

**ROYAL CIVIL SERVICE COMMISSION  
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2016  
EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALIZATION PAPER FOR ANIMAL SCIENCE**

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Date: 2 October 2016  
Total Marks: 100  
Examination Time: 150 minutes (2.5 hours)  
Reading Time: 15 minutes (*prior to examination time*)

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**GENERAL INSTRUCTIONS**

1. Write your Registration Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is being provided to check the number of pages, printing error, clarify doubts and to read instructions in Question Paper. You are NOT permitted to write during this time.
3. This paper consists of **TWO Sections, namely Section A and Section B.**

**Section A** has two parts: Part I - **30 Multiple Choice Questions.**

Part II - **4 Short Answer Questions.**

All questions under **Section A** are **COMPULSORY.**

**Section B** consists of 2 case studies. Choose only **ONE** case study and answer the questions under your choice.

4. All answers should be written on the Answer Booklet provided to you. Candidates are not allowed to write anything on the question paper. If required, ask for additional Answer Booklet.
5. All answers should be written with correct numbering of Section, Part and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating correct Section, Part and Question Number will NOT be evaluated and no marks would be awarded.
6. Begin each Section and Part in a fresh page of the Answer Booklet.
7. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
8. Use of any other paper including paper for rough work is not permitted.
9. You are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.
10. The Question paper has 9 printed pages including this Instruction Page.

**GOOD LUCK!**

**SECTION A**

**PART I – Multiple Choice Questions (30 marks)**

**Choose the correct answer and write down the letter of your chosen answer in the Answer Booklet against the question number e.g. 31 (c). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.**

1. What is the temperature and time for regular HTST pasteurization of milk?
  - a. 138°C for 2 sec
  - b. 72°C for 15 sec
  - c. 115°C for 20 min
  - d. 63°C for 30 min
  
2. What is the term for inflammatory reaction of tongue tissue?
  - a. Tendinitis
  - b. Tonsillitis
  - c. Gingivitis
  - d. Glossitis
  
3. The method of crossing two different breeds that have complimentary traits to produce a hybrid progeny is called
  - a. Inbreeding
  - b. Cross breeding
  - c. Cloning
  - d. Back-crossing
  
4. A type of reproduction by which offspring arise from a single organism, inherit the genes of that parent and almost never changes the number of chromosomes is called
  - a. Spermatogenesis
  - b. Asexual reproduction
  - c. Oogenesis
  - d. Sexual reproduction
  
5. What will be the approximate dressed weight of a pig that has body length of 1.02 meters and heart girth of 1.27 meters?
  - a. 82
  - b. 98
  - c. 107
  - d. 114
  
6. Name the final segment of the digestive tract of a cow?
  - a. Ilium
  - b. Jejunum
  - c. Caecum
  - d. Rectum

7. What is the single most important factor affecting quality of forage at harvest?
  - a. Abundance of fertilizer.
  - b. Availability of water at harvest.
  - c. The plants stage at maturity.
  - d. The dry matter content.
  
8. What is the term for immature female horse?
  - a. Foal
  - b. Gelding
  - c. Filly
  - d. Pony
  
9. Which of the following criteria are used for evaluation of semen?
  - a. Motility
  - b. Volume
  - c. Concentration
  - d. All of the above
  
10. What is the average light requirement per day for maximum year round egg production in layers?
  - a. 11-13 hours
  - b. 14-16 hours
  - c. 17-19 hours
  - d. 20-22 hours
  
11. What will be the approximate daily concentrate requirement for a jersey cow (BW-350kg) yielding 10 litres of milk?
  - a. 4 kg.
  - b. 7kg.
  - c. 10kg.
  - d. 13kg.
  
12. Which of the following in yogurt gives its texture and characteristic tang?
  - a. Lactic acid
  - b. Butyric acid
  - c. Salicylic acid
  - d. Hydrochloric acid
  
13. Which of the following is a newer concept of population management under the existing National Dog Population Management and Rabies Control Program?
  - a. Impounding
  - b. Mass rabies vaccination
  - c. Animal welfare
  - d. Community Animal Birth Control

14. Which of the following vaccine is provided by the Department of Livestock to the clients on cost sharing basis?
- Fowl pox vaccine
  - Infectious Bursal disease vaccine
  - Marek's disease vaccine
  - None of the above
15. A cow is reluctant to move in a downward slope. The condition may be caused by a sharp object penetrating the diaphragm. What is the condition called?
- Acute myocarditis
  - Traumatic Reticulo-pericarditis
  - Acute splenomegaly
  - Spongiform Encephalopathy
16. Which of the following is an endangered species of fish in Bhutan and therefore liable for conservation?
- Siberian Sturgeon (*Acipenser baerii*)
  - Golden Mahseer (*Tor putitora*)
  - Rainbow trout (*Oncorhynchus mykiss*)
  - African sharp tooth (*Clarias gariepinus*)
17. Which of the following meat type turkey breed was introduced in Bhutan in 2012?
- White Holland
  - American Bronze
  - Black Spanish
  - Bourbon Red
18. What is the best moisture content level for making pit silage?
- 60-65%
  - 55-60%
  - 50-55%
  - 65-70%
19. A farmer reports that one of his recently calved high yielding dairy cow is in lateral recumbency. On clinical examination, the temperature is subnormal and the head is tucked in flanks. What could be the appropriate underlying cause of this condition?
- Enterotoxaemia
  - Retention of Placenta
  - Pyometra
  - Parturient paresis
20. Which of the following is a simple stomach animal?
- sheep
  - Yak

- c. Horse
  - d. Bufallo
21. A cow suffering with chronic diarrhoea is found to have 500epg of Fasciola. Using triclabendazole, which comes as Fasinex 900mg bolus, how many bolus will you give to the cow weighing 430 kg?
- a. 3 boli
  - b. 5 boli
  - c. 7 boli
  - d. 9 boli
22. Which of the following is an exotic honeybees commercially reared by Beekeepers Association of Bhutan?
- a. *Trigona iridipennis*
  - b. *Apis dorsata*
  - c. *Apis cerana*
  - d. *Apis mellifera*
23. Which of the following breeding program was discontinued due to its poor performance in the Bhutanese terrain?
- a. Haflinger
  - b. Boeta
  - c. Spiti
  - d. Heku
24. Barbari, Saanen, Beetal and Sirohi are breeds of which animal?
- a. Bufallo
  - b. Sheep
  - c. Goat
  - d. Cattle
25. What is the breed of dairy cattle imported by the Department of Livestock in 2014 to enhance milk production in the country?
- a. Holstein Frisian
  - b. Sahiwal
  - c. Karan Fries
  - d. Red Sindhi
26. Frizzle, pure black and naked neck are native breeds of \_\_\_\_\_.
- a. Pig
  - b. Sheep
  - c. Poultry
  - d. Goat

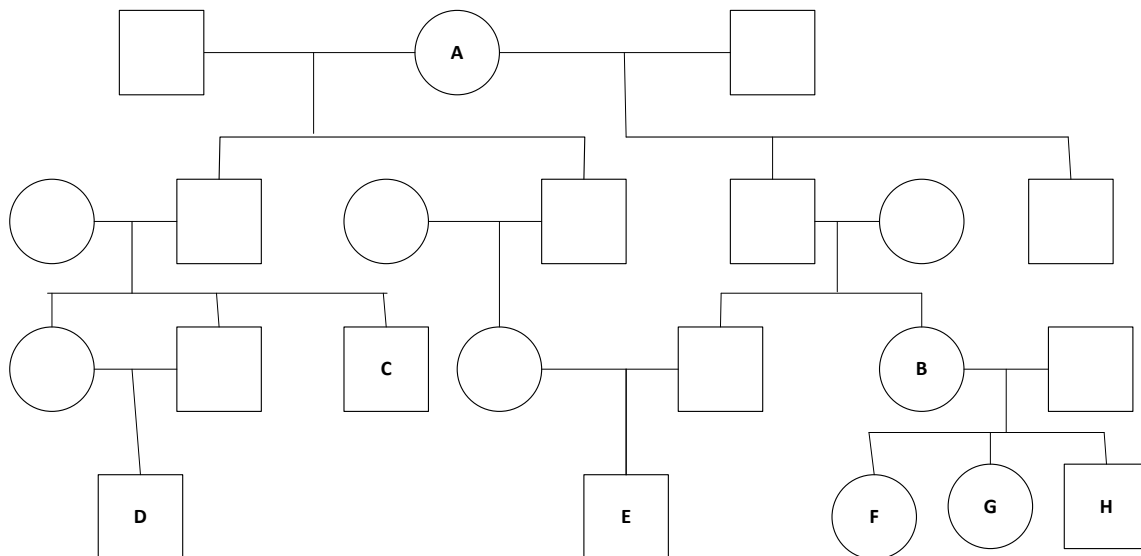
27. Which of the following is not a cause of Cannibalism in poultry?
- Over crowding
  - Dietary deficiencies
  - Debeaking
  - Insufficient feeder and watering equipments
28. *Tall fescue*, *Cocks foot* and *Italian rye* are examples of \_\_\_\_\_.
- Alpine fodder grasses
  - Temperate fodder grasses
  - Sub-tropical fodder grasses
  - Tropical fodder grasses
29. A dairy technology that entails collecting fertilized ova and transferring them to a synchronized recipient to complete the gestation period is called \_\_\_\_\_.
- In-setu Fertilization
  - Embryo Transfer
  - Super Ovulation
  - Artificial Insemination
30. An acute febrile highly fatal disease of cattle and sheep caused by *Clostridium chauvoei* and characterized by emphysematous swelling commonly affecting healthy animals is called \_\_\_\_\_.
- Pasteurellosis
  - Enterotoxaemia
  - Blackleg
  - Tetanus

**PART II – Short Answer Questions (20 marks).**

**This part has 4 Short Answer Questions. Answer ALL the questions. Each question carries 5 marks.**

1. Examine the following pedigree diagram carefully. "A" in the diagram represents a purebred sire used by Mr. Jimba Norbu for breeding his household herd.

Based on the breeding facts and the diagram below, answer the following questions:



- a) Which of the individual(s) in this pedigree is/are inbred? (1 mark)
  - b) Name two genetic disadvantages of progeny "E"? (2 marks)
  - c) Name the term for breeding progeny "H" with its parent "B"? (1 mark)
  - d) List one advantage of breeding progeny "H" with its parent "B"? (1 mark)
2. Aum Dema of Thangbi, Bumthang has secured adequate funds and plans to start a 200 birds poultry flock. She just abandoned the idea of broiler farming as it involves killing. She thinks layer farming is a better option. Thangbi is located approximately 20 km from Jakar town at an altitude of 2800 masl. She approaches you for your guidance and advice.  
In relation to the above statement, briefly answer the following questions:
    - a) Develop a checklist of vaccination schedule for her layer flock? (1 mark)
    - b) What would be the most suitable housing design for the layer farm in Thangbi? (1 mark)
    - c) Design a marketing plan for the eggs produced from her farm? How much will she earn on monthly basis (2 marks)
    - d) What would be your advice on the spent layers? (1 mark)
  3. The Department of Livestock has posted you in Dobhan Gewog under Sarpang Dzongkhag as a Livestock Production Officer. The 24 km stretch of feeder road that connects Gelephu and Dobhan breaks down in monsoon. On your arrival, you found out that Dobhan is a dairy

potential area, many household rear Jersey, however, farmers are not aware of improved pasture and the dairy technology.

In relation to the above, answer the following questions:

- a) List down three most suitable pasture species that you will advocate for Dobhan? (1 mark)
  - b) How will the marketing strategy differ for dairy products in winter and summer? (1 mark)
  - c) What would be your monsoon arrangements to continue uninterrupted service provision to the farmers (1 mark)
  - d) Outline single most intervention to further promote dairy farming in Dobhan? (2 marks)
4. Laboratory test results were rabies positive for a milking cow that died of suspected rabies in Orong, S/Jongkhar. Three neighbors in the village including the owner consumed the meat from the dead cow. Five household in the village regularly buy milk from the owner. You were informed only on third day of the above incident.

In relation to above, answer the following questions:

- a) Develop a priority list of people for post exposure prophylaxis that you will submit to Orong BHU? (1 mark)
- b) Do you think that people who consumed milk should be included in the priority list? Justify your answer (1 mark)
- c) What is the most appropriate sample for rabies diagnosis from the above case? (1 mark)
- d) Briefly describe the activities carried out by the Department to prevent rabies in animals? (2 mark)

## SECTION B

### Case Study

**Choose either Case 1 or 2 from this section. Each case study carries 50 marks.**

#### Case 1

Fodder and nutrition resources play a crucial role in livestock development. Although animal nutrition program was initiated a decade ago, inadequate availability of fodder and nutrition is still one of the major constraints for livestock productivity in Bhutan. Further, only a handful of commercial feed manufacturers coupled with long distance transport of feed has resulted in high cost of commercial feeds thereby decreasing profit margins of the farmers.

In light of these developments,, answer the following questions:

- i) Describe two real challenges faced by the farmers due to which they are unable to meet their own feed and nutrition demand? (10 marks)
- ii) Describe two strategies to overcome fodder and nutrition shortage at high and mid altitude areas? (10 marks)



- iii) What fodder species would you recommend for winter in mid and low altitudes? Give justifications for each of the fodder species you recommend? (10 marks)
- iv) Describe two technologies that can be promoted in Bhutan to overcome the fodder and nutrition shortage problems? (10 marks)
- v) Discuss a long term strategy to enhance feed accessibility and development for Bhutan? (10 marks)

**OR**

**Case 2**

Fresh milk is abundantly available in Samtse. Fresh milk is made available in the market by National Jersey Breeding Centre as well as fresh milk coming in across the border. Despite the availability of the milk, Mr. Sangay plans to establish 10 cow dairy unit at Buduney, Samtse and market his products. Obviously, Mr Sangay needs to be competitive. He seeks your advice.

In relation to the above statement, answer the following questions:

- i) Discuss the most suitable infrastructure for 10 cow dairy unit at Buduney? What are the factors that you will consider for this housing design? (10 marks)
- ii) Describe your plan for pasture development? Justify the area requirement and the pasture species in your description. (10 marks)
- iii) Describe strategies to produce milk that gives competitive advantage over the existing milk in the market? (10 marks)
- iv) Considering the economy and the existing market, discuss possible product processing and value addition that you would recommend? (10 marks)
- v) Design a long term strategy for disposal of unproductive animals from the farm? (10 marks)

\*\*\*TASHI DELEK\*\*\*