FACULTY	**Health Sciences and Veterinary Medicine**		
DEPARTMENT	**Production Animal Clinical Studies**		
SUBJECT	**Production Animal Clinical Studies I**		
SUBJECT CODE	**V3830PP**		
DATE	**June 2026**		
DURATION	**3 hours**	**MARKS**	**150**

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This question paper consists of 13 pages, including this front page.

Instructions

Read the questions carefully
Answer ALL questions
Write clearly and concisely

Second Opportunity Examination

SECTION A
PIG HEALTH AND PRODUCTION [75 marks]

Part One: Multiple Choice Questions [28 marks]

1. The role of the Livestock and Livestock Products Board includes the following, except:
    A. Ensuring that pigs are confined in an approved pig-proof camp, sties or pens
    B. Ensuring a market for pig producers
    C. Providing incentives in the form of better prices.
    D. Providing price incentives ranging from 10-20% depending on the price in South Africa
    E. Ensuring that pigs can only move from a registered establishment

2. Abnormal behaviours (stereotypes) associated with pig confinement include the following, except:
    A. Bar biting
    B. Reverse dunging
    C. Sham chewing
    D. Excessive drinking
    E. Tongue rolling

3. Which of the following statements is false with respect to the provisions of The Prevention of Undesirable Residues in Meat Act, 1991 (Act No. 21 of 1991).
    A. The Act prohibits use of growth promoters which includes stilbenes
    B. The Act prohibits use of thyrostatics
    C. The Act prohibits use of ractopamine
    D. The Act prohibits use of zeranol (ralgro)
    E. The Act prohibits use of oestrogenic, androgenic and gestagenic compounds

4. Which of the following mycotoxins have been associated with pseudopregnancy, vulvovaginitis and swollen prepuce in pigs?
    A. Aflatoxin
    B. Zearalenone
    C. Ergot
    D. Vomitoxin
    E. Feed refusal factor

5. Arrange the following three pig traits according to their heritability, starting with the least heritable trait. Select the most appropriate arrangement. [1]
    A. Production traits, reproductive traits, product traits
    B. Product traits, production traits, reproductive traits
    C. Reproductive traits, production traits, product traits
    D. Production traits, product traits, reproductive traits
    E. Reproductive traits, product traits, production traits
    F. Product traits, reproductive traits, production traits

6. A farmer observed poor growth is his weaners despite being fed a commercial diet. Other clinical signs observed in some of the weaners include: cyanosis of extremities, ataxia, convulsions, skin petechiae and lymphadenopathy. Classical swine fever is suspected even though the herd is vaccinated against the disease. As the local state veterinarian what laboratory test would you request to confirm the tentative diagnosis.
    A. ELISA
    B. RT-PCR
    C. Complement Fixation Test
    D. Indirect Fluorescent Antibody Test
    E. Slide Agglutination Test

7. You are presented with 5% of the weaners in a pen showing lameness without nervous signs. Post-mortem examination reveals the following findings in Figure 1.



Figure 1

What could be the most likely aetiological diagnosis?

    A. *Glaesserella parasuis*
    B. *Erysipelothrix rhusiopathiae*
    C. *Mycoplasma hyosynoviae*
    D. *Mycoplasma hyorhinis*
    E. *Streptococcus suis*

8. A fifth parity sow is down with mastitis and has signs of endotoxic shock. Which of the following is the most likely aetiology?
    A. *T pyogenes*
    B. *E coli*
    C. *Streptococci* spp.
    D. *Staphylococci* spp.
    E. *Klebsiella* spp.

9. A commercial pig farm that has been pseudorabies-free for two years experiences a sudden outbreak of respiratory disease in nursery pigs and abortions in sows. No new animals have been introduced, and biosecurity protocols appear intact. Which of the following mechanisms BEST explains this recurrence?

    A. Mutation of the vaccine strain to virulence
    B. Reactivation of latent infection in carrier pigs following stress
    C. Transmission via wild birds migrating through the facility

D. Contamination of feed with pseudorabies virus from an external source
E. Horizontal transmission from vaccinated pigs shedding vaccine virus

10. During a pseudorabies outbreak investigation, epidemiologists are assessing the risk of transmission between two piggeries located 1.5 km apart. Weather conditions include high humidity and moderate winds. Which of the following statements regarding transmission risk is MOST accurate based on pseudorabies epidemiology?

A. Transmission is unlikely because the virus is inactivated by sunlight within 1 hour
B. Aerosolised virus can travel up to 2 km under certain weather conditions
C. Transmission is impossible because birds do not carry the virus mechanically
D. Transmission risk is negligible because the virus survives only 2 hours in the environment
E. Transmission can only occur through direct nose-to-nose contact between pigs

11. A producer with endemic porcine reproductive respiratory syndrome (PRRS) notes that only nursery pigs show respiratory disease after maternal antibodies wane. Which statement explains this pattern?

A. Only piglets are susceptible to PRRS infection
B. The herd has no immune animals
C. Susceptible subpopulations are affected in endemic PRRS
D. Virus survives better in cold nursery environments
E. Nursery feed predisposes pigs to PRRS

12. During a winter outbreak, weaned pigs develop chronic respiratory disease, reduced daily gain (≈85%), and 15% mortality. Mixed infections with *Streptococcus suis* and *Mycoplasma hyopneumoniae* are detected. What characteristic of PRRS predisposes to these bacterial infections?

A. It suppresses antibody production in sows
B. It causes severe immunosuppression of T-cells
C. It predisposes to gram-negative infection through LPS interaction
D. It causes malnutrition due to anorexia
E. It induces chronic diarrhoea

13. A farm wants to eliminate PRRS without depopulation. What is the minimum recommended duration of the herd closure strategy?

A. 2 months
B. 3 months
C. 4 months
D. 6 months
E. 12 months

14. A 2-day-old piglet has abdominal distension, scrotal oedema, and mild dyspnoea. Diarrhoea is absent. Necropsy shows hydrothorax, ascites, and oedema of the ascending colon. What is the MOST likely cause?

    A. *Isospora suis* infection
    B. Clostridium difficile enteritis
    C. Oedema disease
    D. Ileitis
    E. Enterotoxigenic *E. coli* (ETEC) infection

15. Postmortem samples from an outbreak of diarrhoea in suckling piglets show Gram-positive rods colonising necrotic villi, consistent with bacterial invasion. Disease is peracute. Which diagnostic method is MOST appropriate to confirm the toxin involved?

    A. Latex test
    B. Immunodiffusion
    C. PCR for beta toxin gene
    D. Antibody titers
    E. Faecal flotation

16. Piglets born on a farm repeatedly develop fatal haemorrhagic enteritis despite antibiotics being given at clinical onset. What is the MOST effective immediate control measure?

    A. Treat piglets with ivermectin
    B. Give Type C antitoxin within 2 hours of birth
    C. Vaccinate piglets at birth
    D. Reduce iron injections
    E. Withhold feed for 24 hours

17. A farm with severe enterotoxigenic E. coli (ETEC) outbreaks wishes to prevent early piglet infections. Which preventive measure directly provides lactogenic immunity?
    A. Mass medication with tetracycline
    B. Vaccination of boars
    C. Vaccinating gestating sows with pilus-specific vaccines
    D. Antibiotics in creep feed
    E. Zinc oxide supplementation

18. You are managing a herd outbreak of salt toxicity. Which rehydration protocol is MOST appropriate for the affected group?
    A. Provide unlimited fresh water immediately to correct dehydration rapidly
    B. Withhold all water for 12 hours, then reintroduce gradually
    C. Offer fresh water at 0.5% of body weight per hour, gradually increasing over 24–72 hours
    D. Administer oral electrolyte solution hourly to support recovery
    E. Give intravenous 0.9% saline boluses to each affected pig until full clinical recovery

19. A pig shows periocular swelling, incoordination, and a characteristic "squeal." Necropsy shows gelatinous oedema in the gastric submucosa. Which toxin is chiefly responsible?
    A. Heat-labile toxin
    B. Beta toxin
    C. Shiga toxin 2e
    D. Toxin A
    E. Toxin B

20. A finishing unit located 7 km from an infected breeding herd becomes PRRS-positive despite strict biosecurity. What transmission route is most consistent with this scenario?

    A. Rodent contamination
    B. Aerosol spread
    C. Contaminated feed bags
    D. Spread by dogs
    E. Vertical transmission

21. A 600-sow farrow-to-finish farm reports a sudden onset of coughing, fever (41.8°C), depression, prostration, and serous nasal discharge affecting ~75% of grower pigs within 36 hours. Mortality is approximately 3%. Which finding is MOST characteristic of Influenza A virus (IAV-S) and helps distinguish it from other respiratory pathogens?

    A. High mortality (>15%) with hemorrhagic lung lesions
    B. Slow progression over 2–3 weeks with chronic coughing
    C. Sudden onset with rapid herd-wide spread within 1–3 days
    D. Primary neurological signs with pruritus
    E. Profuse watery diarrhoea in neonatal piglets

22. A farm has recurrent episodes of neurological disease in pigs. Water analysis is normal, but feed analysis occasionally shows salt levels of 2.0–3.0%. Which preventive measure is MOST critical to implement?
    A. Vaccinate against pseudorabies and *Streptococcus suis*
    B. Install a backup water pump to prevent deprivation
    C. Require certificates of analysis for all feed batches and verify salt content before use
    D. Add antioxidants to the feed to protect against neuronal damage
    E. House pigs at a lower stocking density to reduce stress

23. You suspect acute swine influenza in a finishing unit where clinical signs began 48 hours ago. Which sample type and collection strategy offers the HIGHEST diagnostic yield for RT-PCR confirmation?
    A. Serum collected 21 days post-onset for HI antibody testing
    B. Nasal swabs from febrile, acutely affected pigs during the first 3–4 days of illness
    C. Lung tissue from pigs that died 10 days after clinical signs appeared
    D. Faecal samples from asymptomatic weaners
    E. Udder wipes from sows 2 weeks after piglets showed signs

24. A farmer reports that pigs fed a wet mash containing whey and watered from a borehole are showing blindness and circling. Borehole water analysis reveals 0.8% total salt. What is the MOST appropriate immediate action?

A. Administer intravenous hypertonic saline to correct dehydration
B. Provide unrestricted fresh water to all pigs immediately
C. Remove the whey-containing feed and borehole water; provide low-sodium water in controlled amounts
D. Treat all pigs with antibiotics for suspected meningitis
E. Euthanise all affected pigs immediately since the prognosis is poor.

25. A producer aims to protect nursery piglets against swine influenza using maternal immunity. Which vaccination protocol is MOST evidence-based for this objective?
A. Vaccinate piglets at 3 weeks with a live-attenuated vaccine
B. Vaccinate sows pre-farrowing to enhance colostral antibody transfer
C. Vaccinate boars quarterly to reduce shedding
D. Use autogenous vaccines only after laboratory confirmation of outbreak strain
E. Mass vaccinate the entire herd simultaneously every 6 months

26. A pig farmer is experiencing difficulties in controlling pleuropneumonia in his piggery despite antibiotic use. Which management intervention would be MOST useful?
A. Improving ventilation
B. Introduce strict biosecurity measures
C. Implementing all-in/all-out and reducing stocking density
D. Feeding antibiotics at high prophylactic doses
E. Increasing floor space

27. A 150-pig finisher unit reports that several pigs are wandering aimlessly, pressing their heads against walls, and having intermittent seizures. The farmer mentions that the automatic watering system failed 36 hours ago, but has now been repaired. Feed analysis shows normal salt content (0.4%). What is the MOST likely diagnosis?
A. Pseudorabies (Aujeszky's disease)
B. Salt toxicity secondary to water deprivation
C. Organophosphate insecticide poisoning
D. Streptococcal meningitis
E. Phenylarsonic compound toxicity

28. During a swine influenza outbreak, an immunocompromised farm worker develops severe pneumonia. Regarding zoonotic transmission of swine IAV, which statement is MOST accurate?
A. Swine influenza viruses readily transmit between humans and commonly cause seasonal epidemics
B. Pigs are dead-end hosts and cannot acquire human or avian influenza viruses
C. Pigs can act as "mixing vessels" for reassortment of avian, human, and swine IAV genomes
D. Only H1N1 subtype from swine has documented zoonotic potential
E. Human-to-swine transmission is epidemiologically insignificant

Part Two: Short and Long Answer Questions [47 marks]

29. A piggery would like to ensure 4 farrowings per week for optimum productivity. Assuming a farrowing "rate" of 80%, how many services per week should be planned. [1]

30. A grower pig died suddenly without premonitory signs. Crepitation was felt on deep palpation of the neck. Post-mortem findings are highlighted in Figure 3.



Figure 3

a) Describe the aetiology and pathogenesis of this disease? [6]

31. An upcoming pig farmer with a 2-sow unit has one lactating and one dry sow. The lactating fifth parity sow nursing 10 one-week-old piglets dies of gastric torsion. Advise how the farmer can feed the 10 orphaned piglets. [4]

32. A pig farmer in the Zambezi Region decided to build facilities in an area without electricity. Outline what advice you would give as regards methods of cooling that he can implement at the piggery? [6]

33. Write short notes on the following as regards pig production and health:
    a) In some intensive swine production systems, dry sows are kept in stalls. State the reasons for this practice [3] and the health problems that may arise [2].

    b) Define biosecurity as applied to a pig enterprise. [2] Describe the three levels of biosecurity, giving an example of each? [3]

34. As part of a herd health programme, you conduct routine slaughter checks on 200 pigs from a finishing unit. Findings:
    - 65% show cranioventral pulmonary consolidation (CVPC)
    - 30% have fibrinous pleurisy (mainly caudal lobes)
    - 15% have both lesions

    a) Interpret these findings: Which pathogens are MOST likely associated with (i) CVPC and (ii) pleurisy? [4]
    b) Why are these lesions NOT pathognomonic? Give ONE example of an alternative cause for each lesion type. [2]

c) Based on these results, propose FOUR practical on-farm control measures to reduce PRDC incidence in the next production cycle. Justify your answers. [4]

35. A farm reports diarrhoea and stunting with up to 25% mortality in piglets aged 6–14 days. Necropsy shows villous atrophy of the ileum and jejunum. Giemsa-stained mucosal smears reveal large numbers of immature coccidial forms. Write short notes under the following headings:
    a) Diagnosis [4]
    b) Epidemiology [3]
    c) Control [3]

SECTION B

POULTRY HEALTH AND PRODUCTION [75 marks]

Part One Multiple Choice Questions [5]

1. What triggers moulting in birds?
a) Increased feed intake and egg production
b) Thyroid hormone, influenced by nutrition, light, and temperature
c) High levels of testosterone
d) Bacterial infections of the skin and feathers

2. The proventriculus is distinct from the gizzard because it is primarily responsible for:
a) Mechanical grinding of food
b) Chemical digestion through secretion of HCl and pepsin
c) Water absorption and faecal storage
d) Fermentation of fibrous material

3. What is the copulatory organ in most male poultry (excluding ducks and ostriches)?
a) An external penis
b) A phallus, which is an internal protuberance on the vent lip
c) A cloacal kiss where no organ is inserted
d) A spermatophore that is transferred to the female

4. What is the function of the paired caeca in the avian digestive system?
a) To store bile produced by the liver
b) To grind tough food particles
c) To ferment undigested material and absorb water
d) To produce enzymes for protein digestion

5. Which of the following statements is true regarding the avian urinary system?
a) Birds have a well-developed urinary bladder for storing urine.
b) Kidney function is measured by BUN (blood urea nitrogen) levels.
c) Birds have both mammalian-type and reptilian-type nephrons.
d) Uric acid is highly soluble and excreted as a dilute liquid.

Part Two (Short Answers) [70]

1. As the poultry industry moves towards more intensive production methods to meet the needs of a rapidly expanding population, two of the most common housing systems in use today are the deep litter system and the battery cage system. Both systems have distinct advantages and disadvantages, which farmers must weigh based on their specific needs and goals for production

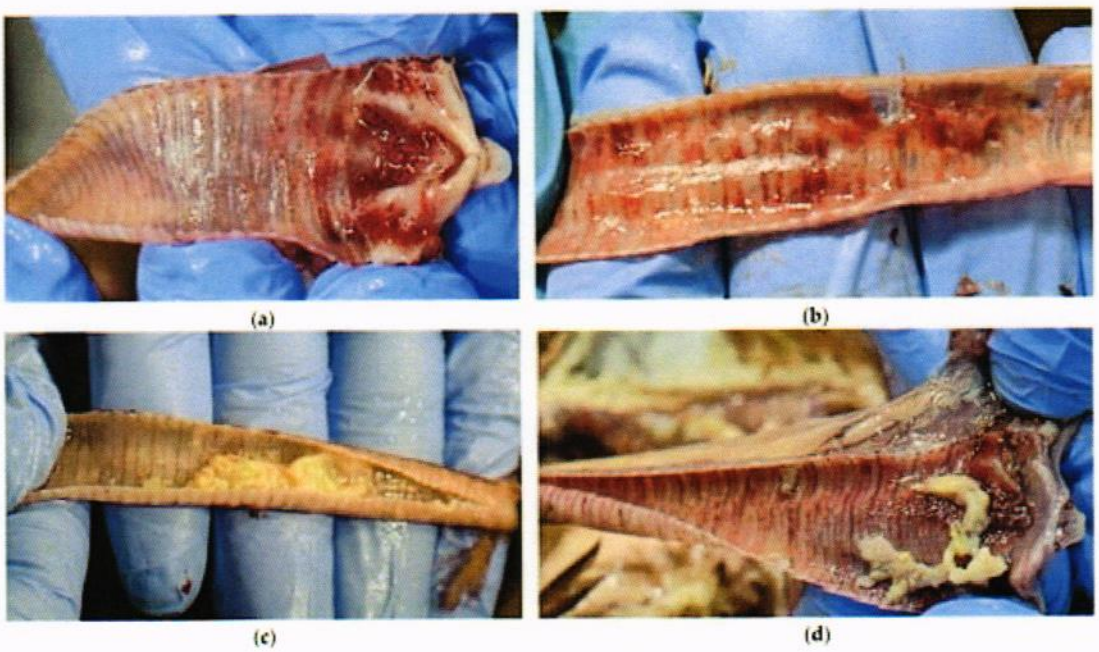
Describe these two (2) main poultry production systems used [3], highlighting three advantages and disadvantages of each system. [12]

2. Compare and contrast the following neoplastic diseases of poultry by completing the following table: [12]

Item	Mareks disease	Lymphoid leucosis	Reticuloendotheliosis
Aetiology	[1]	[1]	[1]
Lymphoma cell type	[1]	[1]	[2]
Control measures	[3]	[1]	[1]

3. A commercial layer farm near Windhoek reports sudden onset of gasping, coughing, nasal discharge and conjunctivitis in 30-week-old hens. Mortality reaches 10% in one week, with egg drop of 20%. Necropsy showed the following (see pictures below)





a) Describe the post-mortem lesions depicted in the pictures above. [5]

b) Based on the history given and post-mortem lesions, give 5 differential diagnoses and your tentative diagnosis? [5]

c) What treatment options are available for the affected birds [6]

4. A commercial poultry farm owner contacts you, a veterinarian specializing in avian health, regarding a sudden onset of respiratory signs in their laying hens. They describe symptoms such as nasal discharge, facial swelling, and decreased egg production. Upon further examination, you notice some birds displaying conjunctivitis and a foul odour emanating from their nasal passages. The owner is concerned about the potential impact on their flock and seeks your expertise to diagnose and manage the situation.



Fig 4a



Fig 4b

a) Based on the clinical presentation described, what differential diagnoses would you consider? (most likely first) [5]

b) What prevention and control measures would you suggest to the affected farmer? [5]

5. What is Fatty Liver Haemorrhagic Syndrome (FLHS)? [2]

a) What are the main causes of FLHS? [5]

b) What treatment would you recommend? [4]

6. An upcoming farmer from the NCA has called complaining of decreased feed and water consumption in his flock of chickens. He has noticed that there is a decreased growth rate with a high percentage of visibly sick birds with severe bloody diarrhoea. Upon opening a few carcasses that he brought along, you notice that the caecum is distended with a thickened wall and extensive haemorrhage, as shown in the pictures below, and you highly suspect coccidiosis.



Fig 6a



Fig 6b

As advice to the farmer, discuss strategies that are available for the prevention and control of Avian Coccidiosis [11]

END OF EXAMINATION