Question 1

A 25-year-old man falls while skateboarding and strikes the left side of his head against a concrete retaining wall. On physical examination only a minor scalp abrasion is present at the site of the impact, with minimal bleeding that stops in 3 minutes. He is initially alert following this accident, but then became unconscious 30 minutes later. A head CT scan reveals a convex, lens-shaped area of hemorrhage centered over the left parietal region. These events are most likely to be associated with damage to which of the following parts of the intracranial vasculature?

A Bridging veins

B Cavernous sinus

C Great vein of Galen

D Inferior cerebellar artery

E Middle meningeal artery

F Ophthalmic branch of external carotid artery

Question 2

A 70-year-old man has a 2 day history of worsening generalized headache and increasing obtundation. He now complains of stiffness in his neck. On physical examination vital signs include T 38.7°C, pulse 85/minute, respirations 23/minute, and blood pressure 130/85 mm Hg. A CBC reveals a WBC count of 16,850/microliter. Serum electrolytes include a glucose of 88 mg/dL. A lumbar puncture yields cloudy cerebrospinal fluid with a glucose of 32 mg/dL, protein 146 mg/dL, and cell count of 3800 WBCs (95% PMNs and 5 % mononuclears) and 122 RBCs. He receives antibiotic therapy and improves. Which of the following long-term complications is most likely to develop from this man's current disease?

A Cerebral infarction

B Cerebellar tonsillar herniation

C Encephalitis

D Hydrocephalus

E Subdural hematoma

Question 3

A 6-year-old girl develops visual loss within 3 days of consuming a clear liquid she found in a bottle in her family's garage. On physical examination she has intact motor and sensory function, except for blindness. Poisoning with which of the following substances has most likely occurred?

A Mercury

B Methanol

C Lead

D Iron

E Arsenic

F Organophosphate

Question 4

A 73-year-old man is undergoing radical prostatectomy for prostatic adenocarcinoma. During this procedure the anesthesiologist reports a drop in blood pressure with hypotension that persists for 30 minutes despite intervention with pressor agents. Which of the following pathologic lesions is most likely to occur in his brain as a consequence of this prolonged hypotensive episode?

A Hydranencephaly

B Linear parasagittal infarction

C Lacunar infarcts of basal ganglia

D Parietal lobe hemorrhagic infarction

E Anterior pituitary necrosis

Question 5

A 28-year-old man undergoes induction chemotherapy for acute myelogenous leukemia. A week later he becomes severely pancytopenic, with WBC count of 1320/microliter, Hgb 7.9 g/dL, and platelet count 72,000/microliter. Head CT scan shows a right parietal hemorrhage. MR imaging and angiography reveals a right middle cerebral arterial thrombosis with right parietal hemorrhagic infarction. Which of the following infectious agents is most likely to cause these findings?

A Herpes simplex virus

B Toxoplasma gondii

C Human immunodeficiency virus

D Cytomegalovirus

E Aspergillus flavus

Question 6

A 27-year-old G2 P1 woman gives birth following an uncomplicated pregnancy at 29 weeks gestation to a girl infant. Her prior pregnancy resulted in a normal term birth. She continued to smoke 1 pack of cigarettes per day during the current pregnancy. Following the delivery, the baby receives surfactant therapy and does not develop respiratory distress from hyaline membrane disease. However, the infant has a seizure during the next day of life. Which of the following conditions did this baby most likely develop?

A Intraventricular hemorrhage

B Intracerebellar hemorrhage

C Subdural hematoma

D Subgaleal hemorrhage

E Epidural hematoma

Question 7

Following an episode of severe head trauma incurred in a motorcycle accident, an 18-year-old woman is noted to have decerebrate posturing. Funduscopic examination reveals marked bilateral papilledema. A CT scan of the head reveals marked diffuse cerebral edema from an increase in sodium and water content. There is effacement of lateral ventricles. This edema is most likely to be severest in which of the following parts of the brain?

A Gray matter

B Meninges

C White matter

D Dura

E Ependyma

Question 8

A 32-year-old woman has noted problems with writing for the past month. She has difficulty controlling her hand movements, and the writing is nearly illegible. On examination she has decreased strength in her right upper extremity and decreased light touch sensation over her left lower extremity. She has no decrease in mentation, and there is no reported seizure activity. A lumbar puncture is performed, and the CSF contains elevated levels of IgG, some mononuclear cells, and oligoclonal bands on gel electrophoresis. Which of the following pathologic findings in the CNS is she most likely to have?

A Loss of pigmented neurons in the substantia nigra

B Perivascular lymphocytes with demyelinated axons in white matter

C Increased neurofibrillary tangles and neuritic plaques in the neocortex

D Periventricular lymphoid aggregates with cells marking with CD19

E Foci of multinucleated cells and macrophages in grey and white matter

F Gliosis with atrophy of caudate and putamen

Question 9

A 23-year-old primigravida has noted minimal fetal movement. A fetal ultrasound is performed at 17 weeks gestation and shows an intact fetal cranial vault, mild ventriculomegaly, intact cerebral hemispheres, a "lemon sign" (due to flattened frontal bones), a "banana sign" (due to effacement of the cisterna magna), a normal foramen magnum, and head measurements that are small for gestational age. The maternal serum alpha-fetoprotein is increased. Which of the following fetal congenital abnormalities is most likely to be present in this case?

A Meningocele

B Encephalocele

C Arnold-Chiari II malformation

D Lissencephaly

E Alobar holoprosencephaly

Question 10

A 26-year-old G3 P2 woman has had an uncomplicated pregnancy. A screening ultrasound is performed at 16 weeks gestation, and the findings prompt performance of maternal serum alpha-fetoprotein test, which is elevated. Which of the following abnormalities of the CNS is most likely to be present in this fetus?

A Holoprosencephaly

B Metachromatic leukodystrophy

C Encephalocele

D Germinal matrix hemorrhage

E Spina bifida occulta

Question 11

A 22-year-old primigravida has noted no fetal movement at 18 weeks gestation. Fetal ultrasound examination shows marked hydrops fetalis and organomegaly. There is extensive cerebral necrosis and periventricular calcification. Infection with which of the following organisms is most likely to produce these findings?

A Cytomegalovirus

B Herpes simplex virus

C Human immunodeficiency virus

D Epstein-Barr virus

E Rubeola

Question 12

A 50-year-old African-American man has had headaches for the past month. On physical examination his blood pressure is 182/108 mm Hg. He cannot afford to take any medications. He is admitted to the hospital after suddenly losing consciousness 2 months later. When he is aroused, he cannot speak and he cannot move his right leg. Which of the following intracranial pathologic abnormalities is most likely to be present?

A Middle cerebral artery embolus

B Subfrontal meningioma

C Cerebral venous thrombosis

D Central pontine myelinolysis

E Basal ganglia hemorrhage

Question 13

A 54-year-old woman has 30 year history of alcohol abuse. She has developed more severe and constant motor problems over the past 5 years. Which of the following neurologic findings is she most likely to exhibit?

A Choreiform movements

B Lateral gaze nystagmus

C Gait ataxia

D Tremor at rest

E Hemiparesis

Question 14

A previously healthy 31-year-old woman experiences a sudden severe headache and loses consciousness within an hour. An emergent head CT scan reveals extensive subarachnoid hemorrhage at the base of the brain. She is afebrile. A lumbar puncture yields cerebrospinal fluid with many red blood cells, but no white blood cells. The CSF protein is slightly increased, but the glucose is normal. Which of the following is the most likely diagnosis?

A Acute bacterial meningitis

B Ruptured berry aneurysm

C Progressive multifocal leukoencephalopathy

D Hypertensive hemorrhage

E Amyloid arteriopathy

Question 15

Several members of a large family are affected by the onset of decreasing mental function and motor coordination when they reach middle age. Their extremity movements are marked by choreoathetosis. Genetic testing reveals increased trinucleotide CAG repeats. Which of the following intracranial structures is most likely to appear grossly abnormal with radiologic imaging of these affected persons?

A Caudate nucleus

B Midbrain

C Temporal lobe

D Locus ceruleus

E Spinal cord

Question 16

A 23-year-old man suffers a deep laceration to the forearm. On physical examination there is loss of sensation over the lateral palm, including the thumb and first two fingers of his left hand. Which of the following pathologic changes will most likely result distally in the forearm structure that was injured to produce his physical finding?

A Wallerian degeneration

B Fibrinoid necrosis

C Coagulative necrosis

D Segmental demyelination

E Chronic inflammation

Question 17

A 50-year-old man has been imbibing martinis for 3 hours while at the blackjack table. He wanders off, and 5 minutes later is found down. Paramedics arrive, and discover a bruise on his posterior occiput, but no other signs of trauma. He is transported to the hospital in stable condition, with vital signs showing temperature 36.9°C., pulse 81/minute, respirations 20/minute, and blood pressure 115/80 mm Hg. On arrival, his blood ethanol is 330 mg/dL. He becomes progressively obtunded. His right pupil is 8 mm and the left 4 mm. A head CT scan reveals a collection of blood in the right subdural region. Damage to which of the following intracranial vascular structures has most likely resulted in these findings?

A Middle meningeal artery

B Cavernous sinus

C Middle cerebral artery

D Dural bridging vein

E Great vein of Galen

Question 18

An 11-month-old infant was born at term with no apparent anomalies. The infant has exhibited irritability, vomiting, and loss of appetite for the past 2 months. On physical examination there is macrocephaly with impaired extraocular movements, hypertonia of the lower extremities, and generalized hyperreflexia. A head CT scan reveals bilateral symmetrical ventriculomegaly. Which of the following pathologic abnormalities is most likely to produce these findings?

A Haemophilus influenzae meningitis

B Forking of the cerebral aqueduct

C Epidural hematoma

D Ruptured berry aneurysm

E Metachromatic leukodystrophy

Question 19

A 48-year-old woman has the sudden onset of a severe headache. On physical examination there are no localizing neurologic signs, but she is minimally responsive. A cerebral angiogram demonstrates marked narrowing of cerebral artery branches near the base of the brain, consistent with vasospasm, but no intraparenchymal hemorrhage is present. Laboratory studies show a serum urea nitrogen of 50 mg/dL. An ultrasound scan of the abdomen shows bilaterally enlarged cystic kidneys. Which of the following is the most likely pathologic finding in this woman?

A Acute meningitis

B Severe atherosclerosis

C Arteriolosclerosis

D Cerebral edema

E Subarachnoid hemorrhage

Question 20

A 39-year-old woman with cough and fever for 10 days has had a worsening headache for the past week, along with increasing obtundation. On physical examination her temperature is 38.2°C. A head CT scan reveals a solitary 3 cm diameter mass lesion with ring enhancement located in the right parietal lobe. A stereotactic biopsy is performed and a frozen section shows granulation tissue with adjacent collagenization, gliosis, and edema. Which of the following is the most likely diagnosis?

A Bacterial abscess

B Aspergillosis

C Oligodendroglioma

D Toxoplasmosis

E Thromboembolic infarct

Question 21

A 66-year-old man is finding that he has more difficulty getting up and moving about for the past year. He is annoyed by a tremor in his hands, but the tremor goes away when he performs routine tasks using his hands. His friends remark that he seems more sullen and doesn't smile at them, but only stares with a fixed expression on his face. He has not suffered any loss of mental ability. Which of the following conditions is he most likely to have?

A Amyotrophic lateral sclerosis (ALS)

B Huntington disease

C Parkinson disease

D Niemann-Pick disease

E Tuberous sclerosis

Question 22

A 52-year-old man has had headaches and difficulty concentrating for the past 2 months. He then begins to exhibit odd behavior, including shooting his rifle in his back yard, which the neighbors find disconcerting. He then suffers a grand mal seizure, and is admitted to the hospital. MR imaging of the brain reveals a large mass with extensive necrosis in the left cerebral hemisphere extending across corpus callosum into the right hemisphere. Which of the following neoplasms is he most likely to have?

A Meningioma

B Glioblastoma

C Medulloblastoma

D Metastatic adenocarcinoma

E Pilocytic astrocytoma

Question 23

A 27-year-old man comes to his physician because of recurrent headaches, averaging one episode per week for the past year. He describes a slowly building, dull, aching, band-like pain accompanied by tight neck muscles. The pain lasts for 4 to 10 hours. Exertion does not worsen the headache. On physical examination there are no abnormal findings. Which of the following types of headache is he most likely to have?

A Brain tumor

B Cluster

C Migraine

D Temporomandibular joint dysfunction

E Tension-type

Question 24

A 30-year-old G2 P1 woman delivers a stillborn male infant at 28 weeks gestation. Her previous pregnancy resulted in a normal term birth. At autopsy, the cerebrum of the fetus demonstrates extensive diffuse periventricular areas of necrosis with dystrophic calcifications. Infection in utero with which of the following organisms is most likely to have caused these findings?

A Taenia solium

B Toxoplasma gondii

C Poliovirus

D Candida albicans

E Treponema pallidum

F Group B Streptococcus

Question 25

A 74-year-old man has exhibited memory problems for the past 7 months, and he is noted by his immediate family to confabulate. He dies as a consequence of a hepatocellular carcinoma. At autopsy, his brain demonstrates bilaterally small mamillary bodies that show brown discoloration. Microscopically, there is gliosis and vascular proliferation and hemosiderin deposition in the mamillary bodies and periaqueductal gray matter. Which of the following is the most likely diagnosis?

A Multiple sclerosis

B Parkinson disease

C Amyotrophic lateral sclerosis

D Wernicke-Korsakoff syndrome

E Huntington disease

Question 26

A 50-year-old man was involved in a vehicular accident in which he was not wearing any restraint device and struck his head against the windshield of his van. He did not lose consciousness at that time or at any point thereafter. Physical examination showed a minor contusion to his forehead. However, a month later he begins complaining of headaches, becoming irritable and acting strangely. Which of the following intracranial vascular abnormalities most likely developed in this man?

A Epidural hematoma

B Subdural hematoma

C Cerebral contusions

D Subarachnoid hemorrhage

E Intracerebral hematoma

Question 27

A previously healthy 42-year-old former major league baseball player develops progressive, symmetric muscular weakness of his upper extremities along with fasciculations over the course of 3 years. Then he develops difficulty speaking and swallowing. He does not have myalgias or arthralgias. He remains afebrile. His mental function has not become diminished. Which of the following is his most likely diagnosis?

A Amyotrophic lateral sclerosis

B von Recklinghausen disease

C Multiple sclerosis

D Werdnig-Hoffman disease

E Guillain-Barré syndrome

Question 28

A 20-year-old man has recently been inducted into the army. Four weeks into basic training, he experiences a severe headache for an entire day. He had been healthy prior to this, noting only a mild sore throat the prior day. His vital signs are: T 39.2°C, P 90/minute, RR 24/minute, and BP 110/70 mm Hg. A lumbar puncture is performed and examination of the cerebrospinal fluid shows 2 RBC's/microliter, 4,000 WBC's/microliter, glucose of 20 mg/dL (serum 75 mg/dL), and CSF protein of 105 mg/dL. Which of the following additional laboratory tests on the CSF would be the most helpful for diagnosis in this man?

A Cryptococcal antigen assay

B Acid fast stain

C India ink preparation

D Herpes simplex virus serology

E Gram stain

F VDRL

Question 29

A 14-year-old boy is brought to the emergency room following an accident in which he hit his head against a concrete wall. He was initially unconscious but then "came to" 5 minutes later. However, an hour later in the emergency room, he is comatose, and skull radiograph reveals a linear skull fracture of the temporal-parietal region on the left. Which of the following is the most likely develop in this boy?

A Subdural hematoma

B Epidural hematoma

C Ruptured berry aneurysm

D Cerebral edema with herniation

E Contusion of frontal lobes

F Sagittal sinus thrombosis

Question 30

A 45-year-old man has had a severe, intractable headache for a week. Physical examination reveals papilledema on the right. A head CT scan shows marked right to left midline shift. MR imaging shows a 6 cm enhancing mass lesion in the right parietal region with marked surrounding edema. He then develops a dilated pupil on the right. Which of the following vascular lesions is he most likely to have?

A Superior sagittal sinus thrombosis

B Right cerebellar hemispheric hemorrhage

C Pontine hemorrhages

D Thrombosis of the posterior cerebral artery

E Diffuse subarachnoid hemorrhage

Question 31

A 43-year-old woman develops progressive, ascending motor weakness over the past 4 days. She is afebrile. She is hospitalized and requires intubation with mechanical ventilation. A lumbar puncture is performed and normal opening pressure is noted. The CSF is clear and colorless with glucose of 65 mg/dL (serum 100 mg/dL), protein 95 mg/dL, and cell count 5/microliter, all lymphocytes. She gradually recovers over the next month. Which of the following conditions most likely preceded the onset of her neurologic disease?

A Ketoacidosis

B Viral pneumonia

C Drug allergy

D Systemic lupus erythematosus

E Vitamin B12 deficiency

Question 32

A 50-year-old woman suddenly loses consciousness. On examination in the emergency department, her temperature is 37°C, pulse 79/minute, respirations 18/minute, and blood pressure 160/95 mm Hg. A head CT scan shows a 4 cm area of bright attenuation in the left basal ganglia region. There is effacement of the lateral ventricles and a shift of the midline to the right. Through which of the following mechanisms is death in the patient most likely to occur?

A Cerebellar tonsillar herniation

B Intraventricular hemorrhage

C Widespread metastases

D Dissemination of infection

E Extensive watershed infarction

Question 33

The mother of a 5-year-old girl realizes that her child has spent all of Saturday in bed. The girl is listless and not arousable. At the emergency department the examining nurse practitioner notes a temperature of 38.8°C and nuchal rigidity. A lumbar puncture yields slightly cloudy CSF with a protein of 61 mg/dL and glucose 19 mg/dL (serum glucose 83 mg/dL). A culture of CSF is most likely to yield which of the following organisms?

A Streptococcus pneumoniae

B Cryptococcus neoformans

C Aspergillus fumigatus

D Mycobacterium tuberculosis

E Cytomegalovirus

Question 34

A 46-year-old woman is bothered by tinnitus in her left ear that has progressed over 5 weeks to unilateral hearing loss. On physical examination she has a marked decrease in hearing on the left, with Rinne test indicating air conduction better than bone conduction. The other cranial nerves I - VII and IX - XII are intact. Brain MR imaging reveals a solitary, circumscribed 3 cm mass located in the region of the left cerebellopontine angle. Which of the following statements is most appropriate to tell the patient and her family regarding the course of her disease?

A Survival more than a year is unlikely

B Remissions and exacerbations will occur in coming years

C Other family members should undergo brain MR imaging

D Resection without recurrence is likely

E HIV-1 infection must be treated

Question 35

A 66-year-old man has had general paresis with increasing loss of higher mental functions for the past 3 years. On physical examination he walks with a widened gait, and he has a positive Romberg test. Laboratory studies show that a VDRL is positive on cerebrospinal fluid obtained by lumbar puncture. The CSF protein and glucose are normal, and there is 1 mononuclear cell present. Which of the following pathologic findings is most likely to be present in his spinal cord?

A Anterior horn cell loss

B Hemorrhage

C Plaques of demyelination

D Vacuolar myelopathy

E Dorsal column atrophy

Question 36

A 53-year-old woman has had transient ischemic attacks (TIAs) for 3 years. She then has the sudden onset of a left hemiparesis. Four months later, brain MR imaging shows a 4 cm diameter cystic area in the right frontal-parietal region. Which of the following underlying conditions is she most likely to have?

A Coronary atherosclerosis

B Chronic meningitis

C Alzheimer disease

D Anaplastic astrocytoma

E Cerebral arterial vasculitis

Question 37

A 50-year-old man has a history of falling multiple times over the past 4 years. Today he fell and on examination is noted to have a 2 cm contusion on the scalp at his occiput. Funduscopic examination shows no papilledema. His blood ethanol is 0.29 gm% (290 mg/dL). In which of the following intracranial locations are hemorrhages most likely to be found in this man?

A Putamen

B Gyrus rectus

C Pons

D Thalamus

E Lateral ventricle

Question 38

A 54-year-old woman has noted changes in sensation in her legs for the past 5 months. On physical examination she has a distal, symmetric, primarily sensory polyneuropathy. She also has a non-healing ulceration on the ball of her left foot. She had a myocardial infarction last year but recovered and is doing well following angioplasty. Which of the following laboratory test findings would you most likely expect to be present in this woman?

A CSF protein of 110 mg/dL

B Positive herpes simplex virus serology

C Blood lead of 50 micrograms/dL

D Plasma cobalamin of 5 pg/mL

E Serum glucose of 195 mg/dL

Question 39

A 17-year-old primigravida has a screening fetal ultrasound performed at 19 weeks gestation. Major fetal internal thoracic and abdominal organs are identified, with no major abnormalities. However, one abnormality is detected, but it is considered to have minimal significance for the fetus. Laboratory studies show that the maternal serum alpha-fetoprotein is not elevated. Which of the following neural tube defects is most likely to be present in this fetus?

A Meningocele

B Anencephaly

C Spina bifida occulta

D Meningomyelocele

E Encephalocele

Question 40

A 50-year-old man is noted by his wife to have undergone personality changes over the last year. In the past, he was noted to be obsessive-compulsive, but he became slovenly and now does not appear to take an interest in his work. He has become more forgetful. On physical examination he has frontal release signs and memory loss. He appears unconcerned about his illness. MR imaging of the brain is performed and shows a 3 cm diameter left frontal lobe mass with areas of calcification. Which of the following diagnoses is most likely to be made on microscopic examination of this mass?

A Vascular malformation

B Oligodendroglioma

C Meningioma

D Schwannoma

E Organizing abscess

F Remote infarct

Question 41

A 53-year-old woman has experienced recurring headaches for the past 16 years. These headaches always occur on the right, have a pulsatile quality, and are accompanied by nausea, photophobia, tingling in her left arm, and dizziness. The headache increases in intensity over 6 hours and remains for a day, unless she is able to fall asleep. On physical examination there are no abnormal findings. Which of the following drugs is most likely to be useful in treating her headaches?

A Acetylsalicylic acid

B Carbamazepine

C Oxazepam

D Oxycodone

E Phenytoin

F Sumatriptan

Question 42

A 10-month-old infant is failing to reach developmental milestones. On physical examination there is a prominent 2 cm lumbar meningomyelocele. MR imaging of the brain shows downward extension of the cerebellar vermis and displacement of the medulla from a small posterior fossa into the foramen magnum. There is tenting of the tectum of the midbrain. The cerebral ventricles are enlarged. The spinal cord has hydromyelia. Which of the following is the most likely diagnosis?

A Dandy-Walker malformation

B Viral meningoencephalitis

C Arnold-Chiari malformation

D Maternal folate deficiency

E Werdnig-Hoffman disease

Question 43

A 46-year-old woman has experienced severe headaches, worsening over the past 2 months. She has noted difficulty moving her left arm during the past day. On physical examination papilledema is present, worse on the right. A lumbar puncture is performed, and the CSF reveals a protein of 190 mg/dL, glucose of 68 mg/dL (serum glucose is 100 mg/dL), and a cell count of 5 WBCs/microliter (4 mononuclears and 1 PMN) and 6 RBCs/microliter. Through which of the following mechanisms are these findings most likely to be produced?

A Blockage of lymphatics by metastatic tumor

B Overproduction of cerebrospinal fluid

C Storage disease with neuronal cell loss

D Hyperosmolar coma with diabetes mellitus

E Edema adjacent to a primary neoplasm

Question 44

A 22-year-old man has recently emigrated from Mexico City. He has the sudden onset of a seizure disorder while working as a chef in a restaurant. On physical examination he is afebrile. No papilledema is noted. MR imaging of his brain reveals a 2 cm rounded cyst in the right temporal lobe cortex and another 1.5 cm cyst in the subarachnoid space over the left parietal lobe. Both lesions are non-enhancing. A lumbar puncture yields colorless CSF under normal pressure. The CSF protein and glucose are normal, and there are 5 WBCs/microliter (4 monos, 1 PMN). Which of the following conditions most likely to cause these findings?

A Metastatic adenocarcinoma

B HIV encephalopathy

C Left atrial mural thrombosis

D Cysticercosis

E Hypertension

Question 45

A 32-year-old man has noted episodic headaches for the past 6 years. The headaches occur over a month, and then do not recur from another 2 or 3 months. The headaches begin with periorbital pain on the left that increases in intensity for 5 minutes, then persists for an hour before diminishing. The pain is accompanied by lacrimation, drooping of the right eyelid, nasal congestion, and nausea. Which of the following forms of headache is he most likely to have?

A Brain tumor

B Cluster

C Migraine

D Temporal arteritis

E Tension

Question 46

A 61-year-old man has had a chronic cough for 6 years as a result of smoking 2 packs of cigarettes per day for 45 years. He has noted the onset of headaches over the past 2 weeks. On neurologic exam there are no localizing signs. MR imaging of his brain reveals a solitary 3.5 cm lesion that is located at the grey-white junction in the posterior left frontal lobe. There is no ring enhancement. A stereotactic biopsy of this lesion is performed. Which of the following microscopic appearances is most likely to be present in this biopsy?

A Organizing abscess

B Viral inclusions

C Plaque of demyelination

D Neuronal loss with gliosis

E Metastatic carcinoma

Question 47

A 48-year-old woman has had headaches for the past 4 months. On examination she is afebrile. The only neurologic deficit is loss of cranial nerve I function on the right. A head CT scan shows a 6 cm circumscribed solid mass in the right anterior fossa. What is the most likely cell of origin for this mass?

A Microglial cell

B Neuron

C Neuroblast

D Meningothelial cell

E Breast ductal epithelial cell

Question 48

A 9-year-old boy has had the new onset of headaches for the past 4 months. The headaches are associated with dull pain and seem diffuse, but they are becoming more frequent and prolonged. On physical examination he has no focal neurologic deficits. MR imaging reveals enlargement of the lateral ventricles. There is a 4 cm homogenous, well-circumscribed mass within the fourth ventricle. Which of the following is the most likely diagnosis?

A Astrocytoma

B Choroid plexus papilloma

C Ependymoma

D Meningioma

E Metastatic bronchogenic carcinoma

F Schwannoma

Question 49

A 36-year-old woman has noted increasing numbers of disfiguring nodular masses involving the skin of her trunk and extremities. She has experienced frequent headaches over the past month. On physical examination these 0.5 to 2 cm subcutaneous masses are firm and non-tender. MR imaging of the brain shows an ill-defined 4 cm mass of the right parietal lobe. An abdominal CT scan shows a 3 cm mass involving the left adrenal gland. Laboratory studies show increased urinary free catecholamines. No other family members are affected by these problems. A mutation involving which of the following genes is most likely to be present in this woman?

A APC

B CFTR

C K-RAS

D NF-1

E N-MYC

F TP53

G RB

Question 50

A A 70-year-old man has had increasing difficulty with movement, starting with his feet and ascending to involve legs, trunk, and now arms, over the past 10 days. On physical examination there are variable sensory changes noted. He is afebrile. He does not lose consciousness and remains mentally alert. He becomes ventilator dependent a week after the onset of this illness. A lumbar puncture is performed and the CSF demonstrates a protein of 86 mg/dL, glucose 63 mg/dL (serum 89 mg/dL), and only 3 mononuclear cells/microliter. He gradually recovers over the ensuing 4 weeks. Which of the following conditions most likely preceded the onset of this man's illness?

A Exposure to a toxin

B Recent viral infection

C Severe hypotension

D Bacterial septicemia

E Radiation therapy

Question 51

A 33-year-old HIV-positive woman has had increasing inability to think clearly, with forgetfulness, over the past 3 weeks. She now has trouble doing everyday tasks. She has no history of seizures, headaches, nausea, vomiting, fever, chills or diarrhea. On examination she is oriented to time, place and date. She is indifferent to her surroundings. She is unable to perform calculations and has difficulty in word finding. MR imaging of her brain shows an irregular ring-enhancing lesion involving left frontal lobe white matter. Her CD4 count is 90/microliter. Which of the following is the most likely diagnosis?

A Infarction

B Toxoplasmosis

C Contusion

D Astrocytoma

E Cysticercosis

Question 52

A 28-year-old man swerves to avoid an oncoming vehicle while riding his motorcycle. He falls and rolls along the pavement for 100 m. On physical examination his vital signs include temperature 37°C, pulse 78/minute, respirations 20/minute, and blood pressure 120/80 mm Hg. He has multiple contusions and abrasions involving the skin of his torso and extremities, but none on his head because he was wearing a helmet. He is unconscious. There is no decerebrate posturing. A head CT scan shows no intracranial hemorrhage or edema and no skull fractures. He remains in a persistent vegetative state. Which of the following pathologic findings is most likely to be present?

A Central pontine myelinolysis

B Cerebral venous sinus thrombosis

C Demyelination

D Diffuse axonal injury

E Meningoencephalitis

F Neuronal degeneration

Question 53

A 58-year-old man has an episode of hemoptysis. Over the next week, he becomes progressively obtunded. He has a blood pressure of 110/70 mm Hg, pulse 90/minute, respirations 25/minute, and temperature 36.8°C. A chest x-ray shows a right hilar lung mass. Serum chemistries reveal a sodium of 108 mmol/L, potassium 3.9 mmol/L, chloride 85 mmol/L, and CO2 19 mmol/L. He is given intravenous saline, and the serum sodium is 135 mmol/L two days later. He then becomes comatose. Which of the following lesions is most likely to be found in his brain?

A Metastases to the cerebral hemispheres

B Central pontine myelinolysis

C Multiple watershed infarctions

D Hemorrhages in the basal ganglia

E Periventricular plaques of demyelination

Question 54

A 68-year-old man has experienced periodic headaches for the past 3 years since retiring from his job. He feels the pain over his temple on the right. On physical examination there is tenderness on palpation over his face anterior to his right ear. During the examination he is noted to be grinding his teeth in response to questions. Which of the following conditions is he most likely to have?

A Faulty dentures

B Meningioma

C Migraine

D Temporal arteritis

E Trigeminal neuralgia

Question 55

An 18-month old girl exhibits poor psychomotor development since birth, along with seizures. On examination her muscle strength and tone are poor. Brain MR imaging shows multifocal abnormalities with loss of tissue in periventricular regions of midbrain, pons, thalamus, and hypothalamus. Laboratory studies show plasma lactate of 4.2 mmol/L. Which of the following is the most likely diagnosis?

A Leigh disease

B Cytomegalovirus infection

C Wernicke disease

D Herpes simplex encephalitis

E Metachromatic leukodystrophy