Temple University School of Medicine
Department of Pathology and Laboratory Medicine
Pathology (D305) Examination IV Version 1
December 17, 2009

IMPORTANT: Read the following instructions.

1. Write examination version number in the space of section number on the examination answer sheet.

2. Fill in your name and the last four digits of your Temple identification number on your answer sheet and darken the corresponding circles with a #2 pencil.

3. There are seventy five (75) items (questions) on this examination. There is only one answer to each item. Choose the best correct answer to a question or response to finish the statement of each item.

4. Use a #2 pencil to mark your answers on your answer sheet. Mark your answer right after you chose one. There is no extra time at the end of the examination. The examination time is one and a half hours.

5. Keep your eyes on your own examination paper and answer sheet. Place your own examination paper and answer sheet on your table top and prevent them from being exposed to others.

6. Students are not allowed to bring electronic devices including cell phones or other miscellaneous items to the examination.

7. Proctors are not allowed to explain questions during examination.

C

1. What is the pathogenic mechanism for massive proteinuria in the nephrotic syndrome?

A. Hyperplasia of mesangial cells
B. Infiltration of neutrophils in the glomeruli
C. Increased permeability of the glomerular basement membrane
D. Decreased number of fenestrated endothelial cells
E. Elongation of podocyte foot processes

B

2. What is the pathogenic mechanism for generalized edema in lipoid nephrosis?

A. Increased hydrostatic pressure in the blood vessels
B. Decreased osmotic pressure of the blood
C. Lymphatic obstruction in the kidney
D. Inflammation in the glomeruli
E. Lipid deposition in podocytes

E

3. Which of the following is a prominent clinical manifestation of membranous glomerulonephritis (nephropathy)?

A. Septicemia
B. Hypertension
C. Obesity
D. Systemic congestion
E. Generalized edema

A

4. What is the causative factor for acute proliferative glomerulonephritis?

A. Deposition of immune complexes in glomerular basement membrane
B. Invasion of glomeruli by bacteria
C. Deposition of amyloid in podocytes
D. Malignant hypertension
E. Resorption of toxic substance by glomerular endothelial cells

D

5. What is the characteristic clinical manifestation of IgA nephropathy (Berger disease)?

A. Massive proteinuria
B. Hypoproteinemia
C. Lipiduria
D. Hematuria
E. Hemoptysis

D

6. Which of the following microscopic features characterizes chronic glomerulonephritis?

A. Hyperplasia of podocytes
B. Neutrophilic infiltrate in glomeruli
C. Hypertrophy of tubular cells
D. Scarring and hyalinization of glomeruli
E. Fatty change of mesangial cells

E

7. Pyuria and bacteriuria are common findings in which of the following?

A. Acute proliferative glomerulonephritis
B. Chronic glomerulonephritis
C. Berger disease
D. Chronic pyelonephritis
E. Acute pyelonephritis

B

8. In toxic acute tubular necrosis, which portion of the nephron is most prominently affected?

A. The glomeruli
B. The proximal convoluted tubules
C. The loop of Henle
D. The distal convoluted tubules
E. The collecting tubules

C

9. A 58-year-old woman with nephrosclerosis dies from a cerebral infarction. This patient most likely had which of the following medical history?

A. Rash
B. Hemoptysis
C. Hypertension
D. Lens dislocation
E. Pharyngitis

A

10. Histology of benign nephrosclerosis shows what kind of characteristic change in the arterioles?

A. Homogeneous hyaline thickening of the arteriolar wall
B. Fibrinoid necrosis and inflammatory cells in the arteriolar wall
C. Atherosclerosis in efferent arterioles
D. Proliferation of intimal cells in the arteriolar wall
E. Aneurysm formation in afferent arterioles

A

11. Adult polycystic kidney disease is due to mutation of either PKD1 or PKD2 gene. It is transmitted by which hereditary pattern?

A. Autosomal dominant
B. Autosomal recessive
C. Co-dominant
D. X-linked dominant
E. X-linked recessive

C

12. Which of the following conditions increases the risk of urolithiasis?

A. Hypocalcemia
B. Neutral urine pH value
C. Hypercalciuria
D. Decreased urinary concentration of mucoproteins
E. Polyuria

D

13. What is the most common cause of hydronephrosis in adult males?

A. Atresia of the urethra
B. Urinary stones
C. Prostate carcinoma
D. Benign prostate hypertrophy
E. Vesicoureteral valve defect

B

14. What is a common complication of mumps parotitis in postpubertal males?

A. Prostatitis
B. Orchitis
C. Urethritis
D. Cystitis
E. Pyelonephritis

E

15. Which of the following tumors is most radiosensitive?

A. Wilms tumor
B. Prostate adenocarcinoma
C. Renal cell carcinoma
D. Transitional cell carcinoma
E. Seminoma

C

16. A somatotroph (eosinophil) adenoma in the pituitary gland of a 10-year-old boy most likely causes which of the following?

A. Infertility
B. Myxedema
C. Gigantism
D. Diabetes insipidus
E. Albinism

D

17. A 23-year-old man has experienced headaches, polyuria, and visual problems for the past 3 months. CT scan shows a large, partially calcified mass in the sellar and suprasellar areas. Histology shows squamous epithelial elements resembling enamel organs. What most likely is this lesion?

A. Corticotroph (basophil) adenoma
B. Prolectinoma
C. Thyrotroph adenoma
D. Craniopharyngioma
E. Gonadotroph adenoma

E

18. What is the etiology of Graves disease?

A. Viral infection in the posterior pituitary gland
B. Ischemic necrosis of the anterior pituitary gland
C. Excess dietary iodine
D. A thyrotroph adenoma
E. Autoantibodies stimulate thyroid-stimulating-hormone receptors

B

19. A 50-year-old woman has experienced cold intolerance and developed myxedema in the face, tongue, and vocal cord. What is the most likely laboratory finding?

A. Increased blood levels of urea nitrogen
B. Decreased blood levels of thyroxine
C. Increased blood levels of sodium
D. Increased blood levels of protein
E. Decreased blood levels of amylase

A

20. The thyroid gland is enlarged in a patient with Hashimoto thyroiditis (disease). This enlargement is most often caused by which of the following?

A. Diffuse infiltration by lymphocytes and plasma cells
B. Accumulation of colloid substance in thyroid follicles
C. Diffuse hyperplasia and hypertrophy of the thyroid gland
D. A toxic adenoma in the thyroid gland
E. A functional papillary carcinoma in the thyroid gland

B

21. What is the most common endogenous cause for Cushing syndrome?

A. An adrenocortical adenoma
B. An ACTH-producing adenoma in the pituitary gland
C. A small cell carcinoma of the lung
D. A pheochromocytoma
E. A pancreatic carcinoma

E

22. Which of the following is a common finding in a patient with Cushing syndrome?

A. Thin body trunk
B. Hypoglycemia
C. Accelerated wound healing
D. Osteosclerosis
E. Candidiasis in the mouth

A

23. Hyperaldosteronism most often causes which of the following?

A. Hypertension
B. Precocious puberty
C. Hyperglycemia
D. Increased muscle tonicity
E. Virilization

C

24. Melanin hyperpigmentation of the skin and the oral mucosa in Addison disease is caused by which of the following?

A. Excess growth hormone
B. Deficient thyroid stimulating hormone
C. Excess ACTH
D. Insufficient testosterone
E. Excess cortisol

D

25. What is the oral manifestation in multiple endocrine neoplasia syndrome 2B?

A. Multiple osteomas in the mandible
B. Multiple keratocysts in the jaws
C. Multiple impacted teeth
D. Multiple neuromas in the oral mucosa
E. Multiple melanin pigmented patches on the lips

D

26. Histology of the islets of Langerhans of the pancreas in type 1 diabetes most frequently shows which of the following?

A. Amyloid deposits
B. Hyperplasia of beta cells with neutrophil infiltration
C. Neovascularization
D. Destruction of beta cells with lymphocytic infiltration
E. Microaneurysms with hemorrhage

E

27. In comparison of type 1 diabetes with type 2 diabetes, which of the following occurs commonly in type 1 but rarely in type 2?

A. Increased blood insulin
B. Hyperglycemia
C. Glucosuria
D. Polyuria
E. Ketoacidosis

C

28. What is the unique histology in the kidney of diabetic patients?

A. Coagulative tubular necrosis
B. Amyloid deposition in glomeruli
C. Kimmelstiel-Wilson lesion
D. Proliferative glomerulonephritis
E. Necrotizing papillitis

B

29. What is the most common cause for secondary hyperparathyroidism?

A. Right heart failure
B. Chronic renal failure
C. Liver cirrhosis
D. Pulmonary tuberculosis
E. Secondary cancers in the bone

A

30. Histology of an osteolytic lesion resulting from hyperparathyroidism most likely shows which of the following?

A. Giant cell granuloma
B. Fibrous scar tissue
C. Osteosarcoma
D. Epidermoid cyst
E. Chondrosarcoma

B

31. A 29-year-old man has had hyperparakeratotic lesions with silver-white scales affecting the skin of the elbows, knees, scalp, lumbosacral areas, and penis. He also has arthritis. Which of the following would most likely be present in this patient?

A. Hypertension
B. Nail abnormality
C. Macrodontia
D. Colon polyps
E. Ventricular septal defect

A

32. What is the most important causative factor for malignant melanoma?

A. Ultraviolet light
B. Pre-existing nevus
C. Germ-line mutation in the CDKN2A gene
D. Chemical carcinogens
E. Vitamin A deficiency

C

33. A 35-year-old man develops a cluster of small vesicles on his forehead. Histology shows subepithelial blisters right above connective tissue papillae with IgA deposition at the tips. Laboratory studies show serum anti-gliadin antibodies. What is the diagnosis?

A. Bullous pemphigoid
B. Contact dermatitis
C. Dermatitis herpetiformis
D. Erythema multiforme
E. Lichen planus

E

34. Microscopic examination of a keratotic lesion removed from the right facial skin of a 58-year-old woman shows mild epithelial dysplasia and hyperparakeratosis. The underlying connective tissue shows solar elastosis. What is the most likely diagnosis?

A. Lichen planus
B. Psoriasis
C. Seborrheic keratosis
D. Dysplastic nevus
E. Actinic keratosis

D

35. In bullous pemphigoid, where are the blisters located?

A. Subcorneal
B. Intraepithelial
C. Suprabasal
D. Subepithelial
E. Interstitial

B

36. Microscopic examination of white, reticulated areas on the buccal mucosa of a 39-year-old woman reveals a band-like infiltrate of lymphocytes at the dermal-epidermal junction as well as degeneration of basal keratinocytes. What is the most likely diagnosis?

A. Benign mucous membrane pemphigoid
B. Lichen planus
C. Basal cell carcinoma
D. Mucosal lymphoma
E. Pemphigus vulgaris

C

37. What is the etiology of verruca vulgaris?

A. Ultraviolet light
B. Coal tar
C. Human papilloma virus types 1, 2, 4, and 7
D. Toxic substance, e.g. poison ivy
E. Staphylococcal infection

A

38. A man develops hives or urticaria when he eats nuts. Which sensitized cell releases a mediator that produces the skin lesion?

A. Mast cell
B. Neutrophil
C. Natural killer cell
D. CD4 lymphocyte
E. Plasma cell

D

39. Microscopic examination of a pearly nodule on the upper lip skin of a 68-year-old man shows infiltrating, irregular islands of basaloid epithelial cells with no keratin formation. Peripheral cells are palisaded. What is the most likely diagnosis?

A. Squamous cell carcinoma
B. Malignant melanoma
C. Seborrheic keratosis
D. Basal cell carcinoma
E. Nevocellular nevus

E

40. Histology of a circular, flat, uniformly pigmented skin lesion shows clusters of benign melanocytes scattered at the dermal-epidermal junction. What is the diagnosis?

A. Café au lait spot
B. Melanoma
C. Seborrheic keratosis
D. Pigmented basal cell carcinoma
E. Junctional nevus

B

41. The endemic form of meningitis is usually caused by which of the following?

A. Herpes simplex virus type 1
B. Neisseria meningitides
C. Staphylococcus pyogenes
D. Taxoplasma gondii
E. Mycobacterium tuberculosis

A

42. Which of the following is a classical inflammatory pattern in viral encephalitis?

A. Perivascular infiltrates of lymphocytes and plasma cells
B. Numerous neutrophils with abscess formation
C. Granulomatous inflammation with central caseous necrosis
D. Granulomatous inflammation with no central necrosis
E. Fibrinoid inflammation with prominent edema

A

43. Prion disease is characterized by what kind of change in the brain tissue?

A. Vacuolation in neurons and neuropils
B. Demyelination
C. Formation of neuritic plagues
D. Hyperplasia of neurons
E. Prominent nuclear inclusion bodies

E

44. What is the most common primary tumor in the central nervous system?

A. Meningioma
B. Ewing sarcoma
C. Oligodendroglioma
D. Ependymoma
E. Astrocytoma

C

45. Which of the following tumors occurs specifically in the anterior maxilla during infancy?

A. Ewing sarcoma
B. Wilms tumor
C. Lymphoma
D. Rhabdomyosarcoma
E. Melanotic neuroectodermal tumor

C

46. Which of the following is characterized by degeneration and depigmentation of the dopamine-secreting neurons of the substantia nigra and the locus ceruleus?

A. Spongiform encephalitis
B. Multiple sclerosis
C. Parkinson disease
D. Alzheimer disease
E. Huntington disease

C

47. Fasciculations of small muscles in Lou Gehrig disease are related to degeneration of which of the following?

A. Upper motor neurons
B. Upper sensory neurons
C. Lower motor neurons
D. Neurons in the hypothalamus
E. Peripheral sensory nerves

D

48. Which of the following is a hereditary disease of CAG repeat mutation with its severity amplified during spermatogenesis?

A. Lou Gehrig disease
B. Alzheimer disease
C. Parkinson disease
D. Huntington disease
E. Multiple sclerosis

D

49. Which of the following is characterized by demyelination in the brain and spinal cord?

A. Streptococcal meningitis
B. Huntington disease
C. Alzheimer disease
D. Multiple sclerosis
E. Creutzfeldt-Jacob disease

B

50. What is the most characteristic clinical feature of Alzheimer disease?

A. Pill-rolling tremor
B. Progressive dementia
C. Choreiform movement
D. Progressive spasticity
E. Visual disturbances

51. A 17-year-old male presents to his dentist with a carious tooth #19. A periapical radiograph is taken to rule out periapical pathology and it is discovered that the bone of the mandible is very dense, making it difficult to visualize the tooth roots completely. Further radiographic studies reveal all bones exhibit the same high degree of radiopacity with corresponding decrease in marrow space. His father was told he had "dense bones" and had died prematurely due to pneumonia. Which of the following diseases does this young man most likely have?

A. Primary osteoporosis
B. Osteomalacia
C. Osteogenesis imperfecta
D. Osteosarcoma
E. Osteopetrosis

52. A 71-year-old woman has a biopsy of her right arm that includes bone from the humerus. Microscopically, the bone consists of a thin cortical plate and thin, widely-spaced trabeculae. She has not been treated with hormone replacement therapy, bisphosphonates or calcitonin. Which of the following is she most at risk for?

A. Osteosarcoma
B. Paget disease of bone
C. Fracture of the head of the femur or pelvis
D. Rickets
E. Ewing sarcoma

53. An athletic 17-year-old male complains of pain and swelling of the femur just above the knee. He is advised to stop his daily activities in sports and let the area heal. However, the pain persists and the swelling appears to be increasing. A radiograph of the area shows destruction of the cortex of the femur in the area and a mass adjacent to the bone. The lesion has a "sunburst" pattern of radiopacity at the periphery. Which of the following is the most likely diagnosis?

A. Osteomalacia
B. Rickets
C. Osteosarcoma
D. Paget disease of bone
E. Osteogenesis imperfecta.

A

54. A 21-year-old male has a bony hard swelling of the right maxilla. A biopsy reveals no normal bone; it was replaced by fibrous tissue containing small, irregularly shaped, isolated bone trabeculae. Studies reveal a defect in the GNAS-1 gene. He most likely has:

A. fibrous dysplasia.
B. rickets.
C. osteopetrosis.
D. osteomyelitis.
E. achondroplasia.

B

55. A radiolucency is present in the mandible of a 32-year-old woman that does not appear to be associated with the teeth. A biopsy is taken and reveals large numbers of multinucleated giant cells, some fibroblasts and extravasated blood. The giant cells resemble osteoclasts. Which of the following is the most likely diagnosis?

A. Osteomalacia
B. Hyperparathyroidism
C. Paget disease of bone
D. Osteogenesis imperfecta
E. Chondrosarcoma

D

56. Hereditary opalescent dentin is most likely to be found in patients with:

A. osteopetrosis.
B. osteoporosis.
C. osteomalacia.
D. osteogenesis imperfecta.
E. osteosarcoma.

C

57. A 62-year-old man has been experiencing great pain in the terminal joint of his left index finger. Histologic examination reveals the presence of a tophus. Which of the following is the underlying cause of this disease?

A. A complete lack of the protein, dystrophin
B. Autoantibodies to endochondral cartilage
C. Uric acid crystals in the joint tissues
D. A specific translocation involving the chromosome bearing the EWS gene
E. Very high levels of serum alkaline phosphatase

58. A 43-year-old woman has had increasing problems with her eyes in that she experiences double vision and her eyelids droop, particularly noticeable later in the day. More recently her speech has become slurred as well. Physical examination reveals a nodular mass in the midline of the neck diagnosed as a thymoma. Which of the following treatments should prove most useful in decreasing her problems with vision and speech?

A. A kidney transplant
B. Supplements of vitamin D
C. A prolonged regimen of chemotherapy
D. High doses of acetylcholine
E. Surgical excision of her thymoma

59. Duchenne muscular dystrophy is due to the lack of production of which of the following proteins?

A. Dystrophin
B. Fibronectin
C. Laminin
D. Actin
E. Myosin

60. Which of the following is not a neoplasm?

A. Leiomyoma
B. Fibrosarcoma
C. Rhabdomyosarcoma
D. Nodular fasciitis
E. Lipoma

61. Condyloma acuminatum is typically caused by which of the following types (strains) of human papillomavirus?

A. Types 2 and 4
B. Types 6 and 11
C. Types 13 and 45
D. Types 16 and 18
E. Types 17 and 19

62. Lichen simplex chronicus:

A. presents clinically as a leukoplakia of the vulva.
B. is the most important precursor of squamous cell carcinoma of the vulva.
C. is the name given to HPV infection of the vagina.
D. is caused by candidal infection.
E. is characterized by epithelial atrophy and progressive fibrosis.

D

63. The most common infectious cause of cervicitis is:

A. *Trichomonas vaginalis.*
B. *N. gonorrheae.*
C. Herpes simplex virus type 2.
D. *Chlamydia trachomatis.*
E. *Candida albicans.*

B

64. Cervical intraepithelial neoplasia:

A. progresses to squamous cell carcinoma within 10 years in all women.
B. is the setting in which almost all cases of cervical squamous cell carcinoma develop.
C. is most closely associated with human papillomavirus strains 6 and 11.
D. has a peak incidence at 65 years of age.
E. is undetectable by Pap smear.

B

65. Human papillomavirus strains that pose a high risk for cervical dysplasia:

A. are typically transmitted by airborne droplets caused by coughing.
B. integrate their DNA into the host genome.
C. maintain their DNA as episomal, separate from the host DNA.
D. typically cause condyloma acuminatum.
E. cause only 10-20% of cases of cervical carcinoma.

E

66. A 31-year-old woman has been experiencing lower pelvic pain as well as some chest pain, that occurs simultaneously with her menstrual period. A biopsy of peritoneal tissue reveals normal, functional endometrial tissue. This woman is suffering from:

A. endometrial carcinoma, type II.
B. ectopic pregnancy.
C. pelvic inflammatory disease.
D. cervical carcinoma.
E. endometriosis.

C

67. Abnormal endometrial bleeding in the absence of a well-defined organic lesion is best called:

A. menorrhagia.
B. metrorrhagia.
C. dysfunctional uterine bleeding.
D. dysmenorrhea.
E. endometritis.

A

68. Prolonged excesses of estrogen over progesterone can lead to various forms of endometrial hyperplasia:

A. the more atypical forms serving as precursors for endometrial carcinoma.
B. that are all benign.
C. that can be easily reversed by prolonged high doses of progesterone.
D. that only give rise to menorrhagia during a woman's reproductive years.
E. that serves as precursor lesions for development of leiomyomas.

D

69. Endometrial carcinomas arising from dysplastic, atrophic endometrial lining:

A. are less aggressive than endometrioid carcinomas.
B. histologically resemble endometrial tissue.
C. arise most commonly in women less than 40 years of age.
D. are high grade and aggressive "serous" carcinomas.
E. share the same genetic mutations as endometrioid carcinomas.

B

70. Patients with inherited mutations in BRCA genes:

A. have increased risk for development of breast carcinoma only.
B. have increased risk for development of breast and ovarian carcinoma.
C. have increased risk for development of ovarian carcinoma only.
D. have increased risk for development of breast carcinoma and decreased risk for development of ovarian carcinoma.
E. have increased risk for development of cervical carcinoma only.

C

71. The rupture of large mucinous ovarian tumors into the peritoneal cavity with continued growth of the tumor cells gives rise to:

A. endometriosis.
B. pelvic inflammatory disease.
C. pseudomyxoma peritonei.
D. extensive fibrous adhesions.
E. irritable bowel syndrome.

D

72. A complete hydatiform mole:

A. is usually triploid (69,XXY).
B. arises from 2 spermatozoa fertilizing a normal egg.
C. has some normal chorionic villi.
D. does not permit embryogenesis.
E. is typically discovered after 8 months of assumed pregnancy.

B

73. The underlying cause of preeclampsia and eclampsia is:

A. the presence of a partial hydatiform mole.
B. failure of placental spiral artery smooth muscle to be replaced by fibrinous material.
C. ectopic pregnancy.
D. convulsions.
E. glomerulonephritis.

E

74. A 55-year-old woman presents with a palpable, non-tender, 3 cm, fixed, nodule in the upper, outer quadrant of her right breast. She also has palpable lymph nodes in her axilla and has lymphedema of her right arm. She feels fine otherwise. This woman most likely has:

A. colon carcinoma that has metastasized to her breast.
B. an abscess in her breast caused by *Staphylococcus aureus*.
C. non-Hodgkins lymphoma of her axillary lymph nodes.
D. a fibroadenoma of the right breast.
E. scirrhous carcinoma of the breast.

C

75. A 64-year-old man with end-stage liver cirrhosis has decreased ability to metabolize nutrients, hormones, etc. Among other problems, he is at risk for development of:

A. osteopetrosis.
B. osteogenesis imperfecta.
C. gynecomastia.
D. rickets.
E. gonadal choriocarcinoma.