10. Prevention of diseases
    10.1. Surveillance of animal diseases
    10.2. Outbreak reports
    10.3. Action plans for prevention of diseases for different seasons
    10.4. Isolation
    10.5. Quarantine
    10.6. Vaccination for dairy animals, sheep and goat
    10.7. Deworming – cattles, sheep and goat
    10.8. Disinfection
    10.9. Disposal of Carcasses
    10.10. Action plan during disease out break
    10.11. Sterilization of equipment- hot/cold/chemical methods
DAIRYING COURSE

DAIRYING

I YEAR

PART B – VOCATIONAL SUBJECTS

PAPER – III: ANIMAL HEALTH [PRACTICALS]

PERIODS/WEEK: 04       PERIODS/YEAR: 135

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Syllabus:

1. **Health**
   1.1. Recording body temperature, pulse and respiration rates
   1.2. Identification of sick animals

2. **First Aid**
   2.1. Study of first aid kit
   2.2. Maintenance of first aid kit
   2.3. First aid to burns and scalds

3. **Specimens Collection**
   3.1. Collection of various specimens for examination
   3.2. Collection of dung sample
   3.3. Collection of Blood
   3.4. Collection of milk samples

4. **Laboratory Examination**
   4.1. Operation of compound microscope
   4.2. Examination of blood smear
   4.3. Preparation of blood smear
   4.4. Examination of blood smear
   4.5. Examination of milk sample for mastitis
   4.6. Examination of skin scrapings

5. **Preparation of Medicines**
   5.1. Preparation of ointments
   5.2. Preparation of tonics/mixtures

6. **Special Techniques**
   6.1. Practicing subcutaneous injection
   6.2. Practicing intramuscular injection
   6.3. Practicing intravenous injection
   6.4. Practicing drenching
   6.5. Attending to fractures
   6.6. Attending obstetrical difficulties
   6.7. Attending to poisoning cases
   6.8. Practicing of wound dressing
   6.9. Attending traumatic condition

7. **Vaccination**
   7.1. Preparation of list of diseases that may occur in different seasons
   7.2. Preparation of outbreak report
   7.3. Preparation of vaccination programmes
   7.4. Publicity for vaccination programmes
   7.5. Vaccine indent and transport
   7.6. Maintenance of vaccine storage
   7.7. Practicing vaccination
   7.8. Attending to vaccine reacted animals
## II YEAR

**PART B – VOCATIONAL SUBJECTS**

**PAPER – I: QUALITY CONTROL OF MILK AND PROCESSING [THEORY]**

**PERIODS/WEEK: 04**

**PERIODS/YEAR: 110**

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Syllabus:

1. **Composition of Milk**
   1.1. Definition of milk, PFA designated milks
   1.2. Composition of milk from different species
   1.3. Detailed composition of milk
   1.4. Factors affecting composition of milk

2. **Physico Chemical Properties of milk**
   2.1. Colour and flavor
   2.2. PH and Acidity
   2.3. Specific gravity of milk
   2.4. Freezing and boiling point
   2.5. Viscosity and surface tension
   2.6. Off- flavours

3. **Adultrants and Preservatives**
   3.1. Common Adultrants in milk – their detection
   3.2. Common preservatives in milk – their detections
   3.3. Adultration of buffalo milk with cow milk – Hansa test
   3.4. Effects of adultrants and preservation on human health

4. **Microbiology of Milk**
   4.1. Types of micro-organisms present in milk
   4.2. Milk borne diseases (pathogens)
   4.3. Microbial standards of raw and pasteurized milk
   4.4. Microbial spoilage of milk

5. **Estimation of microbes in milk**
   5.1. MBRT and RRT tests
   5.2. Direct Microscopic count(DMC test)
   5.3. Standard plate count
   5.4. Coliform count
   5.5. Yeast and mould count
   5.6. Tests for pathogenic bacteria of milk

6. **Milk Reception**
   6.1. Milk collection and transportation
   6.2. Methods of milk preservation
   6.3. Milk reception at dock (unloading, weighing, sampling, grading, dumping)
   6.4. Milk chilling methods and storage

7. **Filtration and cream separation**
   7.1. Milk Filtration method
   7.2. Milk clarification
   7.3. Cream separation methods
   7.4. Cream separator – parts and arrangements of parts
   7.5. Factors affecting efficiency of cream separator
   7.6. Milk standardization for Fat and SNF procedure

8. **Heat treatment to milk**
   8.1. Pasteurization – definition – objectives, advantages and disadvantages
   8.2. Types of pasteurization
   8.3. Batch pasteurization
   8.4. HTST pasteurization
   8.5. UHT pasteurization
   8.6. Sterilization of milk
   8.7. Homogenization of milk definition, advantages, disadvantages
   8.8. Packing of milk (prepack) and storage
9. **Cleaning and Sanitization**
   9.1. Detergents and sanitizers - desirable characters
   9.2. Common detergents and sanitizers used dairy plant
   9.3. Cleaning and sanitization - methods - hand, machine and CIP systems
   9.4. Cleaning and sanitization of cans - types of can washers
   9.5. Cleaning and sanitization of HTST pasteurizer and other equipment
   9.6. Dairy effluents - treatment measures

10. **Steam and Refrigeration**
    10.1. Properties of steam
    10.2. Steam boilers - types - water tube and fire tube
    10.3. Steam requirements in dairy
    10.4. Direct and indirect refrigeration systems
    10.5. Vapour compression cycle, compressor types and constructional details
    10.6. Bulk cooler, plate chillers (shell and tube chillers)
    10.7. Common problems in refrigeration system and remedies
## DAIRYING

### II YEAR

**PART B – VOCATIONAL SUBJECTS**

**PAPER – I: QUALITY CONTROL OF MILK AND PROCESSING [PRACTICALS]**

PERIODS/WEEK: 04

PERIODS/YEAR: 115

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Syllabus

1. **Sampling Techniques**
   1.1. Sampling of milk for physical and chemical examination
   1.2. Platform tests for milk
   1.3. Sampling of milk for microbiological analysis

2. **Physicochemical quality control test**
   2.1. Fat test by Gerber’s method
   2.2. Determination of specific gravity of milk by lacto meter
   2.3. Determination of titratable acidity in milk
   2.4. Sediment test
   2.5. Clots on boiling
   2.6. Platform test
   2.7. Detection of adulteration in milk
   2.8. Detection of preservatives in milk

3. **Microbiological quality test**
   3.1. Methylene blue reduction (MBR) test
   3.2. Resazurin Test
   3.3. Standard Plate count test (SPC)
   3.4. Direct microscopic (DMC) test
   3.5. Coliforms count
   3.6. Yeast and Moulds

4. **Unit operations in milk processing**
   4.1. Study of activities at reception dock
   4.2. Chilling of milk – plate chiller and farm milk cooler
   4.3. Study of filters and clarifiers
   4.4. Study of cream separator parts-assembling
   4.5. Separation of cream
   4.6. Study of HTST pasteurizer
   4.7. Packing of milk – bottles and cans
   4.8. Packing of milk-sachets (Prepack)
   4.9. Preparation of sterilized milk-batch method
   4.10. Study of tetra packing
   4.11. Cleaning and sanitization of dairy equipment

5. **Steam and refrigeration**
   5.1. Study of milk sterilizer
   5.2. Study of Boilers
   5.3. Study of refrigeration plant
   5.4. Study of bulk milk cooler

6. **Visits**
   6.1. Visit to milk chilling centre
   6.2. Visit to milk products factory
   6.3. Study of milk collection
   6.4. Study of milk transportation
## DAIRYING

### II YEAR

**PART B – VOCATIONAL SUBJECTS**

**PAPER – II: MILK PRODUCTS [THEORY]**

**PERIODS/WEEK: 04**

**PERIODS/YEAR: 110**

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</table>
Syllabus:

1. **Liquid milks**
   1.1. Flavored milks
   1.2. Sterilized milk
   1.3. Toned milk
   1.4. Double toned milk
   1.5. Recombined milk
   1.6. Reconstituted milk
   1.7. Standardized milk
   1.8. Irradiated milk
   1.9. Humanization of milk

2. **Fat rich products**
   2.1. Cream
      2.1.1. Definition, composition and types of cream
      2.1.2. Methods – gravity and centrifugal
      2.1.3. Factors affecting cream separation
   2.2. Butter
      2.2.1. Definition, composition and legal standards
      2.2.2. Methods of manufacture – desi method
      2.2.3. Creamery method of butter preparation
      2.2.4. Types and uses of butter
   2.3. Ghee
      2.3.1. Definition – composition and legal standards
      2.3.2. Desi method of ghee preparation
      2.3.3. Preparation of ghee from cream
      2.3.4. Prestratification method
      2.3.5. Agmark grading

3. **Ice cream**
   3.1. Definition, composition, legal standards
   3.2. Classification of ice creams
   3.3. Figuring of ice cream nut
   3.4. Method of manufacture of ice cream
   3.5. Role of ingredients in Ice cream
   3.6. Overrun in Ice cream
   3.7. Softy ice cream

4. **Fermented milk products**
   4.1. Starter cultures- importance of types
   4.2. Classification of fermented milks
   4.3. Dahi- srik hand
   4.4. Yoghurt
   4.5. Classification of cheese varieties
   4.6. Cheddar cheese
   4.7. Cottage cheese
   4.8. Processed cheese
5. Concentrated and dried milks
   5.1. Classification of concentrated milks
   5.2. Preparation of condensed milk
   5.3. Preparation of evaporated milks
   5.4. Dried milks – definition – types and standards
   5.5. Drum dried power
   5.6. Spray dried milk power

6. Indigenous milk products
   6.1. Classification of indigenous milk products with examples
   6.2. Khoa
   6.3. Khoa based sweets
   6.4. Channa
   6.5. Channa based sweets
   6.6. Paneer
   6.7. Kheer
   6.8. Kulfi

7. Dairy by products
   7.1. Classification of dairy by products
   7.2. Skim milk – utilization
   7.3. Whey – utilization
   7.4. Butter milk – utilization
   7.5. Ghee residue – utilization

8. Packing and storage of milk products
   8.1. Definition – objectives of packing
   8.2. Packing materials
   8.3. Packing of milk products
   8.4. Storage of milk products – desirable conditions
### DAIRYING COURSE

#### DAIRYING

**II YEAR**

**PART B – VOCATIONAL SUBJECTS**

**PAPER – II: MILK PRODUCTS [PRACTICALS]**

**PERIODS/WEEK: 04**

**PERIODS/YEAR: 115**

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<td>Fat rich products</td>
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<td>3.</td>
<td>Ice cream</td>
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</table>
Syllabus:

1. **Liquid milk**
   - 1.1. Preparation of pasteurized flavoured milk
   - 1.2. Preparation of sterilized flavoured milk
   - 1.3. Preparation of toned milk
   - 1.4. Preparation of double toned milk
   - 1.5. Preparation of Recombined milk
   - 1.6. Preparation of reconstituted milk
   - 1.7. Preparation of standardized milk

2. **Fat rich products**
   - 2.1. Study of cream separator
   - 2.2. Cream separation
   - 2.3. Desi method of butter preparation
   - 2.4. Creamy method of butter preparation
   - 2.5. Desi method of ghee preparation
   - 2.6. Creamy method of ghee preparation
   - 2.7. Study of Agmark labeling of ghee

3. **Ice Cream**
   - 3.1. Study of ingredients for ice cream
   - 3.2. Figuring of ice cream
   - 3.3. Ice cream preparation
   - 3.4. Softy ice cream preparation

4. **Fermented milk products**
   - 4.1. Dahi preparation
   - 4.2. Srikhand preparation
   - 4.3. Cottage cheese preparation

5. **Concentrated and dried milk**
   - 5.1. Study of condensed milk
   - 5.2. Study of evaporated milk
   - 5.3. Study of dried milks

6. **Ingredients in milk products**
   - 6.1. Khoa preparation
   - 6.2. Peda Preparation
   - 6.3. Burfi Preparation
   - 6.4. Kalakand Preparation
   - 6.5. GulabJamun Preparation
   - 6.6. Preparation of Channa
   - 6.7. Preparation of Sandesh
   - 6.8. Preparation of Rosogolla
   - 6.9. Preparation of paneer
   - 6.10. Preparation of Kheer
   - 6.11. Preparation of Kulfi

7. **Dairy by products**
   - 7.1. Preparation of flavoured skim milk
   - 7.2. Preparation of butter milk
   - 7.3. Preparation of wheyvit

8. **Other Items**
   - 8.1. Study of packing materials
   - 8.2. Visit to dairy plants
   - 8.3. Survey of dairy products consumption
   - 8.4. Marketing of milk
   - 8.5. Marketing of milk products
DAIRYING COURSE

DAIRYING

II YEAR

PART B – VOCATIONAL SUBJECTS

PAPER – III: DAIRY ECONOMICS EXTENSION & ENTERPRENEURSHIP (THEORY)

PERIODS/WEEK: 04

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<td>III</td>
<td>Dairy development programmes</td>
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<td>IV</td>
<td>Dairy Cooperatives</td>
<td>15</td>
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<tr>
<td>V</td>
<td>Marketing</td>
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<tr>
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PERIODS/YEAR: 110
Syllabus:

1. Dairy Economics
   1.1. Scope and importance of principles of economics in Dairying
   1.2. Economic viability for different size of dairy enterprises
   1.3. Economic principles involved to enhance benefits in dairying
   1.4. Economic institutions supporting dairy development programmes
   1.5. Projects reports to be submitted for financial institutions for 2, 10, 50 and 100 animal dairy farms
   1.6. Project reports for 5,000 litres and 50,000 litres processing centres

2. Milk procurement
   2.1. Systems of Milk collection
   2.2. Systems of Milk pricing
   2.3. Principles involved in pricing of milk products
   2.4. Planning for milk collection and transportation routes.
   2.5. Measures to enhance milk collection during lean season
   2.6. Strategies for improvement in collection comparing with competitors

3. Dairy development programmes
   3.1. Various dairy development programmes available.
   3.2. White revolution- Aims- impact on economy of rural people
   3.3. Operation flood- different phases- aims and achievements
   3.4. National Technology mission for dairy development
   3.5. Milk mission in A.P.
   3.6. Role of voluntary organizations in dairy development
   3.7. Concept of socio-economic and cultural changes for dairying programmes.

4. Dairy cooperatives
   4.1. History of cooperative movement in India.
   4.2. Cooperative movement in Dairy Industry.
   4.3. Milk cooperatives - Anand pattern
   4.4. Aims, and functioning of village milk cooperative society.
   4.5. Structure and activities of district milk union.
   4.6. Role of state milk cooperative federations
   4.7. Records and registers in a milk society
   4.8. Coordination with other institutions concerned with dairy development.
   4.9. Insurance of dairy animal and processing center.

5. Marketing
   5.1. Principles of marketing
   5.2. Marketing of dairy animals
   5.3. Marketing plans for liquid milks
   5.4. Strategy for marketing of milk products
   5.5. Role of advertisement for market promotion
   5.6. Analysis of consumer demand and acceptance
   5.7. Role of salesman and marketing personalities in marketing of dairy products.

6. Dairy accounts
   6.1. General principles of account keeping
   6.2. Single and double entry system
   6.3. Various records pertaining to financial aspects
   6.4. Preparation of balance sheet
   6.5. Auditing

7. Dairy Extension
   7.1. Role of Extension in dairy development
   7.2. Dairy Extension- methods
7.3. Role of audiovisuals in Dairy development  
7.4. Selection of Extension methods for effective transfer technology  
7.5. Communications process-aims objectives and problems  
7.6. Role of information technology in dairy extension.  
7.7. Organizations of training programmes, cattle shows, exhibitions etc.,  
7.8. Evaluation of training programmes  

8. Dairy Entrepreneurship  
8.1. Entrepreneur-his behavior  
8.2. Dairying as self-employment  
8.3. Entrepreneur cycle for dairying  
8.4. Entrepreneur development for rural youth  
8.5. Programmes for entrepreneurship development in dairying  
8.6. Risks in self-employment and remedies.
## DAIRYING

### II YEAR

#### PART B – VOCATIONAL SUBJECTS

**PAPER – III: DAIRY ECONOMICS EXTENSION & ENTERPRENEURSHIP [PRACTICALS]**

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<td>Dairy Cooperatives</td>
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<td>5</td>
<td>Marketing</td>
<td>18</td>
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<td>6</td>
<td>Dairy accounts</td>
<td>13</td>
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Syllabus:

1. Dairy Economics
   1.1. Preparation of project reports for 2,10,50 and animal units
   1.2. Preparation of project reports for 5000 and 50000 litres units
   1.3. Calculation of cost of milk production
   1.4. Calculation of cost of milk products

2. Milk Procurements
   2.1. Working on various systems of milk pricing
   2.2. Planning of milk collection
   2.3. Planning for transportation routes

3. Dairy developmental programmes
   3.1. Survey for selection of milk shed area
   3.2. Report on milk shed area survey
   3.3. Study of dairy animal insurance forms
   3.4. Procedure for claiming insurance benefits

4. Dairy Cooperatives
   4.1. Visit to village milk cooperative society
   4.2. Visit to District milk union
   4.3. Records maintained in milk societies

5. Marketing
   5.1. Planning for marketing of liquid milk
   5.2. Survey for consumer demand and satisfaction
   5.3. Planning for advertisement
   5.4. Feedback from consumer
   5.5. Development of strategies of the feedback

6. Dairy accounts
   6.1. Maintenance of financial records and registers
   6.2. Preparation of balance sheet
   6.3. Audit systems

7. Dairy Extension
   7.1. Preparation of extension of teaching materials such as posters, charts, bulletins and models etc.
   7.2. Organization of milk producers meeting
   7.3. Planning for farmer’s training
   7.4. Planning for organization of cattle shows
   7.5. Group discussion for dairy development

8. Entrepreneurship
   8.1. Development of Entrepreneurship among rural youth
   8.2. Visits to dairy development institutions
   8.3. Case study of successful dairy farmer
   8.4. Case study of successful processing unit
## LIST OF EQUIPMENTS

1. Iron Branding set (Letters 0 to 9)  1
2. Tattooing letter 0 to 9  
3. Ear Tagging Machine  2
4. Ear Tags – Plastic  20
   - Metal  20
5. Tattooing forceps  1
6. Liquid Nitrogen  3 ltrs
7. Ice packs  2
8. Burdizzon castrator  1
9. Cotton ropes  2 bundles
10. Ear (Nothing) pincer (scissor)  1
11. Bull Nose punch  1
12. Bull Nose Ring  1
13. Bull leader (or) Bull pole  1
14. Cradles or beads  2 sets
15. Drenching Bamboo  2
16. First Aid Kit  1
17. Enamel Tray  1
18. Sterilizer  1
19. Hair Clipper  1
20. Trocar and Canula  1
21. Electric Dehorner  1
22. Forceps  Set-1
23. Scissor  Set-1
24. Syringes and Needles  Set-1
25. Probang tube  1
26. Irrigator  1
27. Mouth Gag  1
28. Trevis  1
29. Milking cans 10 ltrs.  4
30. Measurers (1 ltr. 500 ml, 100 ml)  3
31. Buckets 16 ltrs.  2
32. Milk feeding cup  2
33. Strip cup  2
34. Neck Chains  1
35. Chaff Cutter  1
36. Grinder  1
37. Artificial Vagina Set  1
38. Liner for A.V.  5
39. Cones for A.V.  5
40. Refrigerator – 175 ltrs  1
41. Speculum  1
42. Stiff brushes  2 No.s
43. Floor brushes  2 No.s
### DAIRYING COURSE

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<tr>
<td>45. Insemination Guns</td>
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<tr>
<td>46. Haemocytometer</td>
<td>2</td>
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<tr>
<td>47. Hot plate</td>
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<tr>
<td>48. Water distillation apparatus</td>
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<tr>
<td>49. Pestle and Mortar</td>
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<td>50. Spirit lamps</td>
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<td>51. Insemination catheters</td>
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<td>52. Autoclave</td>
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<td>53. Hot Air oven</td>
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<td>54. PH Meter</td>
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<td>55. Microscope</td>
<td>1</td>
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<td>56. Waterbath</td>
<td>1</td>
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<td>57. Sediment Testing equipment</td>
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<td>58. Butter scoop</td>
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<td>59. Frying pan 2 ltrs</td>
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<td>62. Bottle crates</td>
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<td>63. Sachet sealing equipment</td>
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<td>64. Measuring Tape</td>
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<td>65. Knife</td>
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<td>67. Miko Tester</td>
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<td>68. Milk cans 40 ltrs</td>
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<td>69. Gerbers centrifuge</td>
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<td>70. Butter Chum</td>
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<td>71. Butter worker</td>
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<td>72. Icecream Freezer</td>
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<td>73. Cream separator</td>
<td>1</td>
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<tr>
<td>74. Deep Fridge</td>
<td>1</td>
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<tr>
<td>75. Bhagona 3 ltrs</td>
<td>5</td>
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<tr>
<td>76. Hand Stirrer</td>
<td>3</td>
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<tr>
<td>77. Karahi</td>
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<td>78. Blender/Mixer</td>
<td>1</td>
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<tr>
<td>79. Gas stove with cylinder</td>
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### List of Glassware

1. Butyrometer                            | 2 doz   |
2. Lactometer                             | 15      |
3. Milk pipettes (10.75 ml)               | 25      |
4. Pipette (10 ml double bulb)            | 20      |
5. Pipettes (10 ml)                       | 15      |
6. Pipette (1 ml) Single bulb             | 10      |
7. Pipettes (1 ml)                        | 10      |
8. Petridishes 20 No.s
9. Test Tubes 50
10. Clinical Thermometers 5
11. Thermometers[F] 5
12. Beakers (1000 ml) 12
13. Beakers (500 ml) 12
14. Beakers (250 ml) 12
15. Beakers (100 ml) 12
16. Conical flasks (250 ml) 12
17. Ice cream cups 25
18. Measuring Cylinders (100 ml, 500 ml, 1000 ml) 5
19. Semen collection vials 2
20. Syringe 2 ml 24
21. Syringe 5 ml 24
22. Syringe 10 ml 24
23. Syringe 20 ml 24
24. Automatic tilt measure for Acid 3
25. Automatic tilt measure for Amyl Alcohol 3
26. Milk Bottles 250 ml 50
27. Kjeldhal flask 500 ml 5
28. Round bottom flask 100 ml 5
29. Conical flask 1000 ml 5
30. Funnels 10 cm dia 5
31. Volumetric flask 100 ml 2
32. Wash bottles 500 ml 5
33. Glass rods 1 kg
34. Glass tubing 1 kg
35. Slides and cover slips 100
36. Indicator bottles 100
37. Drop bottles 2
38. Rubber bulbs for suction 5
39. Gloves 100
40. Brushes to clean glassware 5
41. Glass marking pencil 12
42. Filter paper 11 cm 2 boxes
43. Glass Funnels 5
44. Centrifuge graduated tubes 10
45. Gumboots 2 pairs
46. Glass beads 1 packet

List of Chemical & Consumables

1. Washing Soda 1 kg
2. Liquid Soap 5 ltrs.
3. Bleaching powder 50 kg
4. Sulphuric commercial 10 ltrs.
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<th>Item</th>
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<td>6. Oxalic Acid</td>
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<td>10. Nutrient Agar</td>
<td>500 gms</td>
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<td>11. Macconkeys Agar</td>
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<tr>
<td>12. Potato Dextrage Agar</td>
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<tr>
<td>13. Formaldehyde</td>
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<td>14. Boric Acid</td>
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<tr>
<td>15. Benzoic Acid</td>
<td>100 gms</td>
</tr>
<tr>
<td>16. Salicylic Acid</td>
<td>100 gms</td>
</tr>
<tr>
<td>17. Starch</td>
<td>200 gms</td>
</tr>
<tr>
<td>18. Urea</td>
<td>250 gms</td>
</tr>
<tr>
<td>19. Alcohol</td>
<td>500 ml x 2</td>
</tr>
<tr>
<td>20. Petroleum Ether (40 to 60 deg)</td>
<td>400 ml x 2</td>
</tr>
<tr>
<td>21. Resorcinol</td>
<td>500 gms</td>
</tr>
<tr>
<td>22. Isoamyl Alcohol</td>
<td>500 ml</td>
</tr>
<tr>
<td>23. Tattooing Ink</td>
<td>500 gms</td>
</tr>
<tr>
<td>24. Sodium Alginate</td>
<td>500 gms</td>
</tr>
<tr>
<td>25. Resazin tablets</td>
<td>20</td>
</tr>
<tr>
<td>26. Spirit 500 ml</td>
<td>4 bot</td>
</tr>
<tr>
<td>27. Tincture iodine 500 ml</td>
<td>4 bot</td>
</tr>
<tr>
<td>28. Sodium Carbonate</td>
<td>500 gm</td>
</tr>
<tr>
<td>29. Litmus paper</td>
<td>1 pack</td>
</tr>
<tr>
<td>30. Copper Sulphate</td>
<td>500 gms</td>
</tr>
<tr>
<td>31. Sodium Sulphate</td>
<td>500 gms</td>
</tr>
<tr>
<td>32. Potassium Dicromate</td>
<td>500 gms</td>
</tr>
<tr>
<td>33. Eosin water soluble</td>
<td>125 ml</td>
</tr>
<tr>
<td>34. Nigrosine water soluble</td>
<td>100 ml</td>
</tr>
<tr>
<td>35. Petroleum Jelly/Liquid paraffine</td>
<td>50 gms</td>
</tr>
<tr>
<td>36. Sodium citrate</td>
<td>100 gms</td>
</tr>
<tr>
<td>37. Distilled water</td>
<td>5 ltrs.</td>
</tr>
<tr>
<td>38. Glucose</td>
<td>500 gms</td>
</tr>
<tr>
<td>39. Sodium Chloride</td>
<td>500 gms</td>
</tr>
<tr>
<td>40. Colours and Flavours</td>
<td>1 bot each</td>
</tr>
<tr>
<td>41. RBC diluting fluid</td>
<td>500 ml</td>
</tr>
<tr>
<td>42. Ammonium Sulphate</td>
<td>500 gms</td>
</tr>
<tr>
<td>43. Tee pal</td>
<td>200 ml</td>
</tr>
<tr>
<td>44. Potassium iodide</td>
<td>100 gms</td>
</tr>
<tr>
<td>45. Iodine</td>
<td>25 gms</td>
</tr>
<tr>
<td>46. Bromothymal blue</td>
<td>125 ml</td>
</tr>
<tr>
<td>47. Quick lime</td>
<td>500 gms</td>
</tr>
<tr>
<td>48. Phenol</td>
<td>500 gms</td>
</tr>
<tr>
<td>49. Liquor Ammonia</td>
<td>500 ml</td>
</tr>
</tbody>
</table>
50. Turmeric papers 1 box
51. Cultures (Bacterial) 3
52. Citric Acid 500 gms
53. Super Phosphate 500 gms
54. Rock Phosphate 500 gms
55. Zinc Sulphate 500 gms
56. Branding Ink 500 ml
57. Tattooing Ink 500 ml
58. Neem oil 1 ltr.
59. Castor oil 1 ltr.
60. Zinc oxide 500 gms
61. Vanaspathi 1 kg
62. Sugar 20 kgs
63. Whole Milk Powder 3 kgs
64. Skin Milk Powder 3 kgs
65. Baking powder 100 gms

ADDRESS OF THE EQUIPMENT, GLASSWARE, CHEMICALS EQUIPMENT:

1. Vet India Pharmaceuticals, Hanuman Tekkadi, Opp. Pragathi Mahavidyalaya, Koti, Hyderabad (Surgical & Medical)
2. Andhra Chemicals, Begum Bazar, Hyderabad (Chemicals & Surgicals)
3. Metters International, anjali, 2nd floor, 144 St. Johns Church Road, Bangalore-560005. (A1 Equipment)
4. Bharath Heavy Plates & Vessels Ltd. BHPV Visakapatnam-530012 (AP) (LN2 Contininem)
5. High glass Chemical, Near Tourist Hotel, Kachiguda, Hyderabad
6. Hardware Engineers Works Pvt. Ltd. Meghji Compound 5-3-325, Mahatma Gandhi Road, Secunderabad-500003. (Mixer, Grinders, Chalfculter)
7. Sri venkateswara Engineering works, 3-10-44, Reddy Colony, Hanmakonda, Dist., Warangal-506001. AP. (Chalf Culter & Grinder, Mixer)
8. Rajasthan Electronics and instrument ltd. 2, Kanakpura, Industrial Area, Sivaji Road, Jaipur-302012
9. Gupta and Sons, Abids near GPO (For dairy Chemicals cream separators and other dairy equipment)
10. M.C. Dalal and Co. No. 12, Pillayar, Koil Street Madras-3
11. Delaval, Durgabai Deshmukh Colony, Hyderabad (Milking Machine and Dairy equipment)
12. Unicorn machinery manufacturers Ltd, 13/1 Rasulpura, Secunderabad-3. (Milking machine and other equipments)
13. Southern Chemicals, 504, Meridian apts, Lekehill Road, Hyderabad-463(chemicals, flavor, colours etc)
WEIGHTAGE OF MARKS FOR PRACTICALS

<table>
<thead>
<tr>
<th>Category</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ. Major Experiment</td>
<td>12</td>
</tr>
<tr>
<td>- Procedure of the experiment (with diagrams)</td>
<td>6</td>
</tr>
<tr>
<td>- Performing the experiment and result</td>
<td>6</td>
</tr>
<tr>
<td>IIQ. Minor Experiment</td>
<td>8</td>
</tr>
<tr>
<td>- Procedure</td>
<td>4</td>
</tr>
<tr>
<td>- Result/inference</td>
<td>4</td>
</tr>
<tr>
<td>IIIQ. Identification of the Spots</td>
<td>20</td>
</tr>
<tr>
<td>- Identification</td>
<td>½</td>
</tr>
<tr>
<td>- Characteristics</td>
<td>1</td>
</tr>
<tr>
<td>- Diagram</td>
<td>½</td>
</tr>
<tr>
<td>IVQ. Record and Viva Voice</td>
<td>10</td>
</tr>
<tr>
<td>- Record</td>
<td>5</td>
</tr>
<tr>
<td>- Viva Voice</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total Marks</strong></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>
VIII. (A) COLLABORATION INSTITUTIONS FOR CURRICULUM TRANSACTION

1. College of veterinary science, R. Nagar, Hyderabad-500030.
2. College of Veterinary Science, Tirupathi-517502.
3. NTR college of Veterinary Science, Gannavaram, Krishna District, Andhra Pradesh.
4. College of veterinary science Korutla, Karimnagar, Dist.
5. College of veterinary science Proddutur Cuddapa, Dist.
7. Dairy science college, Kamareddy, Nizamabad, Dist.
11. S.K. University, Anantapur, Andhra Pradesh-515003.
12. Department of Animal Husbandry. All Regional A-1 centres, polyclinics, veterinary hospitals etc.

(B) ON THE JOB TRAINING CENTRES

I. Dairy Farms:
   A. Ongole Cattle Farm, Lam, Guntur.
   B. Cattle Farm Bonavasi, Kurnool District.
   C. Dairy Experimental Station, College of Veterinary Science, Rajendranagar, Hyderabad.
   D. Dairy Farm College of Veterinary Science, Tirupati.
   E. S.V. Dairy Farm, Tirupati.
   F. Military Dairy Farm, Visakhapatnam.
   G. Indoswis Dairy Farm, Visakhapatnam.
   H. Ongole Cattle Breeding Farm, Ramatheertham, Prakasam district.
   I. Livestock Research Station, Chintaldeevi, Nellore District.

II. Veterinary Hospitals:
   Any veterinary Hospital/Veterinary Polyclinics, nearby college, hospital

III. Milk Plant:
   A. Milk Products Factory Lalapet, Hyderabad.
   B. Milk Dairy, Hayathnagar, Hyderabad.
   C. Milk Products Factory, Vijayawada.
   D. Milk Products Factory, Sangam Dairy, Vadlamudi, Guntur District.
   E. Milk Products Factory, Chittoor.
   F. Milk Products Factory, Rajahmundry.
   G. Milk Products Factory, Visakhapatnam.
   H. District Dairy at Nellore, Ongole, Warangal etc.
   I. Cream Line, Jersey Dairy products, IDA, Uppal, Hyderabad.
   J. Heritage Milk Foods, Chittoor District
   Any Milk Products Factory nearby
IV. Cooperative Society and Milk Collection Centre:
Any Village milk cooperative society nearby

V. Cattle Feed Factory
1. Feed Plant, Buddavaram, Krishna District.
2. Feed Plant Vadlamudi, Guntur District.
3. Feed Plant, Visakhapatnam.
4. Feed Plant S.V. Dairy Plant Tirupathi.
5. Feed Plant ANGRAU College of Veterinary Science, Rajendranagar, Hyderabad and Tirupathi.
6. Any feed plant organized by district cooperative milk union.

VI. Fodder Farms:
1. Fodder farm Banavasi Dairy Farm, Kurnool District.
2. Fodder seed multiplication farm, Reddipalli, Ananthapur.
3. Indoswiss Dairy Farm and Fodder Unit, Visakhapatnam.
4. Fodder farm College of Veterinary Science, Tirupathi.
5. Forage Research Centre College of Veterinary Science, R. Nagar, Hyderabad.
6. Any fodder farm organized by Government and Cooperative Milk Union.

IX. QUALIFICATION FOR LECTURERS

1. Vocational Lecturer (Full Time)
   Essential
   B.V.Sc. & AH/B.V.Sc/B.Sc. (Dairying)/B.Tech Dairy Tech/B.Tech (Dairying)/B.Sc (Dairy Technology)/B.Sc.(Dairying)/B.Sc.(animal science) with 55% marks.
   Desirable:
   B.V.Sc. & AH/B.V.Sc/B.Sc. (Dairying)/B.Tech (Dairy Tech)/B.Tech (Dairying)/B.Sc (Dairy Technology)/B.Sc.(Dairying)/B.Sc.(animal science) with 60% marks.
   M.V.Sc./M.Tech.(Dairying)/M.Sc.(Dairying) in any branch of dairying, animal husbandry and livestock production and management.
   Any Diploma Course of specialization after graduation.
   One/two years experience in teaching/research/extension/farm/dairy plant.

2. Laboratory Assistant:
   Essential:
   +2 Course with vocational course in dairying/Diploma in veterinary science with 60% marks.
   Desirable:
   1 or 2 years experience in dairy farms/dairy plant and other dairy related activities.
X. VERTICAL MOBILITY

A. With Bridge Course:
   ii. B.V.Sc. & A.H.
   iii. B.Tech. Dairy Technology
        (10% of the seats may be reserved for these who pur ed reserved for these EAMCET on merit basis in ANGRAU, R.Nagar, Hyderabad.
   iv. B.Sc. Biotechnology
   v. B.Sc. Microbiology
   vi. B.Sc. (BZD, ANC)

B. Without Bridge Course
   i. B.A
   ii. B.Com.
XII. REFERENCE BOOKS

5. Dairy India – year book 2004
7. Forage crops of India – T. R. Narayan & PM Dabadhao
10. Animal Nutrition & feeding practices – Rajan S.K.
11. Artificial insemination of Farm Animals – Perry J.Ed.
15. Dairy Cattle Principles, practice problems and profit – Bath Donald & others.
16. Dairy handbook – NDRI. Processing and production, KARNAL
17. Biology of lactation-Schmidt
20. Principles & practices of Dairy Farm Management – Jagdish Prasad
21. Textbook of clinical veterinary medicine – Amalendu Chakrabarti
23. Milk & Milk Products – NCERT
24. Milk & Milk Products – Eckles, comb and Massey
27. Practical Animal Husbandry – Miller & Raberton
29. Diseases of Cattle-blood, DC (ETAL) London
30. Indian Journal of Dairy science (periodical)
31. Dairy man (Periodical)
32. Indian journal of Animal science
33. Dairy microbiology-Yadav.
DAIRYING COURSE

MODEL QUESTION PAPERS

DAIRYING
MODEL QUESTION PAPER
1 YEAR THEORY
PAPER-I
DAIRY ANIMAL MANAGEMENT

Time: 3 Hours                      Max.marks:50

SECTION - A

Note: i) Answer all Questions.
   ii) Each question carries 2 marks       2x10=20

1. What is “TEASER BULL”? 
2. Name any Four Indian buffalo breeds. 
3. Define culling. 
4. What is conventional dairy barn? 
5. Define colostrums. 
6. What is wening of calf? 
7. Name the reproductive organs of Cow. 
8. What is Lactogenesis? 
9. What is pasteurization? 
10. What is De-horning?

SECTION – B

Note: i) Answer any 5 Questions
   ii) Each Question Carries 6 marks      5x6=30

11. What are the steps in clean milk production? 
12. What is A.I.? Write its advantages and disadvantages? 
13. What are the routine activities in dairy farm? 
14. Write about care and management of calf? 
15. What is the role of dairying in Indian economy? 
16. Describe the characteristic of “HOLSTEIN FRESIAN” breed. 
17. Briefly write about sanitation in a dairy farm shed? 
18. Write short notes on
   a) Milk let down
   b) Castration
DAIRYING COURSE

DAIRYING
MODEL QUESTION PAPER
I YEAR THEORY
PAPER-II
FEEDS OF FEEDING OF DAIRY ANIMALS

Time: 3 Hours        Max.marks:50

SECTION - A

Note: i) Answer all Questions.
ii) Each question carries 2 marks          2x10=20

1. Name the parts of small intestines.
2. Write two examples of leguminous fodder crops?
3. Define Ration.
4. What is calf starter?
5. Name any two feed ingredients?
6. Name two feed adulterants?
7. What is crop rotation?
8. Define chaffing of fodder.
9. What is vermin culture?
10. What is pellatization?

SECTION – B

Note: i) Answer any 5 Questions
ii) Each Question Carries 6 marks         5x6=30

11. What is the importance of feeding silage to dairy animals?
12. Write shortnotes on (a) Slvi Pasture (b) Horti pasture
13. What are the steps in efficient management of feed plant?
14. Write the Quality Control of finished feed?
15. Write the desirable characters of good rations?
16. Draw a neat sketch diagram of digestive system of cattle?
17. What are the feeding of standing of milch animals
18. Mention the method of silage making.
DAIRYING COURSE

DAIRYING
MODEL QUESTION PAPER
1 YEAR THEORY
PAPER-III
DAIRY ANIMAL HEALTH

Time: 3 Hours        Max.marks: 50

SECTION - A

Note: i) Answer all Questions.
   ii) Each question carries 2 marks     2x10=20

1. Define Health.
2. What is first aid?
3. Name any four bacterial diseases.
4. Name any four viral diseases.
5. Name any four protozan’s diseases.
6. What is De-worming?
7. Name two mycotic diseases?
8. What is Bloat?
9. What is “DYSTOCIA”?
10. Name two parasitic diseases?

SECTION – B

Note: i) Answer any 5 Questions
   ii) Each Question Carries 6 marks     5x6=30

11. Briefly describe about fractures?
12. Write short notes on (a) Black Quarter (b) Anthrax
13. Write about cowpox and Rabies diseases?
14. Describe any two protozoan diseases?
15. Write short notes on (a) Round worms (b) Liver flukes
16. What are the Infertility-causes and prevention methods?
17. Write about milk fever and ketosis diseases?
18. Write about infertility-causes and prevention.
DAIRYING
MODEL QUESTION PAPER
II YEAR THEORY
PAPER-I
QUALITY CONTROL OF MILK & PROCESSING

Time: 3 Hours Max.marks:50

SECTION - A

Note: i) Answer all Questions.
   ii) Each question carries 2 marks 2x10=20

1. Define Milk.
2. What are the normal pH acidity of milk?
3. What are the common adultrants in milks?
4. What are the microbial standards of Raw milks?
5. Expand MBRT & DMC.
6. Define Clarification.
7. Define HTST Pasturisation.
8. What are the objectives of packing?
10. What are the objectives of chilling of milks?

SECTION – B

Note: i) Answer any 5 Questions
   ii) Each Question Carries 6 marks 5x6=30

11. What are the common problems in Refrigeration system and write its remedies?
12. Write short notes on
   a) Detergents b) Sanitizers
13. Define Homogenization, what are the advantages and disadvantages?
14. What are the factors affecting efficiency of cream separator?
15. Write about milk transportation Methods.
16. How do you estimate microbes in milks?
17. What are the common preservatives in milk? Describe any two detection methods?
18. Describe the properties of steam.
DAIRYING COURSE

DAIRYING
MODEL QUESTION PAPER
II YEAR THEORY
PAPER-II
MILK PRODUCTS

Time: 3 Hours        Max.marks:50

SECTION - A

Note: i) Answer all Questions.
ii) Each question carries 2 marks     2x10=20

1. Define Recombined Milks.
2. Write the composition of cream.
3. What are the uses of butter?
4. What is Agmark grading?
5. What is over run in ice cream?
6. What is evaporated milks?
7. Name any four Indigenous milks products.
8. Name four dairy by products.
10. Name two channa based sweets.

SECTION – B

Note: i) Answer any 5 Questions
ii) Each Question Carries 6 marks    5x6=30

11. Write the procedure of cheddar cheese preparation?
14. Write about the methods of manufacturing process of whole milk powder by spray drying method?
15. Write short notes on a) Khoa   b) Paneer
17. What is the factors efficiency of cream separation?
18. Write the procedure of standardized milk preparation.
DAIRYING COURSE

DAIRYING
MODEL QUESTION PAPER
II YEAR THEORY
PAPER-III
DAIRY ECONOMICS EXTENSION & ENTERPRENEURSHIP

Time: 3 Hours        Max.marks:50

SECTION - A

Note: i) Answer all Questions.
   ii) Each question carries 2 marks     2x10 =20

1. Name two Dairy Development programmes?
2. What is milk shed area?
3. Define white revolution.
4. What are the aims of village milk co-operative system?
5. Define Sales man.
6. What is double entry system?
7. Name two dairy extension methods?
8. What is self employment?
9. What are the objectives of communication?
10. What is dairy animal insurance?

SECTION – B

Note: i) Answer any 5 Questions
   ii) Each Question Carries 6 marks   5x6=30

11. Describe the role of extension in Dairy Development?
12. Briefly write about Anand Patterns Co-operative system.
13. Write a project reports for 5000 lts. and 50,000 lts. Processing centers.
14. What are the system of milk collection and describe it?
15. What are the various dairy development programs available in India?
16. What are the records and registers maintained in a co-operative society?
17. Describe about preparation of Balance Sheet.
18. Describe the systems of milk pricing.
List of subject Committee Members

1. Dr. N. Krishnaiah, Professor,
   Dept. of Veterinary Public Health,
   College of Veterinary Science,
   Rajendranagar, Hyderabad.

2. Dr. P. Sundar Reddy
   Asst. Director,
   Dept. of Animal Husbandry,
   Seetarambagh, Hyderabad.

3. Sri K. Vishweshwar
   Junior Lecturer in Dairying,
   Govt. City Junior College,
   Hyderabad.

4. B. GNANA SAGAR,
   Professor [FAC] S.I.V.E.& Deputy Director,
   O/o the Commissioner of Intermediate Education,
   Andhra Pradesh,
   Hyderabad