Scheme of Practical Examination

Animal Husbandry and Dairy Technology (MA, MB, MC)

Paper - I - (MA) Dairy Production and Management
Paper - II- (MB) Milk Processing
Paper - III - (MC) Milk Products

General information about practical examination.

1. The practical examination and evaluation scheme of each subject (Paper I, II, III) is given below.

Total marks Allotted for Practical evaluation	Marks for Practical examination	Term Work	Project Work	O J T	Educational visits
120	80	10	10	10	10

2. The batch for practical examination will be of 20 students
3. Duration of the practical examination for each subject (Paper I, II & III) will be of three hours.
4. The examiners may form small groups of students for conducting practicals as per requirement.

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Animal Husbandry and Dairy Technology (MA, MB, MC)

Instructions to the Head of Institution

1. Practical examination will be conducted strictly as per the programme / instructions sent by the Board.
2. The detailed programme of practical examination including Time Table, batches of student, journal etc. must be kept ready as per Board instructions.
3. The students should be informed to bring scale, pencil, practical journal etc.
4. It will be entire responsibility of the Head of the institution to see that all the preliminary formalities and necessary arrangements for the examination are completed well in advance in consultation with the concerned internal examiner to secure smooth conduct of examination.
5. The list of materials / Equipments required for practical examination is given in the scheme of practical examination.
6. In case the external examiner appointed by HSC Board fails to attend the examination then the Head of Institution should appoint the examiner from nearby institute and if no examiner is available, then a Teacher from the institute who is in touch with the subject be appointed.
7. External examiner should submit the entire examination report to the board office immediately after the completion of examination. This report should be confidential and must contain the experimental changes if any, co-operation from internal examiners, students & Head of Institution.

Scheme of Practical Examination
Animal Husbandry and Dairy Technology (**MA, MB, MC**)

Instructions to the Examiners

1. Internal examiners should make all the necessary arrangements for smooth conduct of practical examination.
2. The External examiner should inspect all the arrangements one day prior to the actual date of examinations.
3. The External examiner and Internal examiner should jointly prepare the question paper according to the scheme of examination provided by HSC Board.
4. Both the examiners should jointly assess the excercise performed by the student.
5. Both the examiners should jointly assess the term work, project work, OJT & educational visits records and journals.
6. The examiners should fill the mark sheets and related records accordingly.
7. Duly signed mark sheets and other examination records in sealed envelopes should be handed over to the Head of the Institution immediately.

Instructions to the Candidates

1. Students appearing for examination should be present half an hour before commencement of examination and report themselves to the Internal Examiner.
2. They should have pen, pencil, journal, scale etc.
3. They should write on the answer book only which is supplied by HSC Board.
4. They should ascertain whether they have completed all items before leaving the place of examination.
5. Every student is expected to complete the journal in all respects and get certified from the Head of Institute.
6. Students should present their term work, project work and visit report at the time of practical examination.

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Paper - III - (MC) Milk Products

Nature of the questions, Scheme of marking and Time allotment

Q.No	Nature of questions	Marks	Time(Minutes)
1	**Identification / Spotting** Give ten spots, each spot 02 marks 1 mark for identification & 1 mark for answer of each spot question The question at each spot should be such that it can be answered in one or two words or numbers or in one sentence.	**20**	20
2	**Procedure writing (Any one)** The students should be asked to write material required and procedure of the experiment	**10**	20
3	**Experiment (Any one)** -One experiment should be given in a group of maximum five students. - The students are expected to write the complete procedure of given experiment, record relevant observations & conclusion. - The examiner should observe skill & correctness of students while he/she performs an experiment. <u>Scheme of marking</u> a) Writing of procedure b) Observations c) Result / Conclusion d) Skill & Correctness	**35** (05) (10) (10) (10)	120
4.	**Viva - voce** Ask minimum five questions related to syllabus. It should be conducted during conduct of experiment.	05	10
5.	**Practical Journal**. Neatness, cleanliness, regularity, remarks & signature of instructor, Head of Institution should be considered	10	10
	Total	**80**	**180**

Scheme of Practical Examination

Animal Husbandry and Dairy Technology (MA, MB, MC)

Paper - I - (MA) Dairy Production and Management

List of material / Equipments / Instruments / Chemicals

1. Hot and cold branding sets.
2. Ear tags (metal and plastic)
3. Tatooing set
4. Dehorning saw
5. Electric dehorner
6. Spray pump
7. Bull holder
8. Bull nose punch
9. Bull nose ring
10. Hoof trimmer
11. Curry comb
12. Body brush
13. Feeding pail
14. Burdizzo castrator
15. Clinical Thermometer
16. Compound microscope
17. Drenching bottle
18. Feeding cup
19. Enema pot
20. Irrigator
21. Infusion set (I.V. Set)
22. Spirit Lamp
23. Syringe
24. Trocar and canula
25. Pestle and mortar
26. Milk Siphon
27. Scalpel
28. Scissor
29. Artery forceps
30. Tissue forceps
31. Automatic vaccinator
32. Plastic paddle
33. Strip cup
34. Gerber Machine
35. Milk Butyrometer
36. Milk Butyrometer Stand
37. Milk Pipette (10.75 ml)
38. Automatic tilt measure
39. Amyl alcohol
40. Sulphuric acid
41. Urea
42. Skim milk powder
43. Formaldehyde
44. Boric acid
45. Salicylic acid
46. Lactometer
47. Milk plunger
48. Dipper
49. Sampling bottle
50. Lock stopper
51. Lock stopper key

Note: Other essential material / equipments / Chemicals / instruments as per requirement for the practical

Scheme of Practical Examination

Animal Husbandry and Dairy Technology (MA, MB, MC)

Paper - I - (MA) Dairy Production and Management

Key for Practical Examination (English version)

Q. No. 1 Identification / Spotting (Any ten)

Marks 20

1) Milk Plunger
2) Lactometer
3) Milk sampling dipper
4) Urea
5) Skim milk powder
6) Sampling bottle
7) Lock stopper
8) Lock stopper key
9) Milk butyrometer
10) Milk pipette
11) Automatic tilt measure (1ml & 10 ml)
12) Strip cup
13) Plastic paddle
14) Milk siphon
15) Ear tags
16) Burdizzo castrator
17) Drenching bottle
18) Enema pot
19) Infusion set
20) Syringe
21) Trocar & canula
22) Scalpel
23) Scissor
24) Lactometer jar
25) Milk measurement
26) Pipette (1ml, 5 ml, 10 ml)
27) Test tube holder
28) Spirit lamp
29) Milk Butyrometer
30) Milk butyrometer stand
31) Test tube stand
32) Tatooing ink
33) P. P. indicator
34) Litmus paper

Q. No. 2 Procedure writing (Any one) **Marks 10**

1. a) Write the objectives of housing for Dairy animals. 04
   b) State points to be considered while selection of site for construction of Dairy farm. 06
2. a) Enlist the material required for tattooing 04
   b) Write the procedure / Technique of Tattooing 06
3. a) Enlist the material required for Ear tagging 04
   b) Write the procedure / Technique of Ear tagging for Dairy animals. 06
4. a) Enlist the materials required for chemical branding 04
   b) Write the procedure / Technique of chemical branding 06
5. a) Enlist the material required for castration of bulls. 04
   b) Write the procedure / Technique of castration of bulls by Burdizzo castrator 06
6. a) Compare Hand milking with machine milking of milch animals. 04
   b) Write the technique of machine milking. 06
7. Give the standard formats for following Dairy farm records / Register (Any two) 10
   a) Livestock Register
   b) Calf Register
   c) Milk Record
   d) History Sheets

8. Give the standard formats for following Dairy farm records / Register (Any two) 10
   a) Calving Register
   b) Feed and Fodder Register
   c) Cattle breeding Register
   d) Herd Health Register
9. Enlist any five commonly used drugs in animal treatment with their uses. 10
10. Enlist any five commonly used instruments for animal treatment with their uses. 10
11. Write names of any ten glass-wares used in dairy laboratory along with their uses. 10
12. a) Enlist the material required for determination of formaldehyde as a preservative in milk. 04
    b) Write the procedure for determination of formaldehyde as a preservative in milk. 06
13. a) Enlist the material required for determination of Boric acid as a preservative in milk. 04
    b) Write the procedure for determination of Boric acid as a preservative in milk. 06
14. a) Enlist the material required for determination of Salicylic acid as a preservative in milk 04
    b) Write the procedure for determination of Salicylic acid as a preservative in milk. 06
15. Write the various equipments used for sampling of milk from milk cans & tankers and write the procedure of sampling. 10
16. Write the various equipments used for sampling of milk from milk storage tanks and write the procedure of sampling. 10
17. Write the functions / objectives of Dairy Co-operative Society. 10
18. Write the factors affecting viability of Dairy Co-operative Society. 10
19. Write the Role of Dairy Co-operative Society in enhancing social welfare of village development. 10
20. Write the various routine management practices on a dairy farm. 10

Q. No. 3 Experiment (Any one) **Marks 35**

In a group of maximum five students.

1. Sketch Tail to Tail system of housing of Dairy animals with dimensions for 10/20/50 cows/Buffaloes.

2. Sketch Head to Head system of housing of Dairy animals with dimensions for 10/20/50 cows/Buffaloes.
3. Prepare a layout / Plan of Loose housing system for 50/100 cows / Buffaloes.
4. Recording of Body temperature & Respiration Rate in cattle / Buffaloes.
5. Perform milking of given Cow / Buffalo by stripping & full hand method.
6. Disbudding of calf by chemical method.
7. Calculation of Body weight of any two animals by using Shafer's formula.
8. Determination of age of given animal by dentition method.
9. Determination of milk fat by Gerber method
10. Determination of Titratable acidity percentage in milk.
11. Determination of milk adulterants- Water & Sugar
12. Determination of milk adulterants- Urea & Skim milk powder.
13. Preparation of milk slides for bacteriological examination.

14. Calculate milk producer's milk bill for ten days morning/evening on the basis of following data.

Given: 1) Rate of milk Rs. _____ /kg of milk fat for cow / buffalo milk.

2) Milk rate chart procured from Dairy Co-operative Society

Name of milk producer: Shri/Shrimati _____

Sr. No.	Date	A-Cow Milk (morning/evening)				B- Buffalo milk (morning/evening)			
		Qty. Kg/ Ltr	Fat %	Rate Rs.	Total Rs.	Qty. Kg/ Ltr	Fat %	Rate Rs.	Total Rs.
1 to 10									

Q. No. 4 Viva voce **Marks 05**

Q. No. 5 Journal **Marks 10**

Scheme of Practical Examination

Animal Husbandry and Dairy Technology (**MA, MB, MC**)

Paper - II - (MB) Milk Processing

List of Material / Equipments

1. Equal T
2. Reducer T
3. Bends
4. U bend with flange
5. Nipples
6. Eccentric reducers
7. Elbows
8. Socket
9. Union
10. Valves
11. Pumps
12. Different pressure gauze
13. Different thermometers
14. Shell & Tube
15. Essence
16. Food colours
17. Chocolate powder
18. Butter oil
19. Whole milk powder
20. Skim milk powder
21. Crates
22. Autoclave
23. Electronic milk tester

Scheme of Practical Examination

Animal Husbandry and Dairy Technology (**MA, MB, MC**)

Paper - II - (MB) Milk Processing

Key for practical examination (English version)

Q. No. 1 Identification / spotting (Any ten) **20 marks**

1. Reduced T
2. Bends
3. Equal T
4. Nipples
5. Ecentric reducer
6. Elbows
7. Socket
8. Union
9. Valves
10. Pumps
11. Different pressure gauze
12. Different Thermometers
13. Shell & Tube
14. Essence
15. Food colours
16. Chocolate powder
17. Butter oil
18. Whole milk powder
19. Skim milk powder
20. Autoclave
21. Milk measuring devices

Q. No. 2 Procedure writing (Any one) **10 marks**

1. a) Enlist the different heat measuring devices 04
   b) Write the procedure for measuring heat 06
2. a) Enlist the different pressure measuring devices 04
   b) Write the procedure for measuring pressure 06
3. a) Sketch and label the parts of can scrubber 04
   b) Write the procedure for washing cans /lids by can scrubber 06
4. a) Sketch straight through can washer & label the various parts 04
   b) Explain the operational procedure of straight through can washer 06
5. a) Sketch crate washer & label the various parts 04
   b) Explain the operational procedure of crate washer 06
6. a) Sketch homogenizer and label the parts 04
   b) Explain the operation of homogenizer 06
7. a) Sketch & label the H.T.S.T. pasteurizer 04
   b) Write about care & maintenance of H.T.S.T. pasteurizer 06
8. a) Sketch & label the various parts of vertical boiler 04
   b) Write about operational procedure of vertical boiler 06
9. a) Sketch and label various parts of Electronic Milko-Tester. 04
   b) Write the operational procedure for fat determination in milk by Electronic Milko-Tester 06
10. Solve any two problems on standardization of milk. 10

Q. No. 3. Experiment (Any one) **35 marks**

1. Preparation of Toned milk
2. Preparation of double Toned milk
3. Preparation of Recombined milk
4. Preparation of Reconstituted milk
5. Preparation of Chocolate milk
6. Preparation of fruit flavoured milk
7. Preparation of sterilized flavoured milk
8. Preparation of pasteurized milk
9. Preparation of Detergent solution for can & crate washer

Q. No. 4 Viva voce **05 marks**

Q. No. 5 Journal **10 marks**

Scheme of Practical Examination

Animal Husbandry and Dairy Technology (MA, MB, MC)

Paper - III - (MC) Milk Products

List of Material /Equipments / Instruments

1. Wooden butter churn
2. Mixer
3. Blender
4. Butter worker, scoops, knife, hammer, scotch hand, butter printer
5. Gas burner
6. Ice cream freezer (hand operated)
7. Ice cream cup (Glass/paper)
8. Ice cream cutter
9. Incubator
10. Karahi (Iron & non sticky)
11. Oven
12. Refrigerator
13. Cream butyrometer
14. Butter butyrometer
15. Paneer press
16. Muslin cloth
17. Hanging stand for chakka
18. Kulfi moulds
19. Thermocol box
20. Ravi (wooden/steel)
21. Packaging material
22. Cow milk
23. Buffalo milk
24. Cream
25. Custard apple
26. Anjir
27. Basmati Rice
28. Sugar
29. Table butter
30. Desi butter
31. Butter milk
32. Starter culture
33. Lactic acid
34. Citric acid
35. Baking powder
36. Maida
37. Ghee
38. Ice
39. Dalda
40. Stabilizer
41. Emulsifier
42. Food colour
43. Different fruits
44. Different Nuts
45. Sodium alginate
46. Coconut
47. Cream / Ripened cream
48. Butter paper
49. Lid of wooden butter churn

Scheme of Practical Examination

Animal Husbandry and Dairy Technology (MA, MB, MC)

Paper - III - (MC) Milk Products

Q. No. 1 Identification / Spotting (Any ten) **20 marks**

1. Wooden butter churn
2. Mixer
3. Blender
4. Butter worker
5. Butter printer
6. Butter knife
7. Ice cream freezer (Hand operated)
8. Ice cream cutter
9. Karahi
10. Oven
11. Paneer press
12. Muslin cloth
13. Kulfi moulds
14. Butter Butyrometer
15. Cream Butyrometer
16. Custard apple
17. Sugar
18. Table butter
19. Desi butter
20. Starter culture
21. Citric acid
22. Ghee
23. Dalda
24. Food colour
25. Baking powder
26. Cream
27. Cow milk
28. Buffalo milk
29. Paneer
30. Ice cream pot
31. Maida
32. Scotch hands

Q. No. 2. Procedure writing (Any one) **10 marks**

1. a) Enlist the material required for preparation of Basundi (Plain / Anjir /Custard apple)	04
b) Write the procedure of Basundi preparation.	06
2. a) Enlist the material required for preparation of Khurchan	04
b) Write the procedure of Khurchan preparation.	06
3. a) Enlist the material required for preparation of Rabri / Rabdi	04
b) Write the procedure of Rabri / Rabdi preparation	06
4. a) Enlist the material required for Pedha preparation	04
b) Write the procedure of Pedha preparation	06
5. a) Enlist the material required for Burfi preparation	04
b) Write the procedure of Burfi preparation	06
6. a) Enlist the material required for Kalakand preparation	04
b) Write the procedure of Kalakand preparation	06
7. a) Enlist the material required for Rassogolla	04
b) Write the procedure of Rassogolla	06
8. a) Enlist the material required for Rasmalai preparation	04
b) Write the procedure of Rasmalai preparation	06
9. Enlist the various parts of cream separator & write their functions	10
10. a) Enlist the material required for Kulfi/Milk candy/Pepsi preparation	04
b) Write the procedure of Kulfi/Milk candy/Pepsi preparation	06
11. a) Sketch of wooden butter churn with different labelled parts	04
b) Write care & maintenance of wooden butter churn	06
12. Write the method for detection of maida / soda as adulterants in khoa	10
13. Write the procedure for detection of vanspati / refined vegetable oil in ghee.	10

Q. No. 3 Experiment (Any one) **35 marks**

1. Preparation of Khoa from cow milk.
2. Preparation of Khoa from Buffalo milk.
3. Preparation of Gulabjamun.
4. Preparation of Shrikhand.
5. Preparation of Channa.
6. Preparation of Lassi.
7. Preparation of Paneer.
8. Separation of cream by Centrifugal cream separator.
9. Preparation of Table butter.
10. Preparation of Desi butter
11. Salting and working of Butter.
12. Preparation of Ghee from Desi butter
13. Preparation of Ghee from creamery butter.
14. Solve the problem. 15

    Calculate the quantities of ingredients required for preparing 100 Kg. Ice cream mix containing 10 % milk fat, 11% SNF, 14.5% Sugar & 0.5% stabilizer.

Given:

Sr No	Ingredients	Fat %	SNF%
1	Whole Milk	6.0	9.0
2	Cream	40.0	6.0
3	Skim Milk powder	----	95.0

Using the above information prepare 1 Kg. of good quality Plain ice cream /Fruit ice cream / Nut ice cream 20

Note: The above problem is an example. You can use different data for solving problem in preparing ice-cream mix

15. Determination of fat in cream.
16. Determination of acidity in cream.

Q. No. 4 Viva voce **05 marks**

Q. No. 5 Journal **10 marks**

Animal Husbandry and Dairy Technology (**MA, MB, MC**)

(Guidelines for Assessing Term work, OJT, Project work, Educational visit)

Term Work — Marks 10

Points to be considered for Term Work
Attendance of students
Performance in regular practicals
Performance in internal tests & tutorials

O J T (On the Job Training) — Marks 10

- Organise the OJT programme according to information made available from DVETO
- Observe OJT record accordingly.
- Marks should be given by considering reports of concerned institute & record maintained by the student.

Project Work — Marks 10

- Observe the copy of project report
- Observe the project work done by the student
- Assess the project for skill & weakness
- Find whether the project work is useful for the student's development in future

Educational Visits (E. V.) — Marks 10

- Attendance of students for visits
- Educational visit report