



*(University of Choice)*

**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS  
2020/ 2021 ACADEMIC YEAR**

**MAIN EXAM**

**FOR THE DEGREE  
OF  
BACHELOR OF OPTOMETRY**

**COURSE CODE:** BOV 422

**COURSE TITLE:** CLINICAL MEDICINE IN OPTOMETRY

**DATE:** 20/04/2022

**TIME:** 8-10AM

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**INSTRUCTIONS TO CANDIDATES**

Answer all questions

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

## SECTION A (50 MARKS)

1. Indications for closure of carotid cavernous sinus fistulas does not include which of the following?

- a. Ophthalmoplegia
- b. Severe headache
- c. Persistent bruit
- d. Progressive proptosis

2. A 25-year-old man is seen in your office 2 months after blunt trauma to the right orbit. The examination is normal except for blepharoptosis on the right side. Levator function is normal on both sides, and the patient states the eyelid positions were equal on both sides prior to the injury. There is no enophthalmos, and the patient does not complain of diplopia. What is the best next step in managing this patient?

- a. Surgical exploration and repair of the levator aponeurosis
- b. Close observation with no plan for surgical correction until 3 to 6 months after initial injury
- c. Computed tomography (CT) scan to rule out an orbital fracture
- d. A Tensilon test to rule out new-onset myasthenia gravis

3. A 61-year-old man presents with a 1-week history of redness and pain of the right eye. He wonders if this is related to his chronic sinus problems. On examination, his visual acuity is 20/20. His right upper eyelid is swollen. The right conjunctiva is injected with dilated episcleral vessels inferiorly. The underlying sclera appears inflamed. His ocular motility is limited, and there is 2 mm of proptosis OD. A CT scan shows a diffuse infiltrate in the right inferior orbit. There is also thickening of the left nasal mucosa. Which of the following tests would be most beneficial in diagnosing this patient's condition?

- a. Serum p-ANCA (antineutrophil cytoplasmic antibodies)
- b. Serum c-ANCA (antineutrophil cytoplasmic antibodies)
- c. Serum ESR (erythrocyte sedimentation rate) and C-reactive protein
- d. Conjunctival culture for bacterial and viral pathogens

4. A 52-year-old nondiabetic woman presented with a 4-day history of right eyelid swelling, conjunctival injection, and pain. She stated that she had awoken that morning with double vision. On examination, her visual acuity was 20/20 with correction. There was no relative afferent pupillary defect. There was a small abduction deficit OD. The right upper eyelid was erythematous and swollen. The conjunctiva was injected and chemotic. Deeper episcleral vessels were also injected. The cornea was clear and the anterior chamber was deep and quiet. The external examination of the left eye was normal. Funduscopic examination was unremarkable OU. There was 2 mm of proptosis OD. You ordered a CT scan of the orbits, which showed diffuse soft tissue infiltrate involving the anterior portion of the right orbit. The nasal mucosa appeared thickened on the left side. The patient was afebrile, and laboratory studies, including CBC with differential, were all normal. After 7 days on oral corticosteroids, the patient shows moderate improvement. She has less pain, and redness and eyelid swelling have decreased. However, the proptosis and diplopia are unchanged. Which of the following is the most appropriate next step in the management of this patient's condition?

- a. Start intravenous corticosteroids
- b. Continue the present treatment for 1 more week
- c. Remove tissue from the right orbit for biopsy
- d. Repeat the CT scan of the orbits

5. A 52-year-old nondiabetic woman presents with a 4-day history of right eyelid swelling, conjunctival injection, and pain. She states that she awoke this morning with double vision. On examination, her visual acuity is 20/20 with correction. There is no relative afferent pupillary defect. There is a small abduction deficit OD. The right upper eyelid is erythematous and swollen. The conjunctiva is injected and chemotic. Deeper episcleral vessels are also injected. The cornea is clear and the anterior chamber is deep and quiet. The external examination of the left eye is normal. Funduscopy examination is unremarkable OU. There is 2 mm of proptosis OD. You order a CT scan of the orbits, which shows a diffuse soft tissue infiltrate involving the anterior portion of the right orbit. The nasal mucosa appears thickened on the left side. The patient is afebrile, and laboratory studies, including CBC with differential, are all normal. Which of the following actions is not appropriate in the management of this patient's condition?

- a. Perform an orbital biopsy
- b. Begin a topical antibiotic/corticosteroid combination
- c. Begin oral prednisone 60 mg/day with follow-up in the morning
- d. Begin oral antibiotics with follow-up in 3 days

6. During a consultation in the emergency room, you are asked to see a patient with noninfected second-degree burns to the eyelids. The emergency room physicians ask what topical medicine should be placed over the burns to prevent scarring. What would the most appropriate response be?

- a. Gentamicin in a water-miscible base
- b. Silver sulfadiazine 1% cream
- c. No topical medications
- d. Hydrocortisone 1% ointment

7. A 30-year-old man is evaluated in the emergency room for trauma to the right orbit. The patient has marked proptosis and an intraocular pressure of 40 mm Hg on the affected side. A CT scan shows intraorbital hemorrhage. Which of the following actions would be the least effective in acutely reducing intraocular pressure?

- a. Lateral canthotomy and cantholysis
- b. Administration of high-dose oral corticosteroids
- c. Administration of topical aqueous suppressants
- d. Administration of intravenous mannitol

8. A 24-year-old man was involved in an automobile accident in which his face struck the dashboard. He denies any loss of consciousness, but says his vision is blurred in the right eye. Visual acuity is 20/30 OD and 20/15 OS. External examination shows periocular swelling and ecchymosis of the right eye. Motility examination shows moderate restriction to up gaze of the right eye and normal versions of the left eye. Biomicroscopy and dilated fundus examinations are normal. What is the most common location of an orbital blowout fracture?

- a. The orbital aspect of the zygoma
- b. The orbital aspect of the maxilla and inferior orbital rim
- c. The orbital floor medial to the infraorbital nerve
- d. The orbital floor lateral to the infraorbital nerve

9. A 56-year-old man complains of an aching sensation around his left eye that has lasted for 6 weeks. The discomfort increases on upgaze. One week ago, he noted blurred vision in the left eye and a low-grade fever. His visual acuity is 20/20 OD and 20/40 OS. The patient has 3 mm of proptosis in the left eye and mild erythema and tenderness around the left eyelid. Results of biomicroscopy and dilated fundus examination are normal. What is the most helpful diagnostic test for this patient?

- a. Complete blood count
- b. Thyroid function tests
- c. CT scan of the orbits
- d. Skull films

10. An obese patient has chronic conjunctivitis with upper eyelids that easily evert. What additional feature of this disorder would you expect to be present?

- a. Tarsal biopsy showing decreased fibrillin
- b. History of hypoglycemia
- c. Follicular conjunctivitis
- d. History of sleep apnea

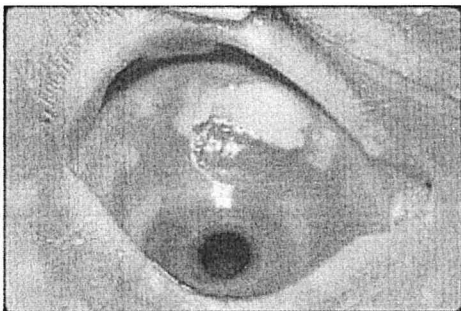
11. A patient has an NLP and painful eye shortly after treatment for chronic endophthalmitis. When evaluating the surgical options, which technique would minimize potential intracranial and orbital contamination?

- a. Enucleation
- b. Evisceration
- c. Subtotal exenteration
- d. Total exenteration

12. A 70-year-old man presents with a 10-day history of tearing, redness, and decreased vision of his right eye. He denies trauma. Slit-lamp examination reveals necrosis of the sclera. This man has a vascular necrosis of his conjunctiva, episclera, and sclera, with signs of acute inflammation. These signs are characteristic of necrotizing scleritis with inflammation. The workup and treatment of the patient should not include which of the following?

- a. Referral to a rheumatologist for treatment with methotrexate or cyclophosphamide
- b. High-dose oral prednisone
- c. Review of systems focused particularly on autoimmune and infectious disorders
- d. Topical corticosteroids

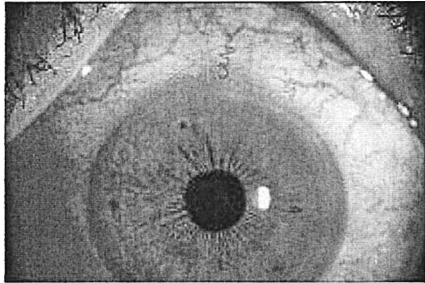
13. A 70-year-old man presents with a 10-day history of tearing, redness, and decreased vision of his right eye. He denies trauma. Slit-lamp examination reveals the findings in the figure. Which one of the following is the most likely diagnosis?



- a. Pseudomonas scleral ulcer
- b. Nodular scleritis

- c. Scleromalacia perforans
- d. Necrotizing scleritis with inflammation

14. A 30-year-old woman presents with a red eye that is tender when she rubs it. The dilated vessels are deep and have a crisscross pattern, as demonstrated in the slit-lamp photograph. The inflamed vessels are not mobile when touched with a cotton-tipped applicator. Examination of the cornea, anterior chamber, and retina are normal, and the patient has no exophthalmos. This is the patient's first episode of a red, painful eye, and a review of systems for autoimmune and infectious diseases is negative. Which one of the following would be the best initial treatment?

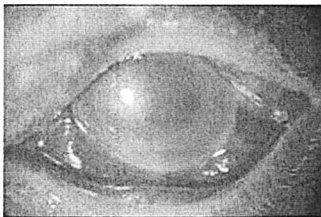


- a. Subconjunctival injection of triamcinolone
- b. High-dose oral prednisone and methotrexate
- c. Topical prednisolone acetate 1%
- d. Oral nonsteroidal anti-inflammatory agents, with meals

15. What is the primary mode of therapy for acne rosacea?

- a. Topical retinoids
- b. Oral tetracycline
- c. Oral corticosteroids
- d. Topical tetracycline ointment

16. A 42-year-old woman was cleaning a milk line on her farm with an undetermined substance. She accidentally splashed the substance into her left eye, resulting in immediate pain, redness, and loss of vision. The eye was immediately flushed with tap water and then, as soon as she arrived in the emergency room, with 2 liters of normal saline. She is later referred for evaluation. The slit-lamp appearance of the eye is shown in the figure. Signs present on examination that point to a poor prognosis would not include which of the following?

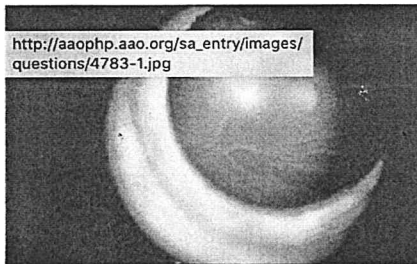


- a. Elevated intraocular pressure
- b. Symblepharon of the lower lid
- c. Corneal edema
- d. Conjunctival erythema

17. Which statement would be least likely regarding the treatment of an alkali burn like the one shown in the above question?

- a. Aids in healing the cornea might include bandage contact lenses, bilateral patching, 10% acetylcysteine, and clear plastic wrap.
- b. Corneal transplantation may be considered 6 to 12 months following injury and only after any eyelid and conjunctival abnormalities are corrected.
- c. Immediate irrigation of the eye with normal saline, lactated Ringer's solution, or tap water is mandatory.
- d. Topical prednisolone should be continued for at least 1 month to ensure inhibition of detrimental inflammatory processes.

18. A 52-year-old man presents for a routine eye examination. He is asymptomatic with a visual acuity of 20/20 OU. The slit-lamp appearance of his left cornea is shown in the figure. What is the most likely cause for this finding?



- a. Topical epinephrine ophthalmic solution
- b. Ochronosis
- c. Chronic active hepatitis
- d. Amiodarone

19. The findings of vertigo and hearing loss are associated with which of the following causes of corneal stromal keratitis?

- a. Varicella zoster virus interstitial keratitis
- b. Syphilitic interstitial keratitis
- c. Herpes simplex virus interstitial keratitis
- d. Cogan syndrome

20. Allergic contact blepharoconjunctivitis is mediated by what immune mechanism?

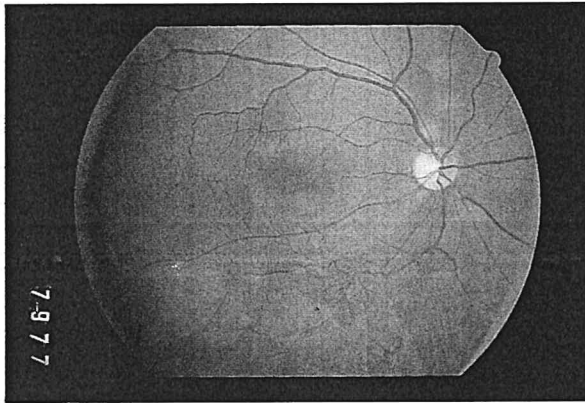
- a. Type I (anaphylactic)
- b. Type II (cytotoxic hypersensitivity)
- c. Type III (immune-complex reaction)
- d. Type IV (delayed hypersensitivity)

21. Three months after the onset of herpes zoster ophthalmicus, a patient developed decreased vision and photophobia in the ipsilateral eye. Examination reveals an intact epithelium, moderate stromal edema, stromal vascularization, and keratic precipitates. What would be the preferred initial topical management?

- a. Vidarabine

- b. Prednisolone acetate
- c. Erythromycin
- d. Trifluridine

22. A 27-year-old man presents with a history of floaters and blurred vision OD. The patient immigrated to the United States from India within the last year, is currently in good health, and denies any history of drug use. Two years ago, while in India, he had a positive tuberculin skin test, and received 9 months of prophylactic isoniazid, rifampin, and ethambutal therapy. Anterior segment examination is normal. The right fundus is shown in the figure. The left fundus showed findings similar to those of the right. Vitreous hemorrhage is noted in the inferior vitreous OD. No pars plana snowbanks are noted in either eye. Which of the following would be least helpful in the workup of this patient?



- a. Serum glucose
- b. Angiotensin-converting enzyme (ACE) and antinuclear antibody (ANA) titers
- c. Hemoglobin electrophoresis
- d. HLA-A29

23. A patient presents with meningismus, vitiligo, and bilateral exudative retinal detachments. What diagnosis is most consistent with these findings?

- a. Herpes simplex uveitis
- b. Human leukocyte antigen (HLA)-B27 uveitis
- c. Vogt-Koyanagi-Harada syndrome
- d. Fuchs heterochromic iridocyclitis

24. A 14-year-old girl complains of a sudden onset of bilateral eye pain and photophobia. On ocular examination she has bilateral anterior uveitis. She has had a fever for two weeks, modest flank and abdominal pain, and weight loss of 10 pounds. Laboratory testing reveals an elevated erythrocyte sedimentation rate at 80 mm/hour, mild elevation of the serum creatinine, and mild proteinuria. What is the most likely diagnosis?

- a. Lyme disease
- b. Toxocara uveitis
- c. Tubulointerstitial nephritis and uveitis
- d. Toxoplasmosis

25. A patient with a bilateral anterior and intermediate uveitis is suspected of having sarcoidosis. There are no conjunctival or lid granulomata. A chest x-ray shows no abnormalities, and serum angiotensin converting enzyme is normal. Which one of the following is the most appropriate examination for pursuing the diagnosis of sarcoidosis?

- a. HLA-B27 status
- b. Biopsy of the conjunctiva
- c. High-resolution CT scan of the chest
- d. Repeat serum angiotensin converting enzyme to rule out laboratory error

26. 23-year-old man presents complaining of floaters in his left eye for 2 weeks. The visual acuity is 20/20 in both eyes. There is a mild (1+) anterior chamber and vitreous reaction, with a small focus of retinitis (less than 1/2 disc diameter) adjacent to a chorio-retinal scar, anterior to the vascular arcades in the left eye. He is HIV negative. He is allergic to sulfa medication. What is the most appropriate next step?

- a. Intravitreal clindamycin and dexamethasone
- b. Oral clindamycin, and after 2 days of therapy, start oral prednisone
- c. Hospitalization for intravenous acyclovir
- d. Observe closely without treatment

27. A 27-year-old man presents with a 2-day history of redness, pain, and photophobia in the left eye. The right eye is normal. His Snellen visual acuity is 20/20 in the right eye and 20/25 in the left. In the left, there is a mild ciliary flush and 3+ cells in the anterior chamber with no keratic precipitates or posterior synechiae. There is no posterior segment inflammation in either eye. What is the most appropriate treatment?

- a. Topical prednisolone acetate 1% 4 times/day, and posterior subtenon injection of 40 mg triamcinolone acetonide
- b. Topical prednisolone acetate 1%, 4 times/day
- c. Hourly prednisolone acetate 1%
- d. Topical prednisolone acetate 1%, 4 times/day and oral prednisone 40 mg with a rapid taper

28. A patient has bilateral diffuse non-necrotizing anterior scleritis. His vision is 20/20 OU and he has normal intraocular pressure. He has no intraocular inflammation, and his evaluation for a systemic disorder is not revealing. Which of the following interventions is the preferred first line therapy?

- a. Flucinolone implant
- b. Intravenous cyclophosphamide
- c. Oral nonsteroidal anti-inflammatory drugs
- d. Topical steroids

29. What is the most common ocular complication of rheumatoid arthritis?

- a. Episcleritis
- b. Keratoconjunctivitis sicca
- c. Scleritis
- d. Recurrent anterior uveitis

30. What laboratory test has the highest predictive value for acute *Bartonella burgdorferi* infection?

- a. Purified protein derivative
- b. Fluorescent treponemal antibody absorption test (FTA-ABS)
- c. Indirect immunofluorescence assay for *Bartonella* immunoglobulin G
- d. Enzyme-linked immunosorbent assay for *Bartonella* immunoglobulin M (IgM)

31. A 29-year-old caucasian woman complains of new floaters in both eyes. She has been camping in the eastern United States and does not remember any tick bites, but does recall a red rash on one leg



followed by bumps on her shins. She denies any sensory or motor neurologic symptoms. In both eyes she has vitritis without any retinal or choroidal lesions. Her chest x-ray and serum angiotensin converting enzyme (ACE) are normal. What is the preferred working diagnosis?

- a. Multiple sclerosis-associated uveitis
- b. Systemic lupus erythematosus
- c. Sarcoidosis
- d. Lyme disease

32. A 32-year-old man with necrotizing scleritis and a history of recent onset sinus disease presents with necrotizing scleritis. On physical examination, there are no other systemic complaints or findings. What laboratory test is most likely to lead to a specific diagnosis?

- a. Serum angiotensin converting enzyme
- b. Serum antineutrophilic cytoplasmic antibodies (ANCA)
- c. Complete blood count
- d. Serum rheumatoid factor and antinuclear antibodies

33. A 36-year-old African-American man presents with uveitis in his left eye. Slit lamp examination demonstrates 2+ anterior chamber cells with 1+ flare and 2 posterior synechiae in the left eye. Numerous anterior vitreous cells also are present just behind the lens. By ophthalmoscopy, no chorioretinal scarring is present. The right eye also has 2 posterior synechiae, but no anterior chamber cells or flare, and there are no anterior vitreous cells or posterior segment abnormalities. How would you classify this uveities episode?

- a. Anterior and intermediate uveitis
- b. Panuveitis
- c. Anterior uveitis
- d. Intermediate uveitis

34. A patient with scleritis is found to have a high titer of antineutrophil cytoplasmic antibodies (ANCA) with a cytoplasmic pattern (c-ANCA). What is the most likely systemic disease associated with these findings?

- a. Polyarteritis nodosa
- b. Systemic lupus erythematosus
- c. Wegener's granulomatosis
- d. Rheumatoid arthritis

35. What is the most common non-ocular finding in Adamantiades-Behcet disease?

- a. Arthritis
- b. Central nervous system vasculitis
- c. Oral or genital ulcers
- d. HLA-B51 positivity

36. A 27-year-old woman has had a sudden onset of a dark area inferior to fixation in the left eye earlier in the day. Examination reveals a visual acuity of 20/20 in each eye and an area of retinal whitening that corresponds to a branch coming from the superotemporal retinal artery. Which of the following is least likely to be associated with this condition?

- a. Evidence of intravenous drug use
- b. A history of migraine

- c. An abnormality demonstrated with carotid Doppler and/or ultrasound imaging techniques
- d. An abnormality detected on cardiac echography

37. According to the Early Treatment Diabetic Retinopathy Study (ETDRS), which of the following clinical findings is not used to determine if a patient has very severe nonproliferative (preproliferative) diabetic retinopathy?

- a. Severe retinal hemorrhages in all four quadrants of the fundus
- b. Cotton-wool patches in all four quadrants
- c. Venous beading in at least two quadrants
- d. Moderately severe intraretinal microvascular abnormalities in at least one quadrant

38. Within several hours of an accident, you see a 23-year-old farmer who injured his right eye while hammering on a bearing. His visual acuity is 20/200 OD and 20/20 OS, and he has a definite relative afferent pupillary defect. His anterior segment is clear, except for some cells and flare in the anterior chamber. A vitreous haze obscures fine details of the posterior pole; however, you see sheathing of some of the peripheral retinal vessels. The management of endophthalmitis in this situation should not include which of the following strategies?

- a. Echography and/or CT scan for identification and localization of an intraocular foreign body
- b. Culture and sensitivities of the intraocular foreign body
- c. Lensectomy and vitrectomy, followed by intravitreal injection of broad-spectrum antibiotics
- d. Intravitreal injection of antibiotics to cover gram-positive and gram-negative organisms

39. 42-year-old woman from Mexico, who has two pet cats, presents with a yellow-white lesion in the macula with overlying vitritis. Adjacent to the lesion is a pigmented retinal scar. Visual acuity in the affected eye is 20/80. What is the most appropriate intervention?

- a. Monotherapy with doxycycline
- b. Oral steroids alone
- c. Monotherapy with leucovorin
- d. Combined therapy with pyrimethamine, sulfadiazine, leucovorin, and oral steroids

40. A 30-year-old woman complains of blurred central vision in the right eye for the past 3 days. Multiple chorioretinal lesions are noted in both eyes. Which of the following findings is most consistent with a diagnosis of acute posterior multifocal placoid pigment epitheliopathy (APMPPE)?

- a. Subretinal hemorrhage in the macula and peripheral scotomas
- b. Subretinal fluid and hemorrhage in the macula, plus vitreous cells
- c. Vitreous cells and satellite lesions
- d. Symptoms in the other eye within 2 days

41. Which of the following tests is the most specific and sensitive for diagnosing an idiopathic macular hole?

- a. Positive Watzke-Allen slit-beam test
- b. B-scan ultrasonography
- c. Optical coherence tomography (OCT)
- d. Fluorescein angiography

42. A patient presents with diabetic macular edema with extensive lipid deposition in the macula. Which of the following laboratory evaluations would be most appropriate?

- a. C-reactive protein
- b. Serum protein electrophoresis
- c. Plasma homocysteine
- d. Plasma lipid profile

43. A 32-year-old woman complains of intermittent diplopia, usually lasting about half an hour when she first wakes up in the morning, with a few months' duration. She also notes some irritation and pressure around her eyes. Acuity, color plates, and visual fields are all normal. Externally, the right upper eyelid is at the upper limbus. The left covers the upper 2 mm of the cornea. There is slight injection OU with some chemosis on the left. Versions are normal, but cover testing demonstrates a small left hypertropia (or right hypotropia) on up gaze. Corneal sensation is normal. Which of the following is the most appropriate next test?

- a. Acetylcholine receptor antibody test
- b. Thyroid function test
- c. FTA-ABS
- d. MRI of the brain

43. A 67-year-old Asian man consulted you 3 months ago with an isolated right sixth-nerve palsy that had been present for 3 months. His CT scan with contrast of the head, edrophonium (Tensilon) test, glucose tolerance test, sedimentation rate, and serologies for Lyme disease and syphilis were normal. He now presents with a left sixth-nerve palsy to accompany the persistent right sixth-nerve palsy. The results of the rest of the examination remain normal. There is no proptosis. A spinal tap performed by his neurologist 1 day earlier was normal. Which of the following is the least important in terms of his management plan?

- a. Perform another spinal tap in a few days
- b. Obtain an otolaryngology consult
- c. Obtain MRI of the base of the brain
- d. Obtain cervical carotid ultrasonography

44. Substernal chest pain in a patient with anterior ischemic optic neuropathy (AION) caused by giant cell arteritis could indicate what condition?

- a. Hepatomegaly
- b. Coronary arteritis
- c. Toxic steroid levels
- d. Referred pain from carotid arteritis

45. An HIV-positive man has bilateral disc swelling, choroiditis and retinal phlebitis. What is the most likely diagnosis for his ocular findings?

- a. Vogt-Koyangi-Harada (VKH) syndrome
- b. Lyme disease
- c. Behcet's disease
- d. Syphilis

46. A patient with temporal arteritis, an elevated elevated sedimentation rate and and abnormal C-reactive protein, Often has what other laboratory abnormality?

- a. Hypercalcemia
  - b. Erythrocytosis
  - c. Elevated angiotensin-converting enzyme
  - d. Thrombocytosis
47. A 35-year-old man with decreased vision OD is found to have optic nerve edema and a macular star. The causative organism most likely is
- a. Onchocerca volvulus
  - b. Bartonella henselae
  - c. Treponema pallidum
  - d. Borrelia burgdorferi
48. Which of the following laboratory tests is most commonly found in JRA-related iritis?
- a. RF-, ANA-
  - b. RF+, ANA-
  - c. RF-, ANA+
  - d. RF+, ANA+
49. Gastrointestinal disorders associated with uveitis include all of the following except
- a. ulcerative colitis
  - b. Whipple's disease
  - c. diverticulitis
  - d. Crohn's disease
50. Anterior vitreous cells are least likely to be found in
- a. retinitis pigmentosa
  - b. CMV
  - c. serpiginous choroidopathy
  - d. chronic cyclitis

**SECTION B (20 MARKS)**

1. Discuss head to toe physical examination (10 marks)
2. Discuss the procedure of sub- conjunctival injection, retrobulbar injection, sub tendon injection, peribulbar injection, intravenous injection (10marks)