

Gilligan Veterinary & Animal Sciences University
Department of Dairy & Poultry Sciences
M.S. in Dairy Science
July - December Semester, 2016
Sub: Microbiology of Milk and Milk Products
Course Code: MMP 602

Total marks: 40
Time: 2 hrs

Answer any five questions. Figures in the right margin indicate full marks. Split answers are discouraged.

- 1(a). State recent development in the field of Dairy Microbiology 3.0
- (b) State the important families that are important in dairy microbiology ~~with~~ showing the reasons. 5.0
- 2.(a) State the concept of Dairy starters. What are their types? 3.0
- (b) Sketch the sequential analytical steps in preparing mother culture for lactic fermentation. 5.0
- 3 (a) State the common cultures used for manufacturing cheese, cultured buttermilk, cultured cream and acidophilus milk. 3.0
- (b) Write down the cultural characteristics for ~~the~~ flavor culture along with the development of flavor in yogurt. 5.0
- 4(a) State the concept of "Recombination in Bacteria". 3.0
- (b) Write a note on "Transformation". 5.0
- 5(a) What are common microorganisms that are found in milk?
- (b) State the techniques of identification of coliform bacteria in milk.
- 6(a) Name common gas forming bacteria in milk and milk products. State their significance in milk.
- (b) State the common precautions for preventing market milk from their ~~in~~ contaminations.
7. Write short notes (any three including 'a') $3.0 + 2.5 \times 2 = 8.0$
 - (a) Lactic streptococci
 - (b) Genomics of Bacteriophage
 - (c) Common microbial defects in yogurt
 - (d) Microbiology of Butter
 - (e) Yeast fermentation
 - (f) Spore formers

Chittagong Veterinary & Animal Sciences University

Department of Dairy & Poultry Sciences

MS in Dairy Science

July-December Semester, 2016

Sub: Research Methodology

Course Code: RMD 602

Total Marks: 40

Time: 2 hrs.

x

Answer any 5 (five) questions. Figures in the right margin indicate full marks. Split answers are discouraged.

1(a) State the concept of Research Methodology. 3.0

(b) State common motivations in "Research" and important "ethics in research". 5.0

2(a) Show the sequential steps in biological research. 3.0

(b) Write a note on "Review of Literature". 5.0

3(a) Write a note on "Research Design". 3.0

(b) State the formal experimental designs. What are the common features of Randomized Block Design? 5.0

4(a) Explain the meaning of Analysis of Variance. 3.0

(b) Briefly present the techniques of Analysis of Variance for two way classification. 5.0

5(a) State the concepts of "Hypothesis" and "Testing of Hypothesis". 3.0

(b) The specimen copperwire drawn from a large lot have the following breaking strength (kg):

578, 572, 570, 568, 572, 578, 570, 572, 596, 544

Test (using Student's t-statistic) whether the mean breaking strength of the lot may be taken to be 578 kg weight (Test at 5 percent level of significance). [Table value: 2.62] 5.0

6(a) State the concept of "data". 3.0

(b) State the sequential steps in data analysis. 5.0

7. Write short notes (any 3 including 'a' as compulsory) $3.0 + 2.5 \times 2 = 8.0$

(a) Chi-square test

(b) Research proposal

(c) Sample designs

(d) Interpretation in Report Writing

(e) Parametric tests

Chittagong Veterinary and Animal Sciences University

MS in Dairy Science Final Examination/2016

Dept. of Dairy and Poultry Science

July-December Semester/2016

Course: Advanced Dairy Cattle Production

Course Code: DCP-602;

Total Marks: 40; Time: 2 hours

Answer any four questions from the following.

1. a) Write the principles of all dairy production system. 02
b) What are the basic components of all dairy production system? 03
c) Discuss the present scenario of dairy sector of Bangladesh. 05
2. a) Give a comparison between organic and conventional dairy farming. 05
b) Explain the scenario of organic dairy farming in Bangladesh. 05
3. a) Milk marketing time in 'Bondhan Dairy Farm (100 cow herd)' is 10 am & 6.30 pm in 05
Summer season – you as a dairy expert prepare a daily routine activities schedule for that farm.
b) If, Bangladesh Government decides that milk price will be given on the basis of cost of 05
production & make you responsible for fixing the milk price- how will you proceed?
4. a) The main objectives of record keeping in a dairy farm are i) to know the quality of 05
management i) to ensure the proper care and management to the herd & i) to know
the profit or loss. Can you format & analyse at least one register against each of the
objectives putting relevant data/information?
b) You three classmates have decided to establish a dairy farm of 200 cow herd within three 05
years after completing your MS in Dairy Science from CVASU. Would you please explain
the collection plan of initial stocks for your dairy farm?
5. a) How can you achieve one calf from one cow each year in your dairy farm? 05
b) Explain the impact of pregnancy on lactation persistency. 05

Chittagong Veterinary and Animal Sciences University

MS in Dairy Science Final Examination/2016

Dept. of Dairy and Poultry Science

July-December Semester/2016

Course: Dairy Farm Planning and Management

Course Code: FMP-602;

Total Marks: 40; Time: 2 hours

You are a recent graduate of Chittagong Veterinary and Animal Sciences University working in a Livestock Consulting organization as a Dairy Expert. Last Friday an entrepreneur has come to your desk and given you a big task for preparing a project proposal of 250 cow dairy herd aiming to get loan around 7core taka from Bangladesh Krishi Bank. The client has provided you the following information:

Name & Address of the entrepreneur: Md. Zahidul Islam, Father Name: Md. Shahidul Islam, Wajia Madrasa, Ward no.3, Panchlish, Chittagong; Location of the farm: Shikalbaha, Potia, Chittagong; Duration of Loan: 5 years; Grace period: 6 months; Bank interest rate: 9%; Fodder cultivation & transportation: Mechanized, Market value of land: TK30 lacs /acre; Type of equity: 10 acres land + Land development & fencing cost + Preliminary farm management cost + Cost of pre-production phase + Inflation & contingency; Moreover, assume that market price of dairy cow=37500000/=; Civil construction cost: 23000000/=; Equipments & machineries cost: 7800000/=, Land development & fencing cost=500000; Preliminary farm management cost=2750000/=; Cost of pre-production phase: 200000/=; Inflation & contingency: 3428750/=

Calculated amount of loan from Bangladesh Krishi Bank= 6,830000/=; Interest during grace period= 30,73,500. The following table explains the repayment schedule of bank loan.

MONTHS	EMI	INTEREST	PRINCIPAL REPAYMENT	OST PRINCIPAL
0				71373500
1	1,612,283	535301	1076982	70296518
2	1,612,283	527224	1085059	69211460
3	1,612,283	519086	1093197	68118263
4	1,612,283	510887	1101396	67016867
5	1,612,283	502627	1109656	65907211
6	1,612,283	494304	1117979	64789232
7	1,612,283	485919	1126364	63662868
8	1,612,283	477472	1134811	62528057
9	1,612,283	468960	1143322	61384735
10	1,612,283	460386	1151897	60232838
11	1,612,283	451746	1160537	59072301
12	1,612,283	443042	1169241	57903060
13	1,612,283	434273	1178010	56725051
14	1,612,283	425438	1186845	55538206
15	1,612,283	416537	1195746	54342460
16	1,612,283	407568	1204714	53137745

17	1,612,283	398533	1213750	51923995
18	1,612,283	389430	1222853	50701143
19	1,612,283	380259	1232024	49469118
20	1,612,283	371018	1241264	48227854
21	1,612,283	361709	1250574	46977280
22	1,612,283	352330	1259953	45717327
23	1,612,283	342880	1269403	44447924
24	1,612,283	333359	1278923	43169001
25	1,612,283	323768	1288515	41880486
26	1,612,283	314104	1298179	40582306
27	1,612,283	304367	1307915	39274391
28	1,612,283	294558	1317725	37956666
29	1,612,283	284675	1327608	36629058
30	1,612,283	274718	1337565	35291493
31	1,612,283	264686	1347597	33943897
32	1,612,283	254579	1357704	32586193
33	1,612,283	244396	1367886	31218307
34	1,612,283	234137	1378145	29840161
35	1,612,283	223801	1388482	28451680
36	1,612,283	213388	1398895	27052785
37	1,612,283	202896	1409387	25643398
38	1,612,283	192325	1419957	24223441
39	1,612,283	181676	1430607	22792834
40	1,612,283	170946	1441337	21351497
41	1,612,283	160136	1452147	19899350
42	1,612,283	149245	1463038	18436313
43	1,612,283	138272	1474010	16962302
44	1,612,283	127217	1485066	15477237
45	1,612,283	116079	1496204	13981033
46	1,612,283	104858	1507425	12473608
47	1,612,283	93552	1518731	10954878
48	1,612,283	82162	1530121	9424756
49	1,612,283	70686	1541597	7883159
50	1,612,283	59124	1553159	6330000
51	1,612,283	47475	1564808	4765192
52	1,612,283	35739	1576544	3188649
53	1,612,283	23915	1588368	1600281
54	1,612,283	12002	1600281	0

Answer the following questions on the basis of above mentioned scenario.

1. Mention the progress of herd size from commencement to 4th year of farming. 5.0
2. Calculate the equity and loan ratio for the proposed project. 5.0
3. Calculate the projected recurring costs during bank loan period. 10.0
4. Forecast the income during bank loan period. 5.0
5. Prepare a statement of yearly expenditure during loan period. 5.0
6. Estimate the yearly income of the farm. 5.0
7. Write the project summery. 5.0

X

Chittagong Veterinary and Animal Sciences University
Department of Dairy and Poultry Science
MS in Dairy Science
(July-December semester) Final Examination- 2016
Subject: Advanced Dairy Cattle Breeding; Course Code: ADB-602
Full marks: 40; Time: 2 hours

Answer any four questions from the following. Figure in the right margin indicate full marks.

1. a) What do you mean by population and effective population size? 3.0
b) How you will design a breeding program for dairy cattle breeding of Bangladesh. 7.0
2. a) What is heritability? Discuss briefly about the heritability estimation of a dairy trait. 5.0
b) Why repeatability is very important for dairy cow selection? Explain with example. 5.0
3. a) Why selection index is the best method for selection dairy cattle? Develop selection index for selecting breeding bull. 5.0
b) Briefly describe about selection method and selection criteria. 5.0
4. a) Write a short note about genetic gain. How you will estimate genetic gain for milk yield of cow? 5.0
b) What do you mean by species hybridization? Explain with example. 5.0
5. a) Differentiate cross-breeding from up-grading. How you will develop our indigenous cattle for high milk yield? 5.0
b) What is the breeding policy of dairy cattle breeding in Bangladesh? 5.0

X

Chittagong Veterinary and Animal Sciences University
Department of Dairy and Poultry Science
M S July – December Semester Final Examination – 2016
MS in Dairy Science
Course title: Market Milk Production and Processing (theory)
Course Code: MPP – 602(T)

Time: 2 hours

Total marks: 40

Answer any four (4) of the following questions. Each question carries equal marks. 4X10=40

1. a) Tabulate the vitamin and mineral contents of market milk in detail. 5
b) Sketch the layout of a pilot milk processing plant. 5
2. a) How do you suggest for producing TB organism free market milk in context of Bangladesh? 4
b) Briefly describe the collection and buying methods of raw milk in Bangladesh. 4
c) Describe the method of automatic standardization of milk. 2
3. a) Briefly describe the procedure of CIP in a HTST milk pasteurization plant. 4
b) Briefly describe the HTST pasteurization system in a neat diagram. 6
4. a) State the microbiological standards of market milk. What do you mean by grade A milk? How can you produce grade A milk? 6
b) Diagrammatically show the marketing channel of Market milk in Bangladesh. 4
5. a) State the factors related to farms and plants that affect the composition of market milk? 2
b) Make a list of necessities for establishing a milk chilling plant. 3
c) Describe the Bulk tank method of chilling of milk. 5

Chittagong Veterinary and Animal Sciences University
Dept. of Dairy and Poultry Science
MS in Poultry Science Final Examination 2016
Semester: July-December, 2016
Course Title: Poultry Behavior and Welfare (PBW-602)
Total marks- 40; Time: 2 Hours

Answer any five questions of the following wherein question no. 1 is compulsory; Figures in the right margin indicate full marks.

1. a) What is Poultry Welfare? Describe the welfare concerns of egg producing chicken in Bangladesh. 4
b) Enlist the practical tips for avoiding welfare problems of broiler in Bangladesh. 4
2. What are the principles of Poultry welfare? Describe about poultry mutilation, breeding and raising environment on welfare aspect. 8
3. Enumerate the alternative husbandry systems that will enhance welfare and production performance of hen. 8
4. a) Define poultry behavior? State the factors governing behavioral responses of poultry. 4
b) What are Altrical and Precocial birds? Differentiate between behavior of free ranging wild fowl and domesticated chicken. 4
5. a) What are behavioral needs? Show the interaction of genome and environment which control the behavior of bird. 4
b) What is migration? State the nesting; roosting and perching behavior of free ranging chicken. 4
6. Short Notes (any two): 4 × 2 8
Enriched cages, Aviary and Perchery systems, Modification of Behavior, Welfare assesment

MS in Poultry Science
Department of Dairy and Poultry Science
Chittagong Veterinary and Animal Sciences University
Final examination 2016,
Session: July-December
Course: **Parent stock and Commercial broiler management**
(Answer any four. All questions are of equal marks)

Full marks: 40

Time: 2 hours

Questions:

1. Write names of litter materials in poultry farm. Describe litter management in breeder farm.
2. Mention different systems of ventilation and give it's importance. How would you ensure proper ventilation in commercial broiler house?
3. Write in detail of the bio-security measures in broiler farm.
4. Give a brief description on brooding and rearing management of broiler.
5. Write feeding regimes of commercial and breeder broiler.

Chittagong Veterinary and Animal Sciences University
Dept. of Dairy and Poultry Science
MS in Poultry Science Final Examination 2016
Semester: July-December, 2016
Course Title: Poultry Behavior and Welfare (PBW-602)
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6. Short Notes (any two): 4 × 2 8
Enriched cages, Aviary and Perchery systems, Modification of Behavior, Welfare assesment

A-1. DISCOUNT FACTOR—How much 1 at a future date is worth today.

Year	1%	3%	5%	6%	8%	10%	12%	14%	15%	16%	18%	20%	22%	24%	25%	26%	28%	30%	35%	40%	45%	50%
1	0.990	0.971	0.952	0.943	0.926	0.909	0.893	0.877	0.870	0.862	0.847	0.833	0.820	0.806	0.800	0.794	0.781	0.769	0.741	0.714	0.690	0.667
2	0.980	0.943	0.907	0.890	0.857	0.826	0.797	0.769	0.756	0.743	0.718	0.694	0.672	0.650	0.640	0.630	0.610	0.592	0.549	0.510	0.476	0.444
3	0.971	0.915	0.864	0.840	0.794	0.751	0.712	0.675	0.658	0.641	0.609	0.579	0.551	0.524	0.512	0.500	0.477	0.455	0.406	0.364	0.328	0.296
4	0.961	0.888	0.823	0.792	0.735	0.683	0.636	0.592	0.572	0.552	0.516	0.482	0.451	0.423	0.410	0.397	0.373	0.350	0.301	0.260	0.226	0.198
5	0.951	0.863	0.784	0.747	0.681	0.621	0.567	0.519	0.497	0.476	0.437	0.402	0.370	0.341	0.328	0.315	0.291	0.269	0.223	0.186	0.156	0.132
6	0.942	0.837	0.746	0.705	0.630	0.564	0.507	0.456	0.432	0.410	0.370	0.335	0.303	0.275	0.262	0.250	0.227	0.207	0.165	0.133	0.108	0.088
7	0.933	0.813	0.711	0.665	0.583	0.513	0.452	0.400	0.376	0.354	0.314	0.279	0.249	0.222	0.210	0.198	0.178	0.159	0.122	0.095	0.074	0.059
8	0.923	0.789	0.677	0.627	0.540	0.467	0.404	0.351	0.327	0.305	0.266	0.233	0.204	0.179	0.168	0.157	0.139	0.123	0.091	0.068	0.051	0.039
9	0.914	0.766	0.645	0.592	0.500	0.424	0.361	0.308	0.284	0.263	0.225	0.194	0.167	0.144	0.134	0.125	0.108	0.094	0.067	0.048	0.035	0.026
10	0.905	0.744	0.614	0.558	0.463	0.386	0.322	0.270	0.247	0.227	0.191	0.162	0.137	0.116	0.107	0.099	0.085	0.073	0.050	0.035	0.024	0.017
11	0.896	0.722	0.585	0.527	0.429	0.350	0.287	0.237	0.215	0.195	0.162	0.135	0.112	0.094	0.086	0.079	0.066	0.056	0.037	0.025	0.017	0.012
12	0.887	0.701	0.557	0.497	0.397	0.319	0.257	0.208	0.187	0.168	0.137	0.112	0.092	0.076	0.069	0.062	0.052	0.043	0.027	0.018	0.012	0.008
13	0.879	0.681	0.530	0.469	0.368	0.290	0.229	0.182	0.163	0.145	0.116	0.093	0.075	0.061	0.055	0.050	0.040	0.033	0.020	0.013	0.008	0.005
14	0.870	0.661	0.505	0.442	0.340	0.263	0.205	0.160	0.141	0.125	0.099	0.078	0.062	0.049	0.044	0.039	0.032	0.025	0.015	0.009	0.006	0.003
15	0.861	0.642	0.481	0.417	0.315	0.239	0.183	0.140	0.123	0.108	0.084	0.065	0.051	0.040	0.035	0.031	0.025	0.020	0.011	0.006	0.004	0.002
16	0.853	0.623	0.458	0.394	0.292	0.218	0.163	0.123	0.107	0.093	0.071	0.054	0.042	0.032	0.028	0.025	0.019	0.015	0.008	0.005	0.003	0.002
17	0.844	0.605	0.436	0.371	0.270	0.198	0.146	0.108	0.093	0.080	0.060	0.045	0.034	0.026	0.023	0.020	0.015	0.012	0.006	0.003	0.002	0.001
18	0.836	0.587	0.416	0.350	0.250	0.180	0.130	0.095	0.081	0.069	0.051	0.038	0.028	0.021	0.018	0.016	0.012	0.009	0.005	0.002	0.001	0.001
19	0.828	0.570	0.396	0.331	0.232	0.164	0.116	0.083	0.070	0.060	0.043	0.031	0.023	0.017	0.014	0.012	0.009	0.007	0.003	0.002	0.001	0.000
20	0.820	0.554	0.377	0.312	0.215	0.149	0.104	0.073	0.061	0.051	0.037	0.026	0.019	0.014	0.012	0.010	0.007	0.005	0.002	0.001	0.000	0.000
21	0.811	0.538	0.359	0.294	0.199	0.135	0.093	0.064	0.053	0.044	0.031	0.022	0.015	0.011	0.009	0.008	0.006	0.004	0.002	0.001	0.000	0.000
22	0.803	0.522	0.342	0.278	0.184	0.123	0.083	0.056	0.046	0.038	0.026	0.018	0.013	0.009	0.007	0.006	0.004	0.003	0.001	0.000	0.000	0.000
23	0.795	0.507	0.326	0.262	0.170	0.112	0.074	0.049	0.040	0.033	0.022	0.015	0.010	0.007	0.006	0.005	0.003	0.002	0.001	0.000	0.000	0.000
24	0.788	0.492	0.310	0.247	0.158	0.102	0.066	0.043	0.035	0.028	0.019	0.013	0.008	0.006	0.005	0.004	0.003	0.002	0.001	0.000	0.000	0.000
25	0.780	0.478	0.295	0.233	0.146	0.092	0.059	0.038	0.030	0.024	0.016	0.010	0.007	0.005	0.004	0.003	0.002	0.001	0.001	0.000	0.000	0.000
26	0.772	0.464	0.281	0.220	0.135	0.084	0.053	0.033	0.026	0.021	0.014	0.009	0.006	0.004	0.003	0.002	0.002	0.001	0.001	0.000	0.000	0.000
27	0.764	0.450	0.268	0.207	0.125	0.076	0.047	0.029	0.023	0.018	0.011	0.007	0.005	0.003	0.002	0.002	0.001	0.001	0.000	0.000	0.000	0.000
28	0.757	0.437	0.255	0.196	0.116	0.069	0.042	0.026	0.020	0.016	0.010	0.006	0.004	0.002	0.002	0.002	0.001	0.001	0.000	0.000	0.000	0.000
29	0.749	0.424	0.243	0.185	0.107	0.063	0.037	0.022	0.017	0.014	0.008	0.005	0.003	0.002	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000
30	0.742	0.412	0.231	0.174	0.099	0.057	0.033	0.020	0.015	0.012	0.007	0.004	0.003	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000
35	0.705	0.355	0.181	0.150	0.068	0.036	0.019	0.010	0.008	0.006	0.003	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.672	0.307	0.142	0.097	0.046	0.022	0.011	0.005	0.004	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
45	0.639	0.261	0.111	0.073	0.031	0.014	0.006	0.003	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.608	0.228	0.085	0.054	0.021	0.009	0.003	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

2

MS in Poultry Science
Department of Dairy and Poultry Science
Chittagong Veterinary and Animal Sciences University
Final examination 2016,
Session: July-December
Course: Parent stock and Commercial layer management
(Answer any four. All questions are of equal marks)

Full marks: 40

Time: 2 hours

Questions:

1. Write importance of lighting in commercial layer farm. Describe different systems and management of lighting in layer farm.
2. Mention the types of poultry housing. Write construction and management of housing of parent stock layer.
3. Define brooding. Describe rearing management of commercial layer.
4. Mention the nutrient requirement for commercial layer and layer breeder. Give the table of vaccination schedule of a commercial layer flock.
5. How would you build a breeder flock? Describe breeding management of parent stock of commercial layer.

Chittagong Veterinary and Animal Sciences University
MS in Poultry Science Final Examination
July to December Semester 2016
Subject: Biochemistry of Egg (BCE-602)
Total Marks: 40. Time: 02 hours

Answer any five of the following questions **including question 1**; Figures in the right margin indicate the full marks

1. a) What is egg cholesterol, HDL and LDL ? 2
- b) Is the egg cholesterol detrimental for health- give your argument behind this ? 4
- c) Give your recommendations to reduce the risks arising from egg cholesterol 2
2. a) Mention the factors that affect egg shell 2
3. b) State the detailed and microscopic composition of egg shell 6
4. a) What is egg preservation ? State the different methods of preserving poultry eggs 5
- a) State the shell defects of egg with its probable causes and remedies 3
5. a) Define egg, and show the multiple uses of egg including the proportion of egg utilization 4
- b) Narrate the food value with chemical composition of poultry eggs 4
6. a) What is egg protein? State the composition of egg protein with its characteristics 4
- b) Mention the functional properties attributed to egg proteins in food systems 4
7. a) What is egg quality and egg grading systems ? 3
- b) Discuss the methods for determination of egg quality 5
8. Draw and label the anatomical structure of egg with description 8
9. Give a short note -any five of the following: (1.6 × 5=8) 8
 - a) Balut
 - b) Yolk composition
 - c) Misconception of eggs
 - d) Nutrition and egg quality
 - e) Various forms of eggs in food products
 - f) Abnormalities of egg
 - g) Microbiological impact on egg deterioration
 - h) Poultry egg and egg products.

Chittagong Veterinary and Animal Sciences University
MS in Poultry Science Final Examination
July to December Semester 2016
Subject: Poultry Feeds and Feeding (PFF-602)
Total Marks: 40. Time: 02 hours

Answer any five of the following questions **including question 1**; Figures in the right margin indicate the full marks

1. a) Define feed, feeding, diet, ration, balanced ration, unconventional and conventional feeds 3.5
b) Describe the potentiality of using unconventional feeds in poultry ? 3
c) State the calorie: protein ratio for poultry 1.5
2. a) What is feed additives? Discuss different sort of additives uses in poultry 4
b) Discuss the factors that are needed for formulating poultry diet 4
3. a) What is Limiting or anti-nutritional factors ? 2
b) Classify and discuss the toxic factors present in poultry feeds and the process of elimination 4
c). Distinguish between animal and plant protein 2
4. a) What is biological value? State the methods to determine the protein quality of feed 5
b). Discuss the factors that influence the FCR of poultry 3
5. a) What is feed processing? State the merits of processing poultry feeds 2
b) What is quality ? State the steps for ensuring the feed quality of poultry 4
c) Distinguish between fat soluble and water soluble vitamins 2
6. a) What is the essential, critical and limiting amino acids for poultry 3
b) State the factors that affect the amino acids requirement of poultry 5
7. a) Explain the interrelation of calcium, phosphorus and vitamin-D 3
b). Discuss phase, control and challenge feeding programs for poultry 5
8. **Give a short note -any five of the following: (1.6 × 5=8)** 8
 - a) Energy
 - b) Unidentified growth factor
 - c) Heat stress and nutrition
 - d) The nutrient interrelationships
 - e) Cage layer fatigue
 - f) Cafeteria feeding system
 - g) Feeding standard
 - h) Vitamin-mineral deficiency syndrome