

THE ROYAL COLLEGE OF VETERINARY SURGEONS

DIPLOMA EXAMINATION IN VETERINARY OPHTHALMOLOGY

Tuesday 27 April 1999

PAPER 1

(3 hours)

Candidates are required to answer **ALL 10** questions on this paper.

*Illegible handwriting or failure to answer the question in the form requested may result in examiners being unable to award marks for information which candidates intended to convey.*

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1. Compare and contrast, with the assistance of annotated diagrams, the structures associated with aqueous drainage in dogs and primates.
2. Describe those anatomical features that are important in the examination and treatment of the eye and adnexa of the rabbit.
3. List the types of laser available for the treatment of ophthalmic disorders. For what types of problem might each be used?
4. What is the current level of understanding of the aetiology of Equine Recurrent Uveitis?
5. Describe the potential ocular manifestations of hyperlipidaemia. What systemic diseases may be associated with hyperlipidaemia?
6. Describe methods of treatment for distichiasis in the dog indicating the advantages and disadvantages of each method.
7. Describe the factors that are important in the development of cataract in farmed salmon.
8. Describe the conditions that may result in visual failure in cattle.
9. What procedures would you use in removing the severely traumatised eye of a cow under farm conditions?
10. Describe those conditions which result in abnormal appearance of the equine granula iridica (corpora nigra).

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THE ROYAL COLLEGE OF VETERINARY SURGEONS

DIPLOMA EXAMINATION IN VETERINARY OPHTHALMOLOGY

Tuesday 27 April 1999

PAPER 2

(3 hours)

Candidates are required to answer **FIVE** out of the following six questions.

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1. Describe the structure and relationship of the normal retinal pigment epithelium and its role in health and disease.
2. In what ways do avian and mammalian eyes differ, both from anatomical and functional viewpoint?
3. A thoroughbred yearling is presented with a unilateral corneal ulcer, which has progressed rapidly to descemetocoele formation. Discuss in detail your management of this animal.
4. Describe the clinical forms in which squamous cell carcinoma affects the ocular structures of cats, cattle and horses. How would you make a specific diagnosis and what forms of treatment are available?
5. You are presented with a five-year-old flat-coated retriever with a history of sudden onset right unilateral blindness of four hours' duration. The intraocular pressures are 48mmHg in the right eye and 15 mmHg in the left eye. Your diagnosis is of closed angle glaucoma as a result of goniodysgenesis. Discuss the various options available for immediate and on-going management. Give an indication of, and rationale for, your preferences in management.
6. What physiological mechanisms regulate retinal and choroidal blood pressure? How are intraocular blood vessels affected by systemic hypertension and what clinical consequences result from these changes? How would you investigate a case of suspected "hypertensive retinopathy" in a dog?

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THE ROYAL COLLEGE OF VETERINARY SURGEONS

**DIPLOMA EXAMINATION IN VETERINARY OPHTHALMOLOGY**

Tuesday 28 March 2000

PAPER 1

(3 hours)

Candidates are required to answer **ALL** 10 questions on this paper, and only short answers are required. Allow 18 minutes per question. The use of simple labelled diagrams is encouraged.

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1. Briefly describe what you understand by the terms 'conventional' and 'unconventional' outflow of aqueous, and the routes by which these occur in dogs. What is known of the relative contributions of these pathways to aqueous drainage in four named species?
2. Describe the ocular manifestations of equine motor neurone disease (EMND). What is the suspected pathogenesis of the condition? Briefly outline how EMND compares with similar diseases in dogs.
3. Describe the conditions which may result in defective vision in a seven month old Charolais bull.
4. What surgical techniques are available for the management of upper lid entropion in Cocker Spaniels? Discuss their relative merits and demerits.
5. What options are available for the treatment of squamous cell carcinoma which is involving the bulbar conjunctiva and adjacent cornea in a piebald gelding? Which would you favour, and why?
6. Give an outline of the aetiopathogenesis and significance of intra-ocular fibrovascular membrane formation.
7. What factors may predispose to the development of the following in rabbits:
  - a) dacryocystitis
  - b) uveitis.

How would you approach the management of these conditions?

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8. What are the indications for and limitations of electroretinography in small animal ophthalmic practice?
9. Compare the anatomical features and mechanisms of movement of the third eyelid in dogs, cats and birds.
10. What factors would you take into consideration when assessing the suitability of a canine patient for cataract surgery by phacoemulsification? Briefly outline the potential complications of the procedure.

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THE ROYAL COLLEGE OF VETERINARY SURGEONS

**DIPLOMA EXAMINATION IN VETERINARY OPHTHALMOLOGY**

Tuesday 28 March 2000

PAPER 2

(3 hours)

Candidates are required to answer **FIVE** out of the following six questions. Allow 36 minutes per question. The use of simple labelled diagrams is encouraged.

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1. Discuss the difficulties associated with the diagnosis and management of mycotic keratitis in horses.
  2. Discuss the aetiopathogenesis and treatment of feline corneal sequestrum.
  3. Discuss (using diagrams) the development and appearance of retinal dysplasia as it is manifested in the Golden Retriever breed. Indicate possible difficulties in certifying the presence or absence of this condition.
  4. Discuss the ocular manifestations of systemic disease in cattle.
  5. Discuss the concept of neuroprotection in relation to the management of glaucoma.
  6. Describe the anatomy of the oculomotor nerve (cranial nerve III ) and its associated autonomic nerve fibres. Detail the clinical manifestations of unilateral oculomotor nerve paralysis. How would you investigate such a problem in a nine year old cat?

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THE ROYAL COLLEGE OF VETERINARY SURGEONS

**DIPLOMA IN VETERINARY OPHTHALMOLOGY**

**WEDNESDAY 8 AUGUST 2001**

**PAPER I**

(3 hours)

Candidates are required to answer **ALL** 10 questions on this paper, and only short answers are required. Allow 18 minutes per question. The use of simple labelled diagrams where appropriate, is encouraged.

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1. You are presented with a Siamese cat with esotropia. Explain the most likely underlying neurological defect.
2. **List** common diseases of the eye and adnexa in the guinea pig. Describe the diagnosis and management of two of the conditions you have listed.
3. What are the characteristics of the anterior chamber-associated immune mediated (ACAID) response?
4. **List** the structures of ophthalmic relevance to be found in the cavernous sinus. What clinical signs may be exhibited in patients with cavernous sinus syndrome?
5. **List** the therapeutic agents that are potentially useful in the management of glaucoma in dogs. Briefly indicate their known modes of action. What are the potential advantages and limitations of each drug?
6. **List** those parasites which may be associated with intraocular disease in the dog. Describe the treatment of one of the conditions you have listed.

**P.T.O. FOR QUESTIONS 7, 8, 9, and 10**

7. What role does pharmacological testing play in veterinary ophthalmic diagnosis? What are the possible pitfalls of the technique?
  
  8. You are presented with a group of beef cattle kept in a covered concrete yard and fed a compounded ration. The farmer is concerned that they are showing signs of gradually failing vision and increasingly dilated pupils. Describe your investigations, possible differential diagnoses and likely ocular findings.
  
  9. **List** the neurological tests which are used to evaluate ocular and visual function and outline the neuroanatomical pathways involved.
  
  10. You are presented with a dog for follow-up examination two months after unilateral phacoemulsification. The owner has noticed a white appearance in the pupil and vision appears to have deteriorated to some degree. What are the possible causes of these signs? What steps may be taken to limit these processes?
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THE ROYAL COLLEGE OF VETERINARY SURGEONS

**DIPLOMA IN VETERINARY OPHTHALMOLOGY**

**WEDNESDAY 8 AUGUST 2001**

**PAPER II**

(3 hours)

Candidates are required to answer **FIVE** out of the following **six** questions. Allow 36 minutes per question. The use of simple labelled diagrams, where appropriate, is encouraged.

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*If insufficient time is available to answer a question fully, it will be acceptable to complete in note form.*

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1. You are presented with a horse with a history of unilateral recurrent uveitis. Discuss how you would manage this case and relate your approach to published theories of aetiopathogenesis.
  2. Describe the structure and function of the normal corneal endothelium. How may it become involved in various disease processes?
  3. What are the possible ocular manifestations of feline herpesvirus (FHV-1) infection in an adult cat? Discuss the difficulties which may be encountered in the diagnosis and management of the condition.
  4. What are the clinical manifestations of peri-ocular sarcoids in the horse? Discuss the management options currently available. What are their relative merits and demerits?
  5. How does knowledge of the structure and function of the retina, choroid and optic nerve help our understanding of the fundus changes in cats with systemic hypertensive disease ?
  6. You are asked to investigate widespread cataract formation in a group of farmed Atlantic salmon (*Salmo salar*). Describe your approach and review the information available to help you in your investigations.
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THE ROYAL COLLEGE OF VETERINARY SURGEONS

**DIPLOMA IN VETERINARY OPHTHALMOLOGY**

**TUESDAY 30 JULY 2002**

**PAPER I**

(3 hours)

Candidates are required to answer **ALL TEN** questions on this paper, and only short answers are required.

Allow 18 minutes per question.

The use of simple labelled diagrams where appropriate, is encouraged.

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1. Write **short notes** on the aetiology, diagnosis and differential diagnosis of orbital masses in the cat.
  2. Provide a **brief** overview of the aetiology and diagnosis of equine endophthalmitis.
  3. **Outline** the basic physiology of the normal adult mammalian lens and the pathophysiology of cataract formation.
  4. Compare and contrast, by means of annotated diagrams, the anatomy of the retina in a named vertebrate and a named invertebrate. Add **notes** on the embryology of the retina in the two species you have selected.
  5. Provide a **brief** synopsis of why studies of the eyes in chickens might benefit research on human myopia.
  6. **Briefly** describe the swinging flashlight test and its diagnostic use.
  7. Describe the aetiopathogenesis and management of nasal corneal pigmentation in the Pekingese dog.
  8. **Briefly** describe the importance of the optic fissure during development of the normal mammalian eye, comment on the pathology that may be encountered when embryogenesis is faulty.
  9. **List** the ocular abnormalities that may be encountered in calves exposed to bovine virus diarrhoea (BVD) in utero. Add information on the gestational age in days when such teratogenic insults might occur.
  10. **Illustrate** the anatomy of the pre-ocular tear film in a named mammal. **Outline** the contribution of each tear film component to maintaining the health of the ocular surface. **List** the clinical disorders associated with defects of each tear film component.
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THE ROYAL COLLEGE OF VETERINARY SURGEONS

**DIPLOMA IN VETERINARY OPHTHALMOLOGY**

**TUESDAY 30 JULY 2002**

**PAPER II**

(3 hours)

Candidates are required to answer **FIVE** out of the following **six** questions.

Allow 36 minutes per question.

The use of simple labelled diagrams, where appropriate, is encouraged.

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1. A veterinary surgeon contacts you about cattle belonging to one of his clients. The veterinary surgeon has become increasingly concerned that the New Forest eye he has diagnosed does not appear to be responding to his usual treatment of subconjunctival injections of procaine penicillin, injected beneath the palpebral conjunctiva of the upper eyelid. The farmer keeps both dairy cattle and a beef suckler herd and animals of all ages are involved, with calves most severely affected. There are some 150 cattle and followers on the farm and approximately half of them are showing clinical signs at present. Firstly, how you would investigate this problem. Secondly, if the primary cause is indeed New Forest eye (infectious bovine keratoconjunctivitis) then how you would manage the outbreak?
2. You are presented with an 8-year-old female neutered cat with chronic bilateral conjunctivitis of 3 month's duration. The cat has been treated with a variety of topical preparations since the typical signs of conjunctivitis and mild discomfort first started, of which a 14-day course of topical tetracycline was the most recent. None of the topical preparations has improved the situation and the owner believes that the eyes have actually become more uncomfortable and the conjunctiva more inflamed over the 3-month period. Describe how you would investigate this case and discuss the possible causes.

**P.T.O for questions 3, 4, 5 and 6**

3. A 1-year-old male boxer is referred to you with a history of sudden onset of ocular pain 10 days previously. The referring veterinary surgeon has been treating the dog with topical fusidic acid and atropine 1% and oral antibiotic (cephalexin) and non-steroidal antiinflammatory (carprofen) tablets. Although there is still some discomfort, the eye has improved and it is now possible to visualise a thorn embedded in the anterior lens. Discuss your management of this case with reference to the science that underpins the decisions you make.
  4. One of your farming clients is finding that many of this year's lambs have lower eyelid entropion and he has not had this problem in his sheep before. Given the current economic circumstances of agriculture, describe how you would investigate and manage the problem. Discuss your approach in relation to the published literature and compare the relative merits of the technique that you select to treat affected animals in relation to any other methods that are available.
  5. A 4 year-old female Birman cat presents with a pigmented lesion at the limbus. The owner feels that the lesion has enlarged slowly over the last 12 months. Describe how you would manage this case. Compare the different behaviour patterns of pigmented lesions based on their location in (a) the cat and (b) the dog.
  6. A 6-year-old Palamino mare presents with a unilateral plaque-like lesion involving the third eyelid as well as an area of erosion and inflammation of approximately a quarter the length of the lower eyelid medially. Describe how you would confirm the diagnosis, discuss the management options and indicate which of these you would select. What advice would you give the client with regard to prognosis in this case?
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THE ROYAL COLLEGE OF VETERINARY SURGEONS

**DIPLOMA IN VETERINARY OPHTHALMOLOGY**

**THURSDAY 17 JULY 2003**

**PAPER I**

(3 hours)

Candidates are required to answer **ALL TEN** questions on this paper, and only short answers are required.

Allow 18 minutes per question.

The use of simple labelled diagrams where appropriate, is encouraged.

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1. **List** the ocular features of persistent hyperplastic primary vitreous as it is found in the Staffordshire Bull Terrier.

Use **diagrams** to relate the development of the eye to the abnormal structures that are found. What causes this condition?

2. **Briefly outline** your protocol for conducting a gonioscopic examination in a dog.

What problems may be encountered in:

- (a) performing this examination?  
and,
- (b) interpreting its results?

3. Describe how you would place a subpalpebral lavage system in a young thoroughbred horse.

What difficulties may be experienced in the management of such a system and how can these be overcome?

4. Use **diagrams** to explain the ophthalmoscopic appearance of retinal dysplastic lesions in dogs.

How are such lesions caused?

**P.T.O. for Questions 5, 6, 7, 8, 9 and 10**

5. Describe the clinical appearance, pathogenesis and treatment of:

- a) Internal hordeolum.
- b) External hordeolum.
- (c) Chalazion.

6. **Outline** factors that will influence the prognosis for salvage of vision and globe in the management of traumatic proptosis in canine and feline patients.

*Describe your management of traumatic proptosis in a three year-old Pug and list possible complications.*

7. **Outline** the role of Vitamin E in the maintenance of normal ocular health.

**Briefly** describe the clinical presentation and pathophysiology of ocular conditions associated with Vitamin E hypovitaminosis in the horse and dog.

8. Use **diagrams** to illustrate the local anaesthetic techniques that may assist your examination and treatment of equine ocular disease.

Indicate in each case:

- a) The nerve involved and its distribution.
- b) The site of administration and drug of choice.
- c) The purpose of the procedure.
- d) Possible complications.

9. Compare and contrast Collie eye anomaly and Merle Ocular Dysgenesis. **The use of a table is encouraged.**

**Briefly** describe the events during embryogenesis that occur in dogs affected with Merle Ocular Dysgenesis which result in the clinical presentation of the posterior segment colobomata.

10. You are contracted to provide ophthalmic services to a breeding colony of laboratory rats.

**Outline** the conditions of the eye, orbit and adnexa that you expect to be called to investigate.

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THE ROYAL COLLEGE OF VETERINARY SURGEONS

DIPLOMA IN VETERINARY OPHTHALMOLOGY

THURSDAY 17 JULY 2003

PAPER II

(3 hours)

Candidates are required to answer **FIVE** out of the following **six** questions.

Allow 36 minutes per question.

The use of simple labelled diagrams, where appropriate, is encouraged.

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1. Give a detailed overview of physiologic, pharmacologic and practical considerations for anaesthesia of the canine patient with ocular disease.  
  
**Outline** a protocol including premedication, induction and maintenance of anaesthesia for intracapsular lensectomy in a five year-old JRT and explain your rationale for the choice of drugs used.
  2. You are consulted about a group of 200 ewes, half of which show signs of keratoconjunctivitis.  
  
How would you investigate and manage this outbreak?  
  
What advice would you give to the flock owner?
  3. You are presented with an Appaloosa Stallion which has recently been imported from Florida, USA. The stallion has developed a yellow appearance, approximately 5 mm diameter, in the paracentral right cornea which is associated with intense ocular pain. Slit lamp examination reveals faint fluorescein uptake in the area overlying the well circumscribed lesion as well as mild generalised corneal oedema and marked peripheral corneal vascularisation. Examination of intraocular detail reveals intense flare and miosis. The eye is hypotensive with an IOP reading of 7 mmHg.  
  
Discuss the more common causes for these findings and discuss their pathophysiology in detail.  
  
**Outline** the diagnostic and therapeutic (both medical and surgical) options for the conditions you mention, giving special consideration to the management of each condition.

P.T.O. for Questions 4, 5 and 6

4. Discuss the factors that influence the technique of surgical enucleation in birds.  
Describe your protocol for three methods of enucleation that may be used safely in avian patients.

5. Review the epidemiological, clinical and histopathological features of feline ocular toxoplasmosis. Address the pathogenesis and possible immunopathological mechanisms of feline ocular toxoplasmosis with reference to the increased prevalence of anterior uveitis in cats that are seropositive for *Toxoplasma gondii*.

**List** laboratory tests that may assist specific diagnosis of ocular toxoplasmosis and specify their limitations.

What advice would you give to the pregnant owner of a cat with anterior uveitis regarding the zoonotic implications?

6. The use of viscoelastic and viscodispersive substances has been firmly established in veterinary ophthalmic surgery.

**Outline** and define the physical properties of viscoelastic/viscodispersive substances and characterise the **THREE** main groups of these substances that are used.

Give indications for the use of viscoelastic/viscodispersive substances during ophthalmic and intraocular surgery and indicate your preference for the type of substance used in **each** case.

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THE ROYAL COLLEGE OF VETERINARY SURGEONS

DIPLOMA IN VETERINARY OPHTHALMOLOGY

MONDAY 10 JULY 2006

PAPER I

(3 hours)

Candidates are required to answer **ALL TEN** questions on this paper, and only short answers are required.

Allow 18 minutes per question.

The use of simple labelled diagrams where appropriate, is encouraged.

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1. **With the aid of diagrams**, show the stages in the development and maturation of the mammalian neurosensory retina. At what age is the canine retina structurally and functionally mature?
2. **Make notes** on the structure and function of the tapetum lucidum in the sheep and goat.
3. **Briefly describe** the functional architecture of the visual cortex in the cat.
4. **Briefly describe** the role of *Chlamydophila spp* in ocular diseases of animal species.
5. Name and **briefly describe** the techniques available for surgical reconstruction of the lower eyelid following removal of a tumour involving more than one-half the length of the eyelid.
6. **Describe** the role that herpesvirus infection plays in ocular disease of the horse.
7. **Summarise** the findings of research aimed at elucidating the originating tissue for intraocular sarcoma formation in the cat. How might a cat with this condition present?
8. **Describe** how you would refract a dog. What are the published results of refracting apparently normal dogs? What measurements would be taken to calculate the required power of an intraocular lens to make an animal emmetropic following cataract removal?
9. **Describe, with the aid of a diagram**, the anatomical features of the nasolacrimal duct system in the rabbit. What anatomical relationships can be important for the development of disease processes affecting the nasolacrimal duct system in the rabbit?

10. **Describe** how you could perform electroretinograms that would allow the separate investigation of rod and cone function. Give **TWO** examples of retinal diseases in which the ERG can reveal the presence of specific retinal dysfunction.

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THE ROYAL COLLEGE OF VETERINARY SURGEONS

**DIPLOMA IN VETERINARY OPHTHALMOLOGY**

**MONDAY 10 JULY 2006**

**PAPER II**

(3 hours)

Candidates are required to answer **FIVE** out of the following **six** questions.

Allow 36 minutes per question.

The use of simple labelled diagrams, where appropriate, is encouraged.

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1. **Discuss** how the ocular vasculature can be altered as a result of systemic disease. For **each** condition you mention describe the aetiopathogenesis of the ophthalmoscopic changes.
2. Recurrent corneal erosion (indolent ulcer) is a common and sometimes frustrating clinical problem. **Discuss in detail**, the results of investigations into the aetiopathogenesis of the condition and possible methods of managing it in the dog. How would your approach to manage the condition differ in:
  - a) the cat?

**and**

  - b) the horse?
3. **Discuss** in detail the clinical assessment of, and management of, horses that have suffered trauma to the globe.
4. **Discuss** the short-term and long-term complications that can be associated with cataract surgery in the dog. For **each** complication **discuss** methods of:
  - a) avoiding the complication

**and**

  - b) managing them if they do occur.
5. **Compare and contrast** ocular and adnexal neoplasia in the cat and dog. For **each** neoplasm that you mention include the biological behaviour.

6. **Discuss** the ocular manifestations of toxicities and dietary deficiencies in farm animals.

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THE ROYAL COLLEGE OF VETERINARY SURGEONS

**DIPLOMA IN VETERINARY OPHTHALMOLOGY**

**MONDAY 19 OCTOBER 2009**

**(SPECIAL ARRANGEMENT)**

**PAPER I**

(3 hours)

Candidates are required to answer **ALL TEN** questions on this paper, and only short answers are required.

Allow 18 minutes per question.

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11. **List** the DNA-based tests available for hereditary eye diseases in dogs. For **each** test include the condition and the gene involved.
  
2. What is a visually evoked potential (VEP)? How can it be recorded and how can it be of value in the assessment of a visually impaired patient?
  
3. **Discuss** neuroprotection as a potential treatment for glaucoma.
  
4. **Describe** the types of neoplasm that affect the eyelid of:
  - (a) the cat
  - (b) the rabbit.
  
5. **Compare and contrast** band keratopathy and lipid keratopathy in the dog.
  
6. **List** the various factors in intra-ocular regional immunity.
  
7. **Provide an annotated diagram** of the visual cycle.

**P.T.O. for Questions 8 – 10**

8. **Describe** the mode of action of **each** of the following therapeutic agents:
- a) L-Lysine
  - b) Interferon  $\alpha$  (Interferon alpha)
  - c) Fusidic acid
  - (d) Brinzolamide.
9. **Briefly describe** the venous and lymphatic drainage of the orbit in the dog.
10. **Indicate** the site and function of the following proteins found within the eye:
- a) Melanopsin
  - b) Carbonic anhydrase
  - c) Alpha crystallin
  - d) Retinal guanylate cyclase 1.
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THE ROYAL COLLEGE OF VETERINARY SURGEONS

DIPLOMA IN VETERINARY OPHTHALMOLOGY

**MONDAY 19 OCTOBER 2009**  
**(SPECIAL ARRANGEMENT)**

**PAPER II**

(3 hours)

Candidates are required to answer **FIVE** out of the following **six** questions.

Allow 36 minutes per question.

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1. **Discuss** hereditary glaucoma in dogs. Provide an evidence-based rationale for using gonioscopy as a tool to reduce the incidence of glaucoma in a chosen breed of dog.
  2. **Discuss** abnormalities in pupillary function.
  3. **Discuss** the management of retinal detachment.
  4. **Discuss FOUR** ophthalmic conditions of your choice that affect birds.
  5. **Discuss** ocular and adnexal neoplasia in the ox **and** the horse with respect to tumour type and possible management.
  6. **List and discuss** the viral infections which can cause ocular disease in:
    - a. the ox **and** horse

**OR**

    - b. the dog **and** cat.
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