МИНИСТЕРСТВО НАУКИ, ВЫСШЕГО ОБРАЗОВАНИЯ И ИННОВАЦИЙ КЫРГЫЗСКОЙ РЕСПУБЛИКИ
ОШСКИЙ МЕЖДУНАРОДНЫЙ МЕДИЦИНСКИЙ УНИВЕРСИТЕТ

Кафедра «Естественно-гуманитарных дисциплин»

РАССМОТРЕНО
на заседании кафедры протокол № 2
от «05» 09 **2025 года**

Зав. кафедрой, _____ **Р.О.Юсупова**

УТВЕРЖДАЮ_____

Председатель УМС ОММУ,
к.б.н., доцент _____**Орунбаева Б.М.**
“ 22 ” 09 **2025 г.**

ФОНД ТЕСТОВЫХ ЗАДАНИЙ

для итогового контроля по дисциплине «Pathology»
на 2025-2026 учебный год
Направление: 560001 – Лечебное дело (GM)
курс – II, семестр – III

Наименование дисциплины	Всего	Кредит	Аудиторные занятия (60 ч)		СРС
			Лекции	Практические	
Патология	**150 ч**	**5 кр**	**30 ч**	**45 ч**	**75 ч**
Количество тестовых вопросов	**350**				

Составитель: _____Осмонбекова Г.М.

Эксперт-тестолог: _____ Токтоназарова Н.Т.

г. Ош – 2025 г.

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ БАНКА ТЕСТОВЫХ ЗАДАНИЙ

кафедры « Естественно-гуманитарных дисциплин »

от «___» _____20__г.

на разработанные тестовые задания по дисциплине

“ Психология ”

наименование дисциплины

Осмонбекова Г.М.

/указать должность, ученую степень, Ф.И.О. автора (авторов)/

Тестовые задания проверены членом экспертной группы тестологов

Токтоназарова Н.М.

/указать должность, ученую степень, Ф.И.О./

Направления проведения оценки структуры и содержания тестового задания

№	Направление экспертизы	Оценка экспертов	
1.	Соответствие задания программам и стандартам обучения	Соответствует	Не соответствует
2.	Включение в тесты только наиболее важных, базовых знаний	Соответствует ✓	Не соответствует
3.	Ясность смысла тестовой ситуации и представления ТЗ	Ясно ✓	Не ясно
4.	Правильность ответа на вопрос ТЗ	Соответствует ✓	Не соответствует
5.	Значимость содежания тестового задания (0-сомнительный, 1-допустимый, 2-важный, 3-существенный)	2 балл(ов)	
6.	Соответствие необходимое число заданий по каждому разделу дисциплины исходя из его важности и числа часов, отведенных на его изучение в программе.	Соответствует ✓	Не соответствует

Членом экспертной группы выявлены следующие недостатки в тестовом задании 15 тестовых вопросов несоответствует по тематике

Членом экспертной группы внесены следующие исправления (корректировки) в тестовое задание после обсуждения заменение 15 тестовых вопросов.

На основании представления тестовых заданий автором (авторами) и проведенной проверки сделала следующее заключение:

1) Содержание тестовых заданий **соответствует (не соответствует)** содержанию УМКД (*нужное подчеркнуть*)

2) Представленные тестовые задания в следующем объеме 350 вопросов:

соответствуют (не соответствуют) требованиям, предъявляемым к количеству, уровням сложности и формам заданий для составления тестов. (*нужное подчеркнуть*)

Тестолог: Токтоназарова Н.М. _____

Ознакомлен зав. кафедрой Жунова Р.О. _____

Фонд оценки знаний по предмету Патология1
Assessment Materials for the Discipline "Pathology 1"
(2nd Year Students 3rd semester)

Pathology – Cell Injury and Necrosis

Questions:

1. What is the first change in cell injury?
2. Which is the first morphological change in cell injury?
3. What is the composition of myelin figures?
4. What is the composition of amorphous flocculent densities?
5. The injury with which the amorphous flocculent densities are associated?
6. What are the three stages of nuclear change in cell injury?
7. What is the most common type of necrosis?
8. Which are the most common organs affected by coagulative necrosis?
9. Which necrosis happens inside the pancreas?
10. Which necrosis happens around the pancreas?
11. Zenker's degeneration is seen in which skeletal muscles?

Answers:

1. Mitochondrial dysfunction
2. Cellular swelling (hydropic change)
3. Primarily composed of phospholipids with a minor presence of calcium
4. Calcium
5. Irreversible cell injury
6. Pyknosis+Karyorrhexis+Karyolysis
7. Coagulative necrosis
8. Heart
9. Liquefactive necrosis
10. Fat necrosis
11. Rectus abdominis muscle + Diaphragmatic muscle

Multiple Choice Questions (MCQs):

Pathology – Cell Injury and Necrosis

1. What is the earliest biochemical change in cell injury?
A. Nuclear fragmentation
B. Ribosome detachment
C. Mitochondrial dysfunction
D. Cell membrane rupture

2. What is the earliest morphological change seen in reversible cell injury?
A. Nuclear pyknosis
B. Cellular swelling (hydropic change)
C. Fatty change
D. Plasma membrane rupture

3. Myelin figures seen in cell injury are primarily composed of:
A. Proteins and cholesterol
B. Phospholipids with a small amount of calcium
C. Glycogen granules
D. DNA fragments

4. Amorphous flocculent densities seen in mitochondria are mainly composed of:
A. Sodium
B. Potassium
C. Magnesium
D. Calcium

5. Amorphous flocculent densities are associated with:
A. Reversible cell injury
B. Apoptosis
C. Adaptive cellular response
D. Irreversible cell injury

6. Which of the following represents the correct sequence of nuclear changes in irreversible cell injury?
A. Karyolysis → Pyknosis → Karyorrhexis
B. Pyknosis → Karyorrhexis → Karyolysis
C. Pyknosis → Karyolysis → Karyorrhexis
D. Karyorrhexis → Karyolysis → Pyknosis

7. What is the most common type of necrosis encountered in clinical practice?
A. Liquefactive necrosis
B. Fat necrosis
C. Caseous necrosis
D. Coagulative necrosis

8. Coagulative necrosis most commonly affects which organ?
A. Brain
B. Liver
C. Heart
D. Pancreas

9. Which type of necrosis typically occurs inside the pancreas?
A. Coagulative necrosis
B. Caseous necrosis
C. Liquefactive necrosis
D. Gangrenous necrosis

10. Which type of necrosis commonly occurs around the pancreas in acute pancreatitis?
A. Liquefactive necrosis
B. Fat necrosis
C. Coagulative necrosis
D. Caseous necrosis

11. Zenker’s degeneration is most commonly seen in which skeletal muscles?
A. Quadriceps femoris
B. Deltoid muscle

C. Rectus abdominis and diaphragmatic muscles
D. Gluteal muscles

Answers:

1. C
2. B
3. B
4. D
5. D
6. B
7. D
8. C
9. C
10. B
11. C

CROSSWORD PUZZLE:

Across

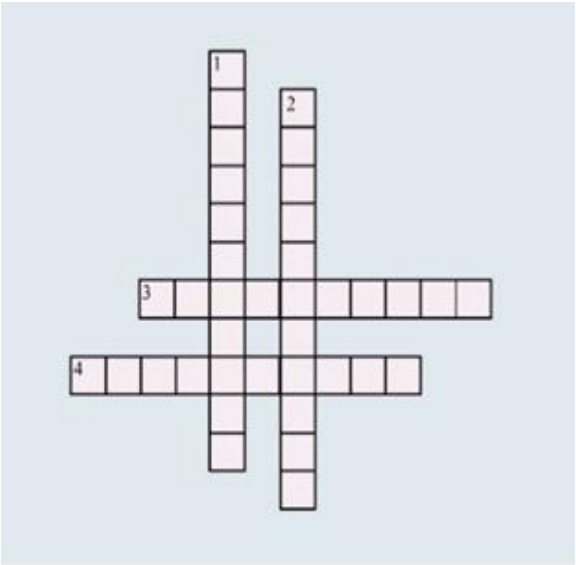
3. Initially studied for *Shigella* and *Salmonella*.

4. All cellular adaptations are reversible.

Down

1. When the size of cells is increasing but the number remains the same.

2. Number of cells increases, size remains the same.



Crossword: Cellular ageing and free radical injury:

Across

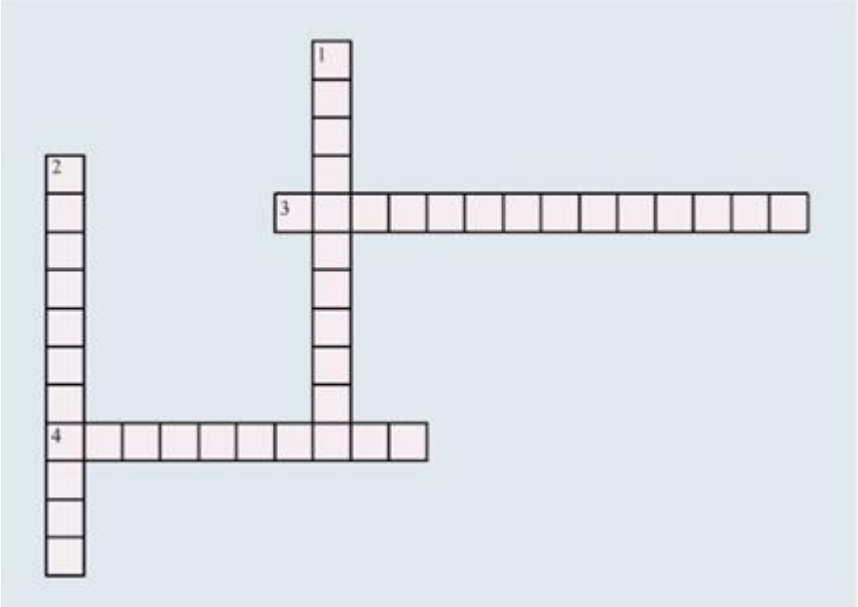
3. Adult progeria syndrome under premature aging:

4. reactivate telomerase:

Down

1. Werner syndrome is a defect in:

2. Drops down immediately:



Acute inflammation: crossword:

Across

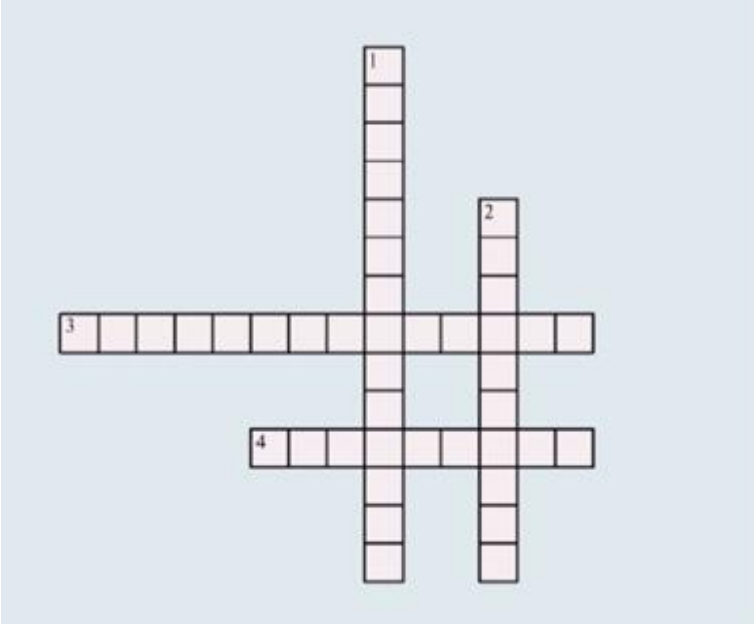
3. He is said to be the father of modern Pathology. His contributions are as follows:

4. This is caused by integrins in Leukocytes. Integrins

Down

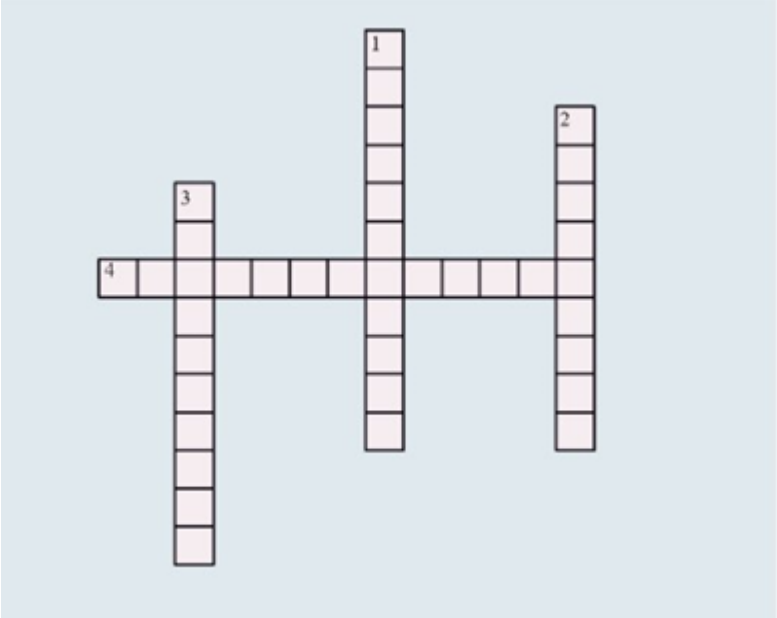
1. Vasoconstriction (First event, Transient event lasting for few seconds, Reflex)

2. Leukocytes Mediated Injury: It is done by WBCs, and Leukocytes by releasing Enzymes.



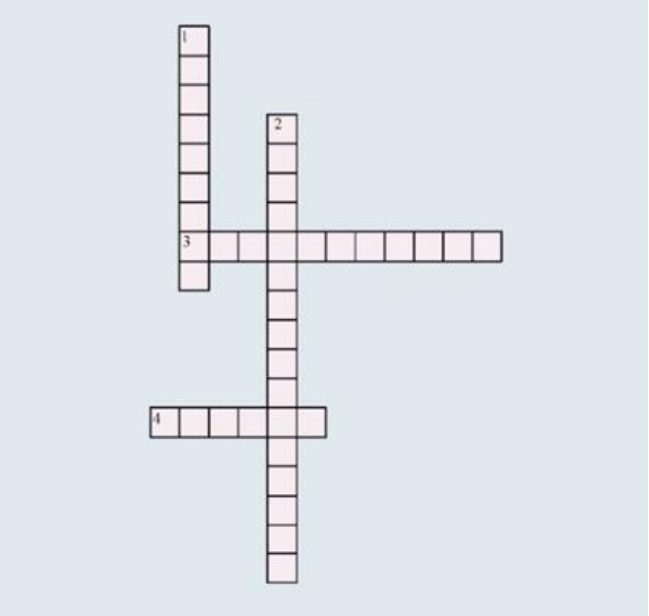
Crossword:
Inflammation mediators:

Across
4. To break Phospholipids, you need Phospholipase A2 and C.
Down
1. L-Arginine is metabolized by nitric oxide synthases (NOS) to nitric oxide and L-citrulline.
2. These enzymes come from granules in neutrophils.
3. They have pathways Classical, MBL (Mannose Binding Lectin) & Alternate pathway.



Chronic inflammation and scar formation:

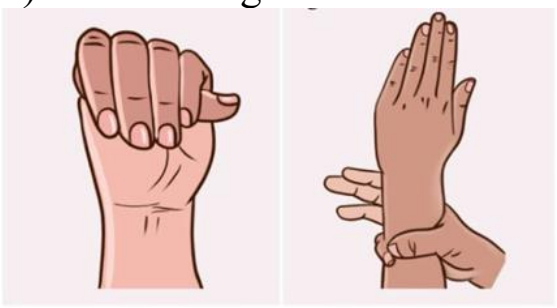
1)Crossword:
Across
3. Activation occurs by Interferon-gamma (IFN-γ)
4. Formed due to trauma
Down
1. It is a category of chronic inflammation
2. Formed due to trauma



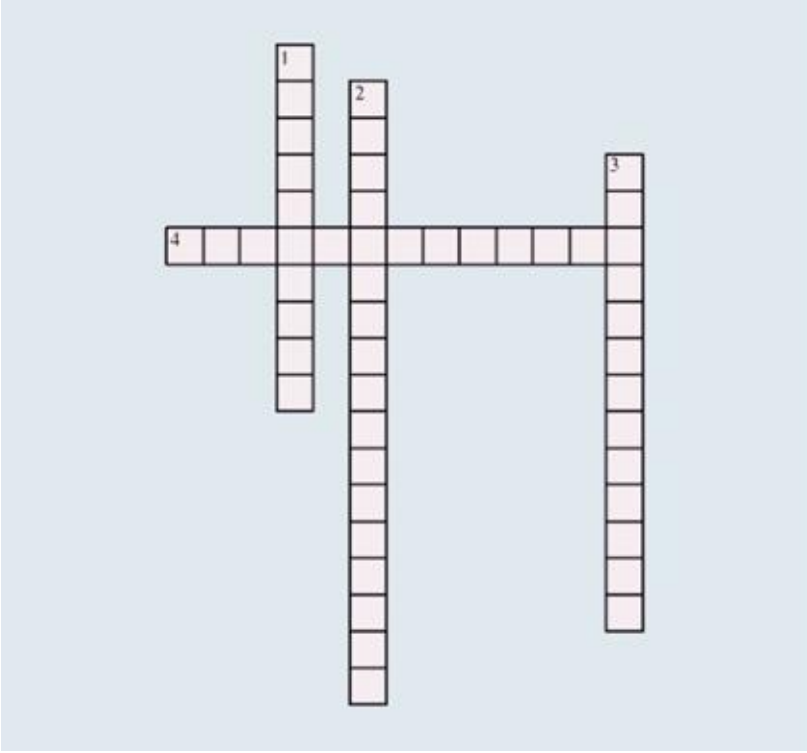
2)
What is keloid? choose the correct picture.
What is Hypertrophic scar? choose the correct picture.

Genetics:
Mendelian Disorders:

1)Name the signs. What is the name of this syndrome?



Crossword:
Across
4. Maltese Cross Appearance because lipids coming out into the urine
Down
1. The test is used for the evaluation of patients with Marfan Syndrome.
2. It is the most common mode of inheritance
3. This test is used for the clinical evaluation of Marfan Patients.



Non mendelian and Chromosomal disorders:

1)What is the name of this syndrome? Write down all clinical features of this syndrome

Multiple Choice Questions (MCQs):

1. Which of the following is an example of non-Mendelian inheritance?
A. Autosomal dominant inheritance
B. Autosomal recessive inheritance
C. X-linked recessive inheritance
D. Mitochondrial inheritance

2. Genomic imprinting refers to:
A. Mutation in mitochondrial DNA
B. Expression of genes from both parental alleles
C. Parent-of-origin–specific gene expression
D. Loss of a chromosome during cell division

3. Which disorder is caused by maternal imprinting defects?
A. Angelman syndrome
B. Turner syndrome
C. Down syndrome
D. Klinefelter syndrome

4. Which condition is associated with uniparental disomy?
A. Cri-du-chat syndrome
B. Prader–Willi syndrome
C. Edwards syndrome
D. Patau syndrome

5. Which type of chromosomal abnormality results from nondisjunction?
A. Translocation
B. Deletion
C. Inversion
D. Aneuploidy

6. Down syndrome is most commonly caused by:
A. Robertsonian translocation
B. Mosaicism
C. Trisomy 21 due to meiotic nondisjunction
D. Deletion of chromosome 21

7. Turner syndrome has which chromosomal pattern?
A. 46,XX
B. 47,XXX
C. 47,XXY
D. 45,X

8. Which chromosomal disorder is characterized by a cat-like cry in infancy?
A. Down syndrome
B. Edwards syndrome
C. Cri-du-chat syndrome
D. Patau syndrome

9. Which disorder is an example of mosaicism?
A. All cells have identical chromosomal makeup
B. Presence of two or more genetically different cell lines
C. Loss of imprinting
D. Single-gene mutation

10. Which mechanism best explains mitochondrial inheritance?
A. Inheritance from both parents
B. Transmission through the Y chromosome
C. Inheritance only from the mother
D. Autosomal dominant transmission

1. D
2. C
3. A
4. B
5. D
6. C
7. D
8. C
9. B
10. C

Neoplasia:

Across

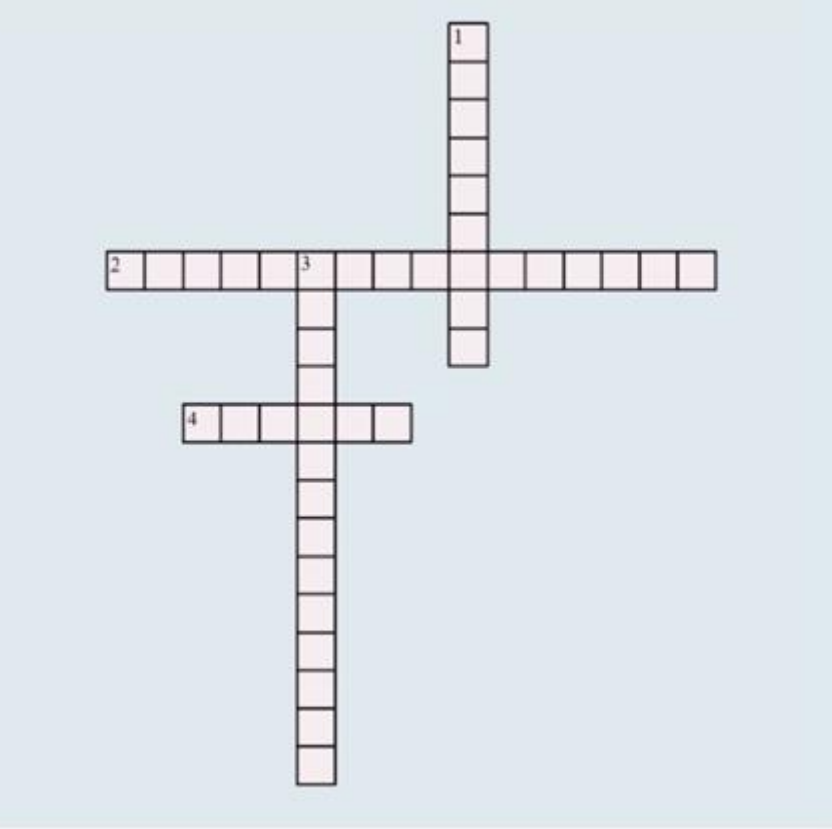
2. Immunity acquired after exposure to particular bacteria, virus or any infection

4. The outermost area of the Lymph Node is called

Down

1. These are also present on membranes of organelles

3. God gifted immunity



Neoplasia:

Mcqs:

1) malignant neoplasms

a. are independent of hormonal influence
b. are always composed of homogenous cell lines
c. arise from differentiated cells by a process of anaplasia
d. display abnormal nuclei with pale nucleoli
e. typically are more rapidly growing than benign neoplasms

2) Regarding metastasis

a. All carcinomas have the ability to metastasise
b. Highly invasive carcinomas rarely metastasise
c. Carcinomas typically spread via lymphatics compared with haematogenous spread
d. Tumour cells develop increased cohesiveness of their cell surface in the formation of cancer cell emboli

3) False about proto oncogenes

a) Important for normal Cell growth
b) May get converted into oncogenes
c) C-myc over-expression causes lymphoma
d)Their mutation causes retinoblastoma

4) In the MAPK pathway, the activation of RAS is counteracted by

a) Protein kinase C
b) GTPase activating protein
c) Phosphatidylinositol
d) Inositol triphosphate

5. Which of the following is a benign tumor

A) Mesothelioma
B) Seminoma
C) Papilloma
D) Melanoma
E) Lymphoma

6. Which of the following statements about adenomas is correct?

A) A benign tumor arising from glandular epithelium
B) A malignant tumor arising from glandular epithelium C) A benign tumor arising from stratified squamous epithelium
D) A malignant tumor arising from mesoderm
E) A benign tumor arising from connective tissue

7. Which of the following is false?

A) Tumors with dense fibrous stroma are called scirrhous tumors.
B) Sarcoma is a malignant tumor of mesenchymal origin.
C) Blastomas are tumors originating from embryonic cells.
D) Hamartomas contain tissues from three germ layers.
E) Epithelial malignant neoplasms are called carcinomas.

8. What is the term for the presence of tissue or an organ in an abnormal location?

A) Differentiation
B) Heterotopia
C) Acanthosis
D) Hypertrophy
E) Hyperplasia

9. What is it called when pancreatic tissue is found in the stomach wall?

A) Hamartoma
B) Choristoma
C) Metaplasia
D) Chloroma
E) Adenoma

10. What is the name for tumors that contain elements from three germ layers?

A) Hamartoma
B) Choristoma
C) Teratoma
D) Carcinoma
E) Sarcoma

11. Which tumor contains multiple neoplastic cell types originating from more than one germ layer?

A) fibroadenoma
B) Lipoma
C) Immature teratoma
D) Adenoma
E) Papilloma

12. What is the term for the loss of cellular uniformity and architectural organization?

A) Apoptosis
B) Necrosis
C) Hyperplasia
D) Metaplasia
E) Dysplasia

13. What is the term for the variability in cell shape, size, and staining characteristics within a tumor?

A) Atypia
B) Pleomorphism
Anaplasia
D) Dysplasia
E) Undifferentiation

14. Which of the following can stimulate angiogenesis?

A) Thrombospondin-1
B) Angiostatin
VC Endostatin
D) Vascularostatin

E) VEGF

15. Which of the following refers to the morphological resemblance of tumor cells to the cell of origin?

A) Dysplasia
B) Differentiation
C) Metaplasia
D) Atypia
E) Anaplasia

1. E
2. C
3. D
4. B
5. C
6. A
7. D
8. B
9. B
10. C
11. C
12. E
13. B
14. E
15. B

Types of hypersensitivity:

Across

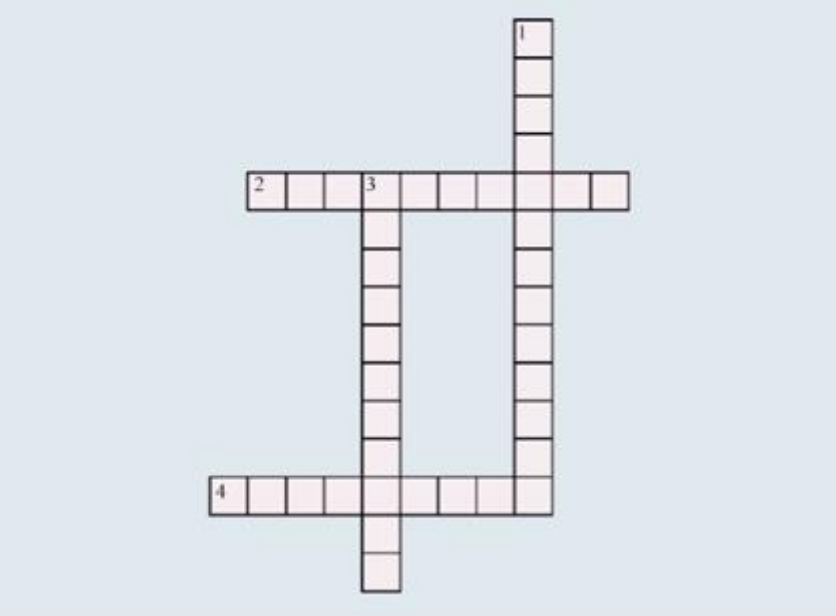
2. The test is done for Echinococcus Granulosus

4. The special stain you have for mast cells and basophils

Down

1. This is a classical hyperthyroidism

3. Drug of choice for VKC



Autoimmune disorders:

Crossword:

Across

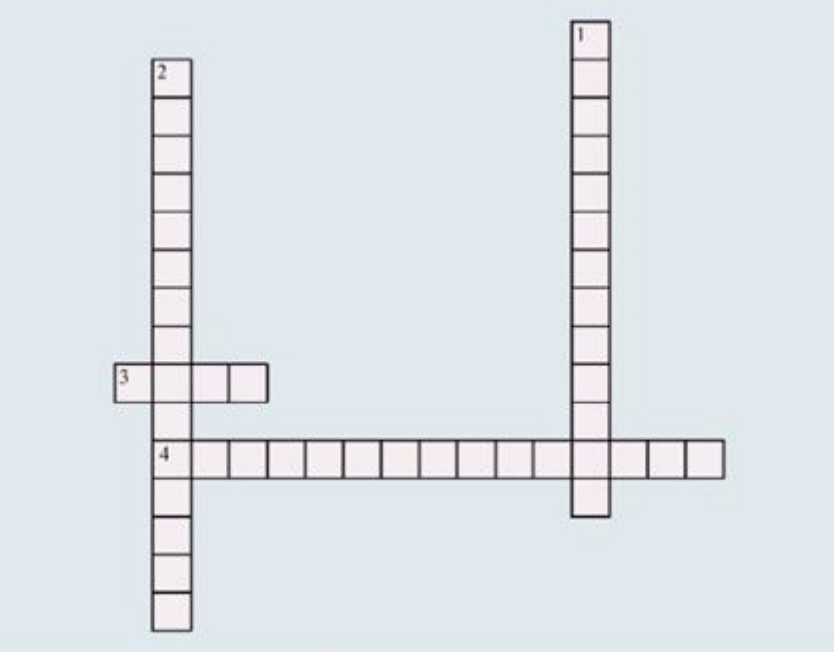
3. (CD25+)-(FOXP3+)

4. Known as dry eyes and dry mouth

Down

1. Dot dot appearance inside the nucleus

2. There is a Type of T cell that decreases immunity



Immunodeficiency disorders:

Crossword:

Across

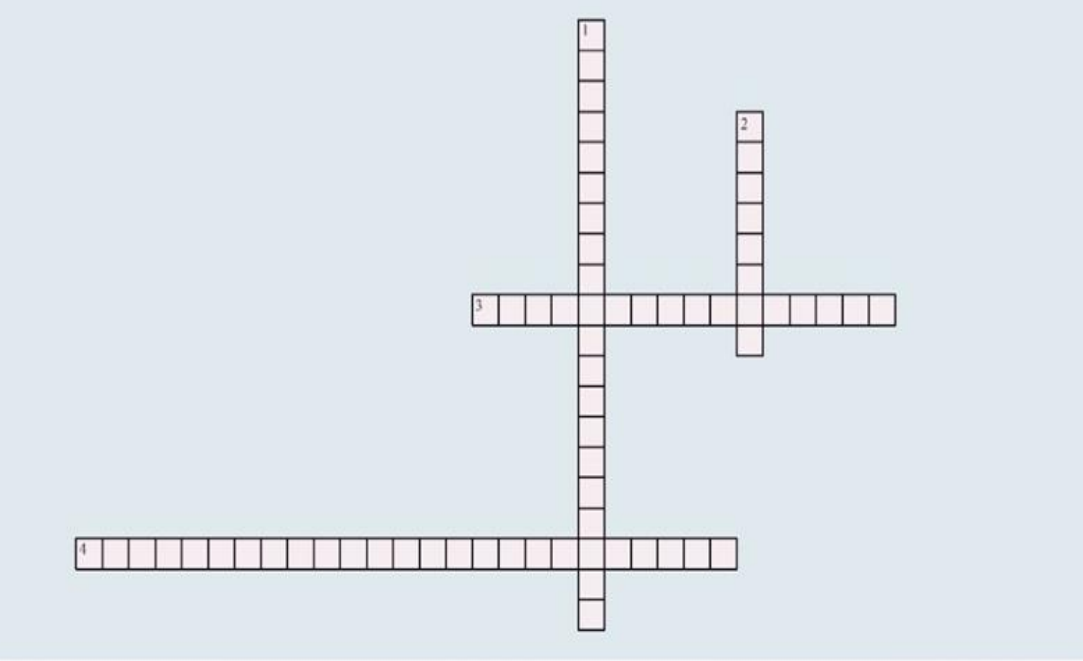
3. It is also known as velo cardio facial syndrome

4. Full form of AR

Down

1. This converts immature B cells into mature B cells

2. It makes plasma cells and antibodies from mature b cells



Amiloidosis:

Crossword:

Across

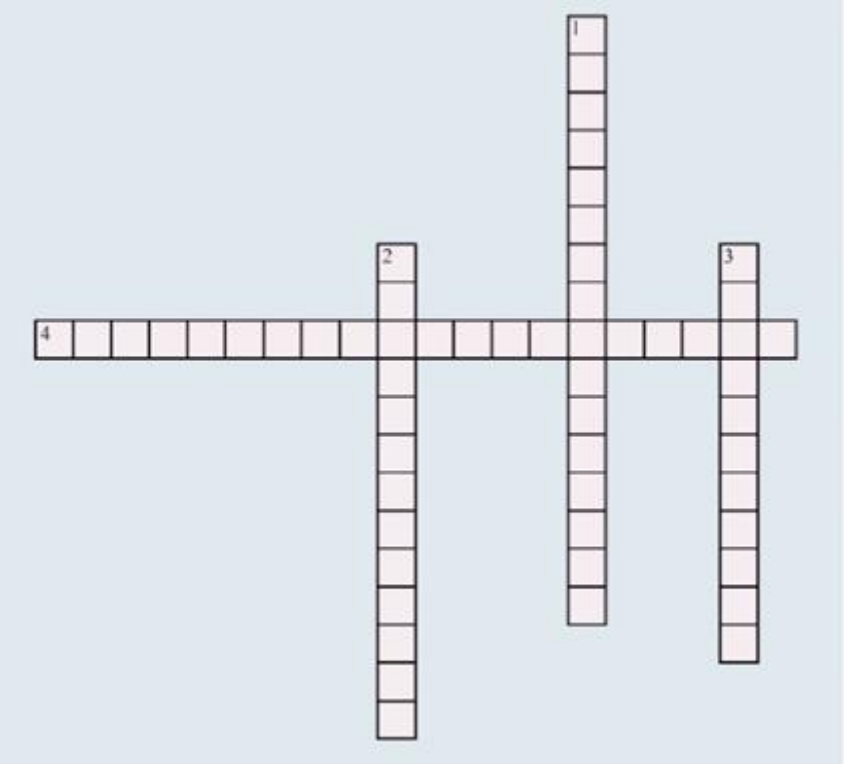
4. It is also known as reactive amyloidosis

Down

1. It is referred to as a fractured cast because it will not be completely pink and it will have little cracks in between

2. TTR is a protein and stands for?

3. This stain uses UV light for examination



Module 1
Control questions:

1. Introduction to Pathology. The Subject of Pathology

1. What is pathology and what are its main objectives?
2. What is the difference between general pathology and systemic pathology?
3. How is pathology related to clinical medicine?
4. What are the main methods used in pathology?
5. Define etiology and pathogenesis.
6. What is the difference between morphological and functional changes?
7. What are the main causes of disease according to pathology?

2. Cellular Adaptations to Stress: Hypertrophy, Hyperplasia, Atrophy, Metaplasia

1. What is cellular adaptation?
2. Define hypertrophy and give one example.
3. Define hyperplasia and list its main types.
4. What is the difference between hypertrophy and hyperplasia?
5. Define atrophy and mention its causes.
6. What is metaplasia and why does it occur?
7. Is metaplasia a reversible process? Explain.
8. Give an example of pathological metaplasia.

3. Cell Pathology: Cellular Injury and Necrosis

1. What is cellular injury?
2. What are the main causes of cellular injury?
3. Distinguish between reversible and irreversible cell injury.
4. What are the main morphological features of necrosis?
5. List the main types of necrosis.
6. What is coagulative necrosis and where is it commonly seen?
7. What is liquefactive necrosis?
8. How does necrosis differ from apoptosis?

4. Cell Pathology: Apoptosis and Its Role in Diseases

1. Define apoptosis.
2. What are the main physiological roles of apoptosis?
3. What are the key morphological features of apoptosis?
4. Name the main pathways of apoptosis.
5. What is the role of caspases in apoptosis?
6. How does apoptosis differ from necrosis?
7. Give examples of diseases associated with increased apoptosis.

8. Give examples of diseases associated with decreased apoptosis.

5. Inflammation I: Alteration, Mediators, Acute Inflammation

1. Define inflammation.
2. What are the main causes of acute inflammation?
3. What is alteration in inflammation?
4. Name the main chemical mediators of inflammation.
5. What are the vascular changes in acute inflammation?
6. Which cells are mainly involved in acute inflammation?
7. What are the main morphological signs of acute inflammation?
8. What is the biological significance of inflammation?

6. Inflammation II: Exudation, Proliferation, Chronic Inflammation, Granulomas

1. What is exudation?
2. What is the difference between exudate and transudate?
3. Define chronic inflammation.
4. Which cells predominate in chronic inflammation?
5. What is a granuloma?
6. Name the main types of granulomas.
7. What is fibrosis and how does it develop?
8. What are the possible outcomes of chronic inflammation?

7. Repair and Regeneration. Wound Healing, Fibrosis

1. What is regeneration?
2. What factors influence tissue regeneration?
3. Define wound healing.
4. What are the main phases of wound healing?
5. What is healing by primary intention?
6. What is healing by secondary intention?
7. What is fibrosis?
8. Name factors that impair wound healing.

8. Microcirculatory Disorders I: Hyperemia, Edema, Congestion, Ischemia

1. Define arterial hyperemia.
2. Define venous congestion.
3. What is edema?
4. List the main mechanisms of edema formation.
5. What is ischemia?
6. What are the causes of ischemia?
7. What are the consequences of prolonged ischemia?
8. Differentiate hyperemia from congestion.

9. Microcirculatory Disorders II: Embolism, Infarction, Shock, Thrombosis

1. Define thrombosis.
2. What are the components of Virchow's triad?
3. What is an embolism?
4. Name the main types of emboli.
5. Define infarction.
6. What factors influence the development of an infarct?
7. What is shock?
8. Name the main types of shock.

10. Diseases of the Immune System I: Normal Immune Response

1. What are the main components of the immune system?
2. What is the difference between innate and adaptive immunity?
3. Name the main cells of the immune system.
4. What is antigen presentation?
5. What are T lymphocytes and B lymphocytes?
6. What is clonal selection?
7. What is the role of cytokines in immune responses?

11. Diseases of the Immune System II: Hypersensitivity, Autoimmunity, Transplant Rejection

1. Define hypersensitivity.
2. Name the four types of hypersensitivity reactions.
3. What is type I hypersensitivity?
4. What is autoimmune disease?
5. What factors contribute to autoimmunity?
6. What is transplant rejection?
7. Name the main types of transplant rejection.
8. What is the role of the immune system in graft rejection?

12. Diseases of the Immune System III: Immunodeficiency, AIDS, Amyloidosis

1. What is immunodeficiency?
2. Distinguish between primary and secondary immunodeficiency.
3. What is AIDS?
4. What virus causes AIDS?
5. What cells are primarily affected in AIDS?
6. Define amyloidosis.
7. What is amyloid?
8. Name organs commonly affected by amyloidosis.

13. Neoplasia I: Nomenclature, Benign and Malignant Tumors, Cancer Genes

1. Define neoplasia.

2. What is the difference between benign and malignant tumors?
3. What is differentiation in tumors?
4. What is anaplasia?
5. Define oncogenes.
6. What are tumor suppressor genes?
7. What are the hallmarks of cancer?
8. What is multistep carcinogenesis?

14. Neoplasia II: Etiology and Clinical Aspects of Cancer

1. What are carcinogens?
2. Name the main types of carcinogenic agents.
3. What is chemical carcinogenesis?
4. What is viral oncogenesis?
5. What is tumor grading?
6. What is tumor staging?
7. What is metastasis?
8. What are paraneoplastic syndromes?

15. Genetic Diseases I: Mendelian and Complex Disorders

1. What are genetic diseases?
2. What is a Mendelian disorder?
3. Name the main patterns of Mendelian inheritance.
4. What is autosomal dominant inheritance?
5. What is autosomal recessive inheritance?
6. What are multifactorial diseases?
7. What are cytogenetic disorders?

16. Pediatric Diseases

1. What are congenital diseases?
2. What are the main causes of pediatric diseases?
3. What is intrauterine growth retardation?
4. What are chromosomal abnormalities?
5. What are metabolic diseases in children?
6. Why are children more vulnerable to infections?
7. What is sudden infant death syndrome (SIDS)?

17. General Pathology of Infectious Diseases

1. What is an infectious disease?
2. What are the main types of infectious agents?
3. How do pathogens cause tissue injury?
4. What is the host immune response to infection?
5. What is sepsis?
6. What is bacteremia?
7. What are granulomatous infections?

18. Nutritional Diseases. Injury by Physical Agents

1. What are nutritional diseases?
2. What is protein-energy malnutrition?
3. What is vitamin deficiency?
4. Give examples of diseases caused by vitamin deficiency.
5. What are physical agents causing injury?
6. How does radiation cause tissue damage?
7. What is thermal injury?
8. What are the pathological effects of trauma?

Module 2

Control questions:

10. Diseases of the Immune System I

The Normal Immune Response. Cells and Tissues of the Immune System. Lymphocyte Activation and Adaptive Immune Responses

1. What are the main functions of the immune system?
2. Differentiate between **innate** and **adaptive immunity**.
3. What cells are involved in innate immunity?
4. Describe the structure and function of **primary lymphoid organs**.
5. Describe the structure and function of **secondary lymphoid organs**.
6. What are **antigen-presenting cells (APCs)**?
7. Explain the role of **dendritic cells** in immune responses.
8. Compare **T lymphocytes** and **B lymphocytes**.
9. Describe the process of **lymphocyte activation**.
10. What is the role of **MHC class I and MHC class II molecules**?
11. Explain **clonal selection** and **clonal expansion**.
12. What is the difference between **humoral** and **cell-mediated immunity**?
13. Describe the phases of the adaptive immune response.

11. Diseases of the Immune System II

Hypersensitivity. Autoimmune Diseases. Transplant Rejection

Hypersensitivity

14. What is **hypersensitivity**?
15. Classify hypersensitivity reactions (Types I–IV).
16. Describe the mechanism of **Type I hypersensitivity**.
17. Give examples of **Type I hypersensitivity diseases**.
18. Explain the pathogenesis of **Type II hypersensitivity**.
19. What is **immune complex–mediated (Type III) hypersensitivity**?
20. Describe **Type IV (delayed-type) hypersensitivity**.

Autoimmune Diseases

21. Define **autoimmunity**.
22. What mechanisms maintain **self-tolerance**?
23. What factors contribute to the development of autoimmune diseases?

24. Differentiate between **organ-specific** and **systemic autoimmune diseases**.
25. Give examples of autoimmune diseases.

Transplant Rejection

26. What is **graft rejection**?
27. Define **hyperacute**, **acute**, and **chronic rejection**.
28. What role does **HLA matching** play in transplantation?
29. What is **graft-versus-host disease (GVHD)**?

12. Diseases of the Immune System III
Immunodeficiency Syndromes. AIDS. Amyloidosis
Immunodeficiency

30. What is **immunodeficiency**?
31. Differentiate between **primary** and **secondary immunodeficiency**.
32. Give examples of primary immunodeficiency diseases.
33. Describe the clinical features of immunodeficiency disorders.

AIDS

34. What is **Acquired Immunodeficiency Syndrome (AIDS)**?
35. Which cells are targeted by **HIV**?
36. Describe the stages of HIV infection.
37. What opportunistic infections are associated with AIDS?

Amyloidosis

38. What is **amyloidosis**?
39. Describe the structure and composition of amyloid.
40. Classify amyloidosis.
41. How does amyloid deposition cause organ dysfunction?

13. Neoplasia I
Nomenclature. Benign vs Malignant Tumors. Epidemiology. Cancer Genes. Hallmarks of Cancer

42. Define **neoplasia**.
43. What is the difference between **benign** and **malignant** tumors?
44. Explain the terms **differentiation** and **anaplasia**.
45. What is **carcinoma** and what is **sarcoma**?
46. Define **metastasis** and describe its pathways.
47. What factors influence cancer epidemiology?

Cancer Genetics

48. What are **oncogenes**?
49. What are **tumor suppressor genes**?
50. What is the role of **p53** in cancer?
51. Define **multistep carcinogenesis**.
52. List and explain the **hallmarks of cancer**.

14. Neoplasia II & Genetic Diseases I
Etiology and Clinical Aspects of Cancer

53. What are **carcinogenic agents**?

54. Classify chemical carcinogens.
55. Describe the role of **viruses** in carcinogenesis.
56. What are the clinical effects of malignant tumors?
57. Explain **paraneoplastic syndromes**.

Genetic Diseases I

58. What is a **genetic disease**?
59. Classify genetic abnormalities causing human disease.
60. What is a **mutation**?
61. Define **Mendelian disorders**.
62. Describe **autosomal dominant inheritance**.
63. Describe **autosomal recessive inheritance**.
64. Describe **X-linked inheritance**.

15. Complex Disorders, Cytogenetics & Pediatric Diseases

65. What are **complex multigenic disorders**?
66. Give examples of multifactorial diseases.
67. What is a **cytogenetic disorder**?
68. Define **aneuploidy**.
69. Describe **Down syndrome** and its genetic basis.
70. What are **non-Mendelian patterns of inheritance**?
71. Explain **mitochondrial inheritance**.
72. What are common pediatric genetic diseases?

16. General Pathology of Infectious & Nutritional Diseases

Infectious Diseases

73. What is an **infectious disease**?
74. Classify infectious agents.
75. Describe the stages of infectious disease development.
76. What are the mechanisms of tissue injury in infections?
77. Define **sepsis** and **septic shock**.

Nutritional Diseases

78. What are **nutritional diseases**?
79. Describe the effects of **protein-energy malnutrition**.
80. What diseases are caused by vitamin deficiencies?
81. What are the consequences of obesity?

General Pathological Anatomy 3rd semester.
Module1
Variant 1

1. Which of the following is an early event directly associated with ATP depletion in hypoxic cell injury?
A) Cellular swelling
B) Nuclear pyknosis
C) Lipid peroxidation
D) Free radical formation
E) Membrane damage

2. The mechanism of cellular swelling in tissue hypoxia is most closely related to which of the following?

A) Free radical toxicity

B) Decreased apolipoprotein synthesis

C) Calcium influx into mitochondria

D) Irreversible cell membrane damage

E) Decreased ATP concentration

3.Which of the following is the most common type of necrosis?
A) Liquefactive necrosis
B) Caseous necrosis
C) Coagulative necrosis
D) Enzymatic fat necrosis
E) Fibrinoid necrosis

4.Which type of necrosis is observed in acute myocardial infarction?
A) Coagulative necrosis

B) Caseous necrosis
C) Fibrinoid necrosis
D) Liquefactive necrosis
E) Fat necrosis

5. Which of the following organ-necrosis type pairings is incorrect?
A) Pancreas - Enzymatic fat necrosis
B) Heart - Coagulative necrosis
C) Spleen - Liquefactive necrosis
D) Brain - Liquefactive necrosis
E) Tuberculosis - Caseous necrosis

6.Which of the following is not an adaptation mechanism?
A) Atrophy
B) Hypertrophy
C) Metaplasia
D) Hypoplasia
E) Hyperplasia

7. Which of the following is irreversible?
A) Atrophy
B) Metaplasia
C) Mild dysplasia
D) Necrosis
E) Hypertrophy

8.Which cell responds earliest to chemotactic agents in an inflammatory response?
A) T lymphocyte
B) B lymphocyte
C) Histiocyte
D) Neutrophil
E) Plasma cell

9. Which of the following is not a feature of chronic inflammation?
A) Increased vascularization
B) Lymphocytes
C) Polymorphonuclear leukocytes
D) Histiocytes
E) Tissue destruction

10. Which of the following best defines the process by which polymorphonuclear neutrophils are directed to the site of injury during acute inflammation?
A) Active hyperemia
B) Karyorrhexis
C) Passive hyperemia

D) Chemotaxis
E) Karyolysis

11. Which complement component is involved in the initiation of the alternative pathway?
A) C1
B) C2
C) C3b
D) C4
E) C5a

12. A 7-year-old boy has recurrent Staphylococcus aureus infections. Peripheral blood leukocytes appear normal, but the Nitroblue Tetrazolium (NBT) dye test is abnormal. Which of the following best explains the pathogenesis of his disease?
A) NADPH oxidase deficiency
B) Defective fusion of phagosomes and lysosomes
C) C1-INH deficiency
D) Myeloperoxidase deficiency
E) Immunoglobulin deficiency

13. Which of the following organs has a higher rate of scar tissue formation in response to inflammation?
A) Spleen
B) Skeletal muscle
C) Uterus
D) Liver
E) Lung

14. Which of the following cells is <u>not</u> a labile cell?
A) Kidney
B) Erythrocyte
C) Salivary gland duct epithelium
D) Skin
E) Pancreatic duct epithelium

15. After platelets adhere to subendothelial collagen, which of the following is critical for platelet aggregation?
A) ADP
B) ATP
C) Histamine
D) PG12
E) P-selectin

16. A construction worker suffers multiple fractures of the pelvis and femur after a fall. On the second day in the hospital, he develops confusion, petechial rash, severe dyspnea, and hypoxemia. What is the most likely diagnosis?
A) Disseminated intravascular coagulation
B) Fat embolism
C) Endotoxic shock
D) Thrombotic thrombocytopenic purpura
E) Amniotic fluid embolism

17. Which of the following can stimulate angiogenesis?
A) Thrombospondin-1
B) Angiostatin
C) Endostatin
D) Vasculаrostatin
E) VEGF

18. Which of the following is known as the "death receptor"?
A) CD95
B) P53
C) BCL2
D) BAX
E) BID

19. Touton giant cells typically contain:
a) Nuclei arranged in the periphery
b) A central ring of nuclei with foamy cytoplasm
c) Numerous small nuclei at the edges
d) A single large nucleus

20. Which of the following is a consequence of arterial thrombosis?
a) Infarction
b) Edema
c) Varicose veins
d) Cyanosis only

General Pathological Anatomy 3rd semester.
Module1
1 variant
1-A; 2-E; 3- C; 4-A; 5-C; 6-D; 7-D; 8-D; 9-C; 10-D; 11-C; 12-A; 13-B; 14-A; 15-A; 16-B; 17-E; 18-A; 19-B; 20-A

2 variant

1. Which of the following best defines hyperplasia?
   a) Increase in cell size
   b) Increase in cell number
   c) Decrease in cell size
   d) Replacement of one cell type by another
2. A 60-year-old man with chronic smoking develops a change in the bronchial epithelium from columnar to squamous type. This is an example of:
   a) Dysplasia
   b) Metaplasia
   c) Hyperplasia
   d) Atrophy
3. A patient with acute myocardial infarction shows dead cardiac fibers with preserved architecture. What type of necrosis is present?
   a) Liquefactive
   b) Coagulative
   c) Caseous
   d) Fat
4. Apoptosis is best defined as:
   a) Uncontrolled cell death with inflammation
   b) Programmed cell death without inflammation
   c) Cell division without control
   d) Necrosis caused by hypoxia
5. Which enzyme family plays a central role in apoptosis?
   a) Kinases
   b) Caspases
   c) Cyclins
   d) Proteases
6. A cancer cell treated with chemotherapy shows nuclear fragmentation without inflammation. This process is:
   a) Necrosis
   b) Autophagy
   c) Apoptosis
   d) Degeneration
7. The main vascular change in acute inflammation is:
   a) Vasoconstriction
   b) Vasodilation
   c) Thrombosis
   d) Ischemia
8. The predominant cell in acute inflammation is:
   a) Lymphocyte
   b) Macrophage
   c) Neutrophil
   d) Plasma cell

9. A patient develops redness, swelling, and heat around a wound within hours. The main cause of these changes is:
   a) Lymphatic obstruction
   b) Vasodilation and increased permeability
   c) Chronic fibrosis
   d) Granuloma formation
10. Chronic inflammation is characterized by:
   a) Predominance of neutrophils
   b) Lymphocytes and macrophages
   c) Absence of fibrosis
   d) Short duration
11. A granuloma is formed mainly by:
   a) Eosinophils
   b) Epithelioid macrophages
   c) Mast cells
   d) Neutrophils
12. A patient with tuberculosis develops a lesion containing epithelioid cells and giant cells surrounded by lymphocytes. This is an example of:
   a) Abscess
   b) Granuloma
   c) Fibroma
   d) Edema
13. Regeneration occurs in tissues with:
   a) Permanent cells
   b) Stable or labile cells
   c) Fibrotic tissue
   d) Necrotic tissue
14. Excessive collagen deposition in wound healing is called:
   a) Keloid
   b) Granuloma
   c) Atrophy
   d) Hypertrophy
15. A surgical incision heals without infection and minimal scar formation. This process is called:
   a) Secondary intention
   b) Primary intention
   c) Chronic inflammation
   d) Fibrosis
16. Arterial hyperemia is due to:
   a) Increased arterial inflow
   b) Decreased venous outflow
   c) Lymphatic obstruction
   d) Dehydration
17. The main cause of edema is:
   a) Increased hydrostatic pressure

b) Increased plasma proteins
c) Vasoconstriction
d) Increased osmotic pressure

18. A patient with right-sided heart failure develops leg swelling. The mechanism is:
a) Decreased venous return
b) Increased hydrostatic pressure in veins
c) Increased capillary permeability
d) Sodium loss

19. An embolus is best defined as:
a) Detached intravascular mass carried by blood
b) Blood clot forming in situ
c) Local vessel dilation
d) Fibrin deposition in tissue

20. Infarction refers to:
a) Death of tissue due to lack of blood supply
b) Inflammation of vessels
c) Edema of organs
d) Bleeding into tissue

Module1 2 variant

1. b
2. b
3. b
4. b
5. b
6. c
7. b
8. c
9. b
10. b
11. b
12. b
13. b
14. a
15. b
16. a
17. a
18. b
19. a
20. a

Module1 variant 3

1. Earliest feature of reversible cell injury is:
   a. Amorphous densities
   b. Ribosomal detachment
   c. Hydropic swelling
   d. Bleb formation
2. All of the following statements are true regarding reversible cell injury; EXCEPT:
   a. Diminished generation of ATP
   b. Formation of blebs in the plasma membrane
   c. Condensation of nuclear chromatin
   d. Detachment of ribosomes from the granular endoplasmic reticulum
3. Which of the following type of necrosis is most commonly associated with ischemic injury:
   a. Coagulative necrosis
   b. Caseous necrosis
   c. Liquefactive necrosis
   d. Fat necrosis
4. Internucleosomal cleavage of DNA is characteristic of:
   a. Reversible cell injury
   b. Irreversible cell injury
   c. Necrosis
   d. Apoptosis
5. Integrins include receptor; EXCEPT:
   a. Fibronectin
   b. Glycoprotein on platelet surface
   c. Leukocyte adhesion molecule
   d. Platelet derived growth factor
6. Exudation of plasma and leucocytes in inflammation is from:
   a. Venules
   b. Capillaries
   c. Arterioles
   d. Arterioles and capillaries
7. Digestion of foreign material by a neutrophil or macrophage during phagocytosis is mainly due to:
   a. Complement
   b. Hydrogen peroxide
   c. Kinins
   d. Lysosomal enzymes
8. Which among the following is the hallmark of acute inflammation?
   a. Vasoconstriction
   b. Stasis
   c. Vasodilation and increase in permeability
   d. Leukocyte margination
9. Which of the following is not an inflammatory mediator?
   a. Tumor necrosis factor

b. Myeloperoxidase
c. Interferons
d. Interleukin

10. Cell swelling is seen in all; EXCEPT:
    a. Infection
    b. Calcification
    c. Malignancy
    d. Hypoxia
11. Fat necrosis occurs at all sites; EXCEPT:
    a. Pancreas
    b. Breast
    c. Liver
    d. Peritoneum
12. Morphological changes seen in chronic non-specific inflammation include an increase in:
    a. Neutrophils, lymphocytes and liquefactive necrosis
    b. Neutrophils, macrophages and fibrosis
    c. Lymphocytes, plasma cells and fibrosis
    d. Giant cells, macrophages and coagulative necrosis
13. Focus of granulomatous inflammation show all of the following; EXCEPT:
    a. Eosinophils
    b. Epithelioid cells
    c. Fibrosis
    d. Lymphocytes
14. All are true about white infarcts; EXCEPT:
    a. Edema is present
    b. Occurs in organs with end arterial supply
    c. Well-defined margins
    d. Coagulative necrosis
15. Which is the most abundant plasma protein?
    a. Albumin
    b. Globulin
    c. Fibrinogen
    d. Bence Jones protein
16. Testing for which of the following infection is not done before giving blood transfusion?
    a. HIV 1,2
    b. Hepatitis B
    c. Hepatitis C
    d. Hepatitis A
17. All are true about arterial thrombosis; EXCEPT:
    a. Retrograde growth
    b. Stasis in veins
    c. Line of Zahn
    d. Complete lumen obstruction

18. Which is the most common site of arterial embolization?
    a. Brain
    b. Kidney
    c. Mesentery
    d. Lower extremities
19. All of the following are true in respect of angioneurotic edema; EXCEPT:
    a. It is caused by deficiency of complement proteins
    b. It is more common in females
    c. It manifests as pitting edema
    d. It is an autosomal dominant disorder
20. Warthin–Finkeldey giant cells are typically seen in:
    a. Measles (rubeola)
    b. Tuberculosis
    c. Foreign body reaction
    d. Fat necrosis

Answers:

1–c
2–c
3–a
4–d
5–d
6–a
7–d
8–c
9–b
10–b
11–c
12–c
13–a
14–a
15–a
16–d
17–b
18–a
19–c
20–a

Module 2 (2 year 3rd semester):

VARIANT 1

1. **A patient lacks the ability to activate $CD8^+$ T cells in response to viral infection. Which molecular defect is most likely responsible?**
   A. Absence of MHC class II expression
   B. Defect in TAP transporter proteins (↓ MHC class I)
   C. CD40 ligand deficiency
   D. Failure of immunoglobulin class switching
2. **Which cytokine is essential for differentiation of naïve $CD4^+$ T cells into Th1 cells?**
   A. IL-4
   B. IL-5
   C. IL-12
   D. TGF-β
3. **Cross-presentation of antigens is primarily performed by:**
   A. B lymphocytes
   B. Macrophages
   C. Dendritic cells
   D. Plasma cells
4. **A patient develops hemolytic anemia after receiving incompatible blood. Which mechanism is responsible for the tissue injury?**
   A. IgE-mediated mast cell degranulation
   B. Antibody-dependent cellular cytotoxicity
   C. Immune complex deposition
   D. T-cell–mediated cytotoxicity
5. **Which hypersensitivity reaction is most responsible for post-streptococcal glomerulonephritis?**
   A. Type I
   B. Type II
   C. Type III
   D. Type IV
6. **Loss of peripheral tolerance is most closely associated with dysfunction of:**
   A. Central deletion
   B. AIRE gene
   C. Regulatory T cells
   D. B-cell receptor editing

7. **Chronic rejection of a kidney transplant is primarily characterized by:**
   A. Acute neutrophilic infiltration
   B. Immune complex deposition in glomeruli
   C. Progressive intimal fibrosis of vessels
   D. Preformed anti-donor antibodies
8. **A child presents with severe viral, fungal, and protozoal infections. Genetic analysis reveals a mutation in the common γ-chain of cytokine receptors. Which condition is most likely?**
   A. DiGeorge syndrome
   B. SCID
   C. Bruton agammaglobulinemia
   D. Wiskott–Aldrich syndrome
9. **A patient with selective IgA deficiency develops anaphylaxis after plasma transfusion. The reaction is mediated by:**
   A. IgE against donor antigens
   B. Anti-IgA antibodies
   C. Complement activation
   D. Immune complexes
10. **HIV preferentially infects cells using which co-receptors?**
    A. CXCR4 and CCR5
    B. CD28 and CD40
    C. IL-2 receptor
    D. CD8
11. **AA amyloidosis is most commonly associated with:**
    A. Plasma cell dyscrasias
    B. Chronic inflammatory diseases
    C. Alzheimer disease
    D. Long-term dialysis
12. **Which genetic alteration converts a proto-oncogene into an oncogene?**
    A. Loss-of-function mutation
    B. Gene amplification
    C. Promoter methylation
    D. Deletion of tumor suppressor gene
13. **Anaplasia in malignant tumors is best defined as:**
    A. Increased mitotic rate
    B. Loss of differentiation and cellular polarity
    C. Tumor encapsulation
    D. Metastatic potential
14. **The ability of cancer cells to evade apoptosis is most commonly associated with mutation of:**
    A. RAS
    B. MYC
    C. BCL-2
    D. APC
15. **Which carcinogenic agent acts as a complete carcinogen?**
    A complete carcinogen is an agent that can cause both:
    Initiation (direct DNA damage / mutation)
    Promotion (stimulates proliferation of mutated cells)
    A. Asbestos
    B. Aflatoxin B1
    C. UV radiation
    D. Alcohol

16. **Paraneoplastic syndromes are best explained by:**
    A. Tumor invasion
    B. Metastatic spread
    C. Hormone or cytokine production by tumors
    D. Immune complex deposition
17. **Which inheritance pattern is most consistent with variable expressivity and incomplete penetrance?**
    A. Autosomal recessive
    B. X-linked recessive
    C. Autosomal dominant
    D. Mitochondrial
18. **Septic shock is primarily caused by:**
    A. Direct bacterial invasion
    B. Endotoxin-mediated cytokine storm
    C. Antibody deficiency
    D. Immune complex deposition
19. **Which pathogen causes disease mainly through exotoxin production?**
    A. Mycobacterium tuberculosis
    B. Corynebacterium diphtheriae
    C. Chlamydia trachomatis
    D. Plasmodium falciparum
20. **Marasmus differs from kwashiorkor by:**
    A. Presence of edema
    B. Isolated protein deficiency
    C. Combined calorie and protein deficiency
    D. Fatty liver

Module 2 (2 year 3rd semester):
VARIANT 2

1. **Failure of negative selection in the thymus is most likely due to mutation in:**
    A. RAG genes
    B. AIRE gene
    C. BTK gene
    D. FOXP3
2. **Which immunologic mechanism underlies contact dermatitis?**
    A. IgE-mediated reaction
    B. Immune complex deposition
    C. Cytotoxic T-cell response
    D. Complement-mediated lysis
3. **Which cytokine promotes B-cell class switching to IgE?**
    A. IFN-γ
    B. IL-2
    C. IL-4
    D. IL-12
4. **Anti-dsDNA antibodies are most strongly associated with:**
    A. Rheumatoid arthritis
    B. Scleroderma

C. Systemic lupus erythematosus
D. Sjögren syndrome

5. **Graft-versus-host disease occurs most commonly after:**
   A. Kidney transplantation
   B. Liver transplantation
   C. Bone marrow transplantation
   D. Heart transplantation
6. **Which cell type is primarily responsible for acute cellular rejection?**
   A. B lymphocytes
   B. Plasma cells
   C. $CD8^+$ T cells
   D. Neutrophils
7. **A child with eczema, recurrent infections, and thrombocytopenia most likely has mutation in:**
   A. BTK
   B. WAS gene
   C. ADA
   D. IL-2 receptor
8. **Opportunistic infections in AIDS patients occur primarily due to loss of:**
   A. B-cell function
   B. Neutrophils
   C. $CD4^+$ T cells
   D. Complement
9. **Dialysis-related amyloidosis is caused by deposition of:**
   A. AA protein
   B. AL protein
   C. β2-microglobulin
   D. Transthyretin
10. **Which hallmark of cancer allows cells to replicate unlimited?**
    A. Sustained angiogenesis
    B. Tissue invasion
    C. Evasion of apoptosis
    D. Telomerase activation
11. **Tumor suppressor gene RB regulates the cell cycle at:**
    A. G2–M checkpoint
    B. S phase
    C. G1–S checkpoint
    D. M phase
12. **Which mechanism best explains chromosomal instability in cancer cells?**
    A. Point mutation
    B. Defective DNA repair
    C. Epigenetic silencing
    D. Loss of apoptosis
13. **Anticipation is most commonly associated with:**
    A. Missense mutations
    B. Trinucleotide repeat expansion
    C. Frameshift mutations
    D. Deletions
14. **Turner syndrome karyotype is:**
    A. 47,XXY
    B. 47,XXX

C. 45,X
D. 46,XX

15. **Which pediatric disease results from failure of neural crest cell migration?**
    A. Cystic fibrosis
    B. Hirschsprung disease
    C. Phenylketonuria
    D. Hemophilia A
16. **Granuloma formation is most characteristic of infection with:**
    A. Streptococcus pneumoniae
    B. Staphylococcus aureus
    C. Mycobacterium tuberculosis
    D. Neisseria meningitidis
17. **Which vitamin deficiency causes pellagra?**
    A. Vitamin B1
    B. Vitamin B3
    C. Vitamin B6
    D. Vitamin C
18. **Protein-energy malnutrition causes immunodeficiency mainly by:**
    A. Reduced complement synthesis
    B. Impaired T-cell–mediated immunity
    C. Increased IgE production
    D. Neutrophilia
19. **Which pathogen most commonly causes sepsis in immunocompromised patients?**
    A. Candida species
    B. Influenza virus
    C. Giardia lamblia
    D. Entamoeba histolytica
20. **Which factor increases cancer risk by promoting chronic inflammation?**
    A. Smoking
    B. UV radiation
    C. Helicobacter pylori infection
    D. Ionizing radiation

Module 2 Answers – Variant 1

1. B
2. C
3. C
4. B
5. C
6. C
7. C
8. B
9. B
10. A
11. B
12. B
13. B
14. C
15. B
16. C
17. C
18. B

19. B
20. C

Module 2 Answers – Variant 2

1. B
2. C
3. C
4. C
5. C
6. C
7. B
8. C
9. C
10. D
11. C
12. B
13. B
14. C
15. B
16. C
17. B
18. B
19. A
20. C

pathology_1(exam_with_answers)

1.Tissue thromboplastin activates:

A)Factor IV

B)Factor VI

C)+Factor VII

D)All of the above

2.Invasive carcinoma differs from carcinoma in situ by:

A)Abnormal nuclear morphology

B)Pleomorphism

C)+Basement membrane involvement

D)Mitoses

3.Epithelioid granuloma consists mainly of which type of cells?

A)B cells

B)T cells

C)Monocytes

D)+Macrophages

4.Apoptosis is:

A)Regeneration of cells after injury

B)Reperfusion injury of the cells

C)+Programmed internal cell death

D)Uncontrolled multiplication of cells

5.Red infarct is seen in:

A)Kidney

B)Heart

C)Limbs

D)+Small intestine

6.Edema results when the plasma proteins fall below:

A)0.5%

B)5%

C)15%

D)+50%

7.Gamma-Gandy bodies contain hemosiderin and:

A)Potassium

B)Magnesium

C)+Calcium

D)Sodium

8.Lipofuscin, the golden yellow pigment is seen in heart muscles in:

A)+Atrophy

B)Hypertrophy

C)Infarction

D)Hyperplasia

9.Heart failure cells are:

A)Lipofuscin granules in cardiac cells

B)Pigmented hepatocytes

C)+Pigmented alveolar macrophages

D)Pigmented cells in pancreas

10.Red infarct is seen in:

A)Spleen

B)Kidney

C)Heart

D)+Lung

11.If calcium levels are normal, which type of calcification is seen?

A)Metastatic

B)+Dystrophic

C)Dysplastic

D)Metaplastic

12.Metastatic calcification is seen in:

A)Cysts

B)Atheroma

C)+Normal tissues

D)Infarcts

13.Myositis ossificans is differentiated from other reactive fibroblastic proliferations by the presence of:

A)Dysplastic bone

B)Dystrophic bone

C)+Metaplastic bone

D)Hypertrophic bone

14.Psammoma bodies shows which type of calcification?

A)Secondary

B)+Dystrophic

C)Metastatic

D)All of the above

15.First change seen in acute inflammation is:

A)Increased permeability

B)Vasodilation

C)Neutrophil migration

D)+Vasoconstriction

16.Apoptosis is inhibited by:

A)c-myc

B)ras

C)p53

D)+bcl-2

17.Periodic acid Schiff stain shows black positivity in:

A)Megakaryoblasts

B)Monoblasts

C)+Lymphoblasts

D)Myeloblasts

18.Microalbuminuria is defined as:

A)Protein levels of 10–50 mg/L

B)+Protein levels of 51–300 mg/L

C)Protein levels of 301–600 mg/L

D)Protein levels of 601–900 mg/L

19.Organelle playing an important role in apoptosis:

A)Nucleus

B)+Mitochondria

C)Golgi complex

D)Endoplasmic reticulum

20.The process of programmed gene directed cell death characterized by cell shrinkage, nuclear condensation and fragmentation is known as:

A)Necrosis

B)Chromatolysis

C)Pyknosis

D)+Apoptosis

21.True for reversible cell injury:

A)Formation of small amorphous densities in the mitochondrial matrix

B)Dilation of the ER

C)Formation of blebs in the plasma membrane

D)+All of the above

22.Which of the following inflammatory mediator does NOT cause fever?

A)+Nitric oxide

B)Prostaglandin

C)IL-1

D)TNF-alpha

23.Von Brunn nest is seen in:

A)+Normal urothelium

B)Transitional cell carcinoma

C)Squamous cell carcinoma

D)Adenocarcinoma

24.N-MYC amplification is associated with which tumor:

A)Burkitt lymphoma

B)Squamous cell carcinoma lung

C)Astrocytoma

D)+Neuroblastoma

25.The cell most sensitive to ischemia is:

A)Myocardial fibers

B)Glial cells of brain

C)Renal tubular epithelium

D)+Cortical neuron

26.The percentage of pulmonary emboli, that proceed to pulmonary infarction, is approximately:

A)0–5%

B)+5–15%

C)20–30%

D)30–40%

27.Myofibroblast is seen in:

A)Normal connective tissue

B)Muscle septa

C)+Wound margin

D)Bronchus

28.Articular cartilage is made up of:

A)Type I collagen

B)+Type II collagen

C)Type III collagen

D)Type IV collagen

29.Macrophages are seen in:

A)Early inflammation

B)+Chronic inflammation

C)Wound repair

D)Healing

30.Diabetic gangrene is due to:

A)Ischemia

B)Increased blood glucose

C)Altered host defence and neuropathy

D)+All of the above

31.Amyloidosis is associated with all of the following EXCEPT:

A)Multiple myeloma

B)Renal failure

C)Alzheimer’s disease

D)+Acute inflammatory conditions

32.Hypercalcemia is seen in ALL EXCEPT:

A)Bone metastasis

B)Sarcoidosis

C)+Pseudohypoparathyroidism

D)Hyperparathyroidism

33.NOT a component of Virchow triad:

A)Endothelial injury

B)Stasis

C)Hypercoagulable states

D)+Immunodeficiency

34.Most common site of venous thrombosis:

A)Veins of upper extremity

B)+Veins of lower extremity

C)Dural sinus

D)Portal vein

35.Invasive carcinoma differs from carcinoma in situ by:

A)Abnormal nuclear morphology

B)Pleomorphism

C)+Breached basement membrane

D)Mitoses

36.All of the following responses are seen in acute inflammation EXCEPT:

A)Vasodilatation

B)Neutrophil migration

C)+Granuloma formation

D)Increased vascular permeability

37.Epithelioid granuloma consists mainly of which type of cells?

A)B cells

B)T cells

C)Monocytes

D)+Macrophages

38.Apoptosis means:

A)Regeneration of cells after injury

B)Reperfusion injury of the cells

C)+Programmed internal cell death

D)Uncontrolled multiplication of cells

39.Red infarct is seen in:

A)Kidney

B)Heart

C)Brain

D)+Small intestine

40.Metastatic calcification does NOT occurs in:

A)+Fundal glands of intestine

B)Renal tubules

C)Lungs alveoli

D)Blood vessels

41.Congo red staining for amyloid under polarized light shows:

A)Silver birefringence

B)Golden birefringence

C)Blue birefringence

D)+Green birefringence

42.All of the following are tumor suppressor genes EXCEPT:

A)NF1

B)pRb

C)+SMAD1

D)p53

43.Following are the examples of apoptosis EXCEPT:

A)Graft versus host disease

B)Menstrual cycle

C)Pathological atrophy following duct obstruction

D)+Tumour necrosis

44.Hyaline arteriolosclerosis is seen in which of the following conditions?

A)Tuberculosis

B)+Hypertension

C)Syphilis

D)Leprosy

45.Stain used to diagnose amyloidosis:

A)Methylene blue

B)Acid fast stain

C)Rose bengal

D)+Congo red

46.Call-exner bodies are seen in:

A)Theca cell tumour

B)Yolk sac tumour

C)+Granulosa cell tumour

D)Fibroma of ovary

47.If calcium levels are normal, which type of calcification is seen?

A)Metastatic

B)+Dystrophic

C)Dysplastic

D)Metaplastic

48.Metastatic calcification is seen in:

A)Cysts

B)Atheroma

C)+Normal tissues

D)Infarcts

49.Myositis ossificans is differentiated from other reactive fibroblastic proliferations by the presence of:

A)Dysplastic bone

B)Dystrophic bone

C)+Metaplastic bone

D)Hypertrophic bone

50.Extracellular hyaline change is seen in:

A)+Arteriosclerosis

B)Chronic glomerulonephritis

C)Leiomyoma

D)Alcoholic hyaline

51.First change seen in acute inflammation is:

A)Increased permeability

B)Vasodilatation

C)Neutrophil migration

D)+Vasoconstriction

52.Lymph node biopsy of an AIDS patient shows:

A)Warthin-Finkeldey cells

B)Marked follicular hyperplasia

C)Moth-eaten appearance

D)+All of the above

53.Amyloid is stained with:

A)Lugol’s iodine

B)Methyl violet

C)+Congo red

D)Sudan black

54.Reactionary hemorrhage occur within:

A)+24 hours

B)1–2 days

C)2–4 days

D)4–6 days

55.Which of the following is NOT a feature of red infarction?

A)Venous occlusion

B)Occurs in organs having dual circulation

C)+Occurs in solid organs

D)Occurs in previously congested tissues

56.Which of the following is ultrastructural feature of irreversible cell injury?

A)Formation of phagolysosomes

B)+Formation of amorphous densities in the mitochondrial matrix

C)Formation of blebs in the plasma membrane

D)Detachment of ribosomes from rough endoplasmic reticulum

57.Which of the following inflammatory mediator does NOT cause fever?

A)+Nitric oxide

B)Prostaglandin

C)IL-1

D)TNF-alpha

58.Caspases are important in:

A)Cell regeneration

B)Necrosis

C)Nerve regeneration

D)+Apoptosis

59.Malignant tumours differ from benign tumours in the fact that they:

A)+Are poorly circumscribed

B)Retain polarity

C)Are small in size

D)Are slow growing

60.Which of the following is FALSE statement for reversible cell injury?

A)Reduced generation of ATPs

B)Membranous bleb formation

C)+Nuclear chromatin condensation

D)Detachment of ribosomes from the granular endoplasmic reticulum

61.Which of the following is the earliest feature of reversible cell injury?

A)Amorphous densities

B)Ribosomal detachment

C)+Hydropic swelling

D)Bleb formation

62.Which of the following is NOT a site for fat necrosis?

A)Pancreas

B)+Liver

C)Peritoneum

D)Breast

63.All of the following may show cell swelling EXCEPT:

A)Infection

B)Malignancy

C)+Pathologic calcification

D)Hypoxia

64.All of the following are sure sign of malignancy EXCEPT:

A)+Chromosomal diploidy

B)Pleomorphism

C)Anisonucleosis

D)Tumour giant cells

65.All are causes of dystrophic calcification EXCEPT:

A)Necrosis

B)+Milk alkali syndrome

C)Dead parasites

D)Calcinosis cutis

66.Lardaceous spleen is due to deposition of:

A)Hemosiderin

B)Lipofuscin

C)+Amyloid in red pulp

D)Amyloid in white pulp

67.Which of the following is NOT associated with deep venous thrombosis?

A)+Epithelial injury

B)Platelets

C)Hypercoagulability

D)Altered blood flow

68.Dystrophic calcification is seen in:

A)Hyperparathyroidism

B)Multiple myeloma

C)+Atheromatous plaque

D)Prolonged immobilization

69.Uterus size increase by:

A)Hypertrophy

B)Hyperplasia

C)+Both

D)None

70.Proto-oncogene for gastrointestinal stromal tumour / GIST:

A)N-myc

B)C-myc

C)L-myc

D)+c-KIT

71.Hallmark of acute inflammation:

A)Vasoconstriction

B)Macrophages

C)Exudate

D)+Increased vascular permeability

72.Leukotrienes are produced due to:

A)Cyclo-oxygenase pathway

B)+Lipo-oxygenase pathway

C)Both

D)None

73.All of the following inflammatory mediators cause pain EXCEPT:

A)Serotonin

B)Histamine

C)+Nitric oxide

D)Vasoactive intestinal polypeptide

74.Which of the following condition is least associated with increased risk of malignancy?

A)Metaplasia

B)Dysplasia

C)Hyperplasia

D)+Hypertrophy

75.Secondary amyloidosis may occur in:

A)Alzheimer’s disease

B)Chronic renal failure

C)Type 2 DM

D)+Rheumatoid arthritis

76.Which of the following indicates malignant neoplasm?

A)Extremely scanty mitoses

B)+Increased nuclear to cytoplasm ratio

C)Normal configuration of cell

D)All of the above

77.In apoptosis, protein hydrolysis is due to activation of:

A)Upases

B)Transcarboxylase

C)Catalase

D)+Caspases

78.Type of necrosis associated with ischemia:

A)Fat necrosis

B)Liquefactive necrosis

C)Caseous necrosis

D)+Coagulative necrosis

79.NOT an auto-immune disease:

A)Grave’s disease

B)Systemic lupus erythematosus

C)Goodpasture syndrome

D)+Sickle cell anemia

80.In a lung tissue, it was noticed that normal epithelium is replaced by squamous type of epithelium. This is known as:

A)Anaplasia

B)Hyperplasia

C)Hypertrophy

D)+Metaplasia

81.Which of the following breast carcinoma gene is located on chromosome 17?

A)+BRCA1

B)BRCA2

C)p53

D)CHEK-2

82.Trisomy 18 is known as:

A)Down syndrome

B)Turner syndrome

C)+Edward syndrome

D)Klinefelter syndrome

83.Which of the following defines type II hypersensitivity reactions?

A)Mast cell degranulation

B)Immune complex deposits

C)Delayed cell immunity

D)+Antigen antibody reaction

84.Which of the following is a tumour suppressor gene?

A)C-MYC

B)N-MYC

C)L-MYC

D)+BRCA1 and 2

85.Cause of exudate:

A)Increased hydrostatic pressure

B)+Increased vascular permeability

C)Decreased oncotic pressure

D)Decreased proteins

86.Feature of irreversible cellular damage principally involves:

A)+Mitochondria

B)Lysosome

C)Cytoplasm

D)Golgi apparatus

87.MHC class I is expressed on:

A)All cells

B)RBCs

C)WBCs

D)+All nucleated cells

88.Which of the following helps in opsonization?

A)C3a

B)+C3b

C)C5a

D)C5b

89.Chemotaxis is brought about by:

A)C2a

B)C3b

C)+C5a

D)C5b

90.A substance which can change the genetic content of a cell is known as:

A)Genome

B)+Mutagen

C)Carcinogen

D)Histone

91.Caspases are involved in:

A)Mutagenesis

B)Carcinogenesis

C)Transduction

D)+Apoptosis

92.MHC independent killing is done by:

A)B cells

B)T cells

C)+NK cells

D)All of the above

93.BRCA1 is located on:

A)13q

B)13p

C)17p

D)+17q

94.In FNAC, what is taken for study?

A)+Cells

B)Urine sample

C)Part of tissue for culture

D)Blood sample

95.Cystic fibrosis inheritance:

A)AD

B)+AR

C)XLR

D)XLD

96.All are cellular adaptations EXCEPT:

A)Hypertrophy

B)Hyperplasia

C)Metaplasia

D)+Necrosis

97.Stain used for staining heart failure cells:

A)Alcian blue

B)Periodic acid Schiff

C)+Prussian blue

D)Methenamine silver

98.Which type of necrosis is observed in pyogenic infection and brain infarction?

A)+Liquefactive

B)Caseous

C)Fat

D)Coagulative

99.Which of the following is NOT a pro-inflammatory cytokine?

A)IL-12

B)+IL-10

C)IL-8

D)TNF-alpha

100.Liquefactive necrosis is seen in:

A)Bronchi

B)+Brain

C)Kidney

D)Heart

101.Marker for carcinoma colon is:

A)AFP

B)CA-125

C)+CEA

D)hCG

102.Alpha fetoprotein (AFP) is raised in:

A)Renal carcinoma

B)Pancreatic carcinoma

C)Prostatic carcinoma

D)+Hepatic carcinoma

103.CA-125 is marker for:

A)Breast cancer

B)+Ovarian cancer

C)Pancreatic cancer

D)Colon cancer

104.Tumor marker related to both colon carcinoma and pancreatitis:

A)CA-125

B)+CA-19-9

C)CD-15-3

D)All of the above

105.CA 19-9 is a marker for which of the following?

A)+Pancreatic carcinoma

B)Breast carcinoma

C)Ovarian carcinoma

D)Lung carcinoma

106.Medullary carcinoma of thyroid is associated with increase in:

A)+Calcitonin

B)Thyroglobulin

C)T3

D)T4

107.A patient presented with fever, night sweats and weight loss. Clinical examination revealed painless lymphadenopathy. Microscopy shows Reed-Sternberg cells. Most likely condition is:

A)HIV

B)Chronic lymphocytic leukemia

C)+Hodgkin’s lymphoma

D)Secondary TB

108.Bence-Jones protein is:

A)Monoclonal heavy chains

B)+Monoclonal light chains

C)Both of above

D)None of the above

109.Marker for carcinoma colon is:

A)AFP

B)CA-125

C)+CEA

D)hCG

110.AFP (alpha feto protein) is raised in:

A)Renal carcinoma

B)Pancreatic carcinoma

C)Prostatic carcinoma

D)+Hepatic carcinoma

111.CA-125 is marker for:

A)Breast cancer

B)+Ovarian cancer

C)Pancreatic cancer

D)Colon cancer

112.Tumor marker related to both colon carcinoma and pancreatic carcinoma:

A)CA-125

B)+CA-19-9

C)CD-15-3

D)All of the above

113.All of the following are true regarding G6PD deficiency EXCEPT:

A)A recessive X-linked trait

B)+Females are commonly affected

C)Oxidative stress causes hemolysis

D)Protective against plasmodium falciparum malaria

114.CD-15 helps in assessment of which of the following?

A)Adult T-cell leukemia

B)+Hodgkin’s disease

C)Mycosis fungoides

D)Large granular lymphocytic leukemia

115.CEA is elevated in all of the following EXCEPT:

A)Alcoholic cirrhosis

B)Ulcerative colitis

C)Carcinoma colon

D)+Prostatic carcinoma

116.Alpha fetoprotein is raised in ALL EXCEPT:

A)Teratocarcinoma

B)+Down syndrome

C)Embryonal cell carcinoma

D)Hepatocellular carcinoma

117.CA 19-9 is a marker for which of the following?

A)+Pancreatic carcinoma

B)Breast carcinoma

C)Ovarian carcinoma

D)Lung carcinoma

118.Tumour marker for trophoblastic tumours:

A)AFP

B)CEA

C)CA-125

D)+Beta-hCG

119.Diagnosis of a case who had >10% myeloma cells in marrow with lytic lesions of skull and presence of M-protein in serum:

A)Smoldering myeloma

B)+Multiple myeloma

C)Monoclonal gammopathy of unknown significance

D)Non-secretory myeloma

120.Which of the following diseases with oral ulceration, may show absence of auto-antibodies?

A)+Behcet disease

B)SLE

C)Pemphigus

D)Celiac disease

121.Normal value of HDL cholesterol should be more than:

A)+50 mg/dL

B)100 mg/dL

C)150 mg/dL

D)200 mg/dL

122.A young lady presented with cauliflower like growth around vulva. It may be caused by:

A)HIV

B)+HPV

C)HBV

D)HTLV

123.Gold standard for determining toxin type in Clostridium botulinum is bio-assay on:

A)Rabbits

B)+Mice

C)Hamster

D)Guinea pigs

124.ESR is decreased in:

A)Multiple myeloma

B)TB

C)+Polycythemia

D)Rheumatoid arthritis

125.A patient lacks the ability to activate $CD8^+$ T cells in response to viral infection. Which molecular defect is most likely responsible?

A) Absence of MHC class II expression

B)+Defect in TAP transporter proteins (↓ MHC class I)

C) CD40 ligand deficiency

D) Failure of immunoglobulin class switching

126.Which cytokine is essential for differentiation of naïve $CD4^+$ T cells into Th1 cells?

A) IL-4

B) IL-5

C)+IL-12

D) TGF-β

127.Cross-presentation of antigens is primarily performed by:

A) B lymphocytes

B) Macrophages

C)+Dendritic cells

D) Plasma cells

128.A patient develops hemolytic anemia after receiving incompatible blood. Which mechanism is responsible for the tissue injury?

A) IgE-mediated mast cell degranulation

B)+Antibody-dependent cellular cytotoxicity

C) Immune complex deposition

D) T-cell–mediated cytotoxicity

129.Which hypersensitivity reaction is most responsible for post-streptococcal glomerulonephritis?

A) Type I

B) Type II

C)+Type III

D) Type IV

130.Loss of peripheral tolerance is most closely associated with dysfunction of:

A) Central deletion

B) AIRE gene

C)+Regulatory T cells

D) B-cell receptor editing

131.Chronic rejection of a kidney transplant is primarily characterized by:

A) Acute neutrophilic infiltration

B) Immune complex deposition in glomeruli

C)+Progressive intimal fibrosis of vessels

D) Preformed anti-donor antibodies

132.A child presents with severe viral, fungal, and protozoal infections. Genetic analysis reveals a mutation in the common γ-chain of cytokine receptors. Which condition is most likely?

A) DiGeorge syndrome

B)+SCID

C) Bruton agammaglobulinemia

D) Wiskott–Aldrich syndrome

133.A patient with selective IgA deficiency develops anaphylaxis after plasma transfusion. The reaction is mediated by:

A) IgE against donor antigens

B)+Anti-IgA antibodies

C) Complement activation

D) Immune complexes

134.HIV preferentially infects cells using which co-receptors?

A)+CXCR4 and CCR5

B) CD28 and CD40

C) IL-2 receptor

D) CD8

135.AA amyloidosis is most commonly associated with:

A) Plasma cell dyscrasias

B)+Chronic inflammatory diseases

C) Alzheimer disease

D) Long-term dialysis

136.Which genetic alteration converts a proto-oncogene into an oncogene?

A) Loss-of-function mutation

B)+Gene amplification

C) Promoter methylation

D) Deletion of tumor suppressor gene

137.Anaplasia in malignant tumors is best defined as:

A) Increased mitotic rate

B)+Loss of differentiation and cellular polarity

C) Tumor encapsulation

D) Metastatic potential

138.The ability of cancer cells to evade apoptosis is most commonly associated with mutation of:

A) RAS

B) MYC

C)+BCL-2

D) APC

139.Which carcinogenic agent acts as a complete carcinogen?

A) Asbestos

B)+Aflatoxin B1

C) UV radiation

D) Alcohol

140.Paraneoplastic syndromes are best explained by:

A) Tumor invasion

B) Metastatic spread

C)+Hormone or cytokine production by tumors

D) Immune complex deposition

141.Which inheritance pattern is most consistent with variable expressivity and incomplete penetrance?

A) Autosomal recessive

B) X-linked recessive

C)+Autosomal dominant

D) Mitochondrial

142.Septic shock is primarily caused by:

A) Direct bacterial invasion

B)+Endotoxin-mediated cytokine storm

C) Antibody deficiency

D) Immune complex deposition

143.Which pathogen causes disease mainly through exotoxin production?

A) Mycobacterium tuberculosis

B)+Corynebacterium diphtheriae

C) Chlamydia trachomatis

D) Plasmodium falciparum

144.Marasmus differs from kwashiorkor by:

A) Presence of edema

B) Isolated protein deficiency

C)+Combined calorie and protein deficiency

D) Fatty liver

145.Failure of negative selection in the thymus is most likely due to mutation in:

A) RAG genes

B)+AIRE gene

C) BTK gene

D) FOXP3

146.Which immunologic mechanism underlies contact dermatitis?

A) IgE-mediated reaction

B) Immune complex deposition

C)+Cytotoxic T-cell response

D) Complement-mediated lysis

147.Which cytokine promotes B-cell class switching to IgE?

A) IFN-γ

B) IL-2

C)+IL-4

D) IL-12

148.Anti-dsDNA antibodies are most strongly associated with:

A) Rheumatoid arthritis

B) Scleroderma

C)+Systemic lupus erythematosus

D) Sjögren syndrome

149.Graft-versus-host disease occurs most commonly after:

A) Kidney transplantation

B) Liver transplantation

C)+Bone marrow transplantation

D) Heart transplantation

150.Which cell type is primarily responsible for acute cellular rejection?

A) B lymphocytes

B) Plasma cells

C)+$CD8^+$ T cells

D) Neutrophils

151.A child with eczema, recurrent infections, and thrombocytopenia most likely has mutation in:

A) BTK

B)+WAS gene

C) ADA

D) IL-2 receptor

152.Opportunistic infections in AIDS patients occur primarily due to loss of:

A) B-cell function

B) Neutrophils

C)+$CD4^+$ T cells

D) Complement

153.Dialysis-related amyloidosis is caused by deposition of:

A) AA protein

B) AL protein

C)+β2-microglobulin

D) Transthyretin

154.Which hallmark of cancer allows cells to replicate unlimited?

A) Sustained angiogenesis

B) Tissue invasion

C) Evasion of apoptosis

D)+Telomerase activation

155.Tumor suppressor gene RB regulates the cell cycle at:

A) G2–M checkpoint

B) S phase

C)+G1–S checkpoint

D) M phase

156.Which mechanism best explains chromosomal instability in cancer cells?

A) Point mutation

B)+Defective DNA repair

C) Epigenetic silencing

D) Loss of apoptosis

157.Anticipation is most commonly associated with:

A) Missense mutations

B)+Trinucleotide repeat expansion

C) Frameshift mutations

D) Deletions

158.Turner syndrome karyotype is:

A) 47,XXY

B) 47,XXX

C)+45,X

D) 46,XX

159.Which pediatric disease results from failure of neural crest cell migration?

A) Cystic fibrosis

B)+Hirschsprung disease

C) Phenylketonuria

D) Hemophilia A

160.Granuloma formation is most characteristic of infection with:

A) Streptococcus pneumoniae

B) Staphylococcus aureus

C)+Mycobacterium tuberculosis

D) Neisseria meningitidis

161.Which vitamin deficiency causes pellagra?

A) Vitamin B1

B)+Vitamin B3

C) Vitamin B6

D) Vitamin C

162.Protein-energy malnutrition causes immunodeficiency mainly by:

A) Reduced complement synthesis

B)+Impaired T-cell–mediated immunity

C) Increased IgE production

D) Neutrophilia

163.Which pathogen most commonly causes sepsis in immunocompromised patients?

A)+Candida species

B) Influenza virus

C) Giardia lamblia

D) Entamoeba histolytica

164.Which factor increases cancer risk by promoting chronic inflammation?

A) Smoking

B) UV radiation

C)+Helicobacter pylori infection

D) Ionizing radiation

165. Which cell is the most potent antigen-presenting cell for naïve T cells?

A) Macrophage

B) B lymphocyte

C)+Dendritic cell

D) Neutrophil

E) NK cell

166. MHC class I molecules present antigen to:

A) $CD4^+$ T cells

B)+$CD8^+$ T cells

C) B cells

D) Plasma cells

E) NK cells

167. Which cytokine is essential for T-cell proliferation?

A) IL-1

B)+IL-2

C) IL-4

D) IL-10

E) TNF-α

168. Which immunoglobulin is produced first in a primary immune response?

A) IgA

B) IgD

C) IgE

D) IgG

E)+IgM

169. Central tolerance of T lymphocytes occurs in the:

A) Bone marrow

B) Spleen

C)+Thymus

D) Lymph node

E) Tonsils

170. Which complement component is the most important opsonin?

A) C1q

B) C2a

C)+C3b

D) C5a

E) C9

171. Antibody-dependent cellular cytotoxicity (ADCC) is primarily mediated by:

A) Neutrophils

B) Macrophages

C)+NK cells

D) $CD4^+$ T cells

E) B cells

172. Which immunoglobulin is the major antibody in mucosal secretions?

A) IgG

B) IgM

C)+IgA

D) IgE

E) IgD

173. Which process increases antibody affinity during an immune response?

A) Class switching

B) Complement activation

C)+Somatic hypermutation

D) Central tolerance

E) Clonal deletion

174. Which immune organ lacks afferent lymphatic vessels?

A) Lymph node

B) Thymus

C)+Spleen

D) Tonsil

E) Peyer patch

175. A 6-year-old child has recurrent viral infections. Laboratory testing shows absence of $CD8^+$ T-cell activation due to defective antigen presentation. Which molecule is most likely affected?

A) MHC class II

B) CD4

C)+MHC class I

D) CD28

E) CD40

176. A patient develops severe infections after thymectomy in early childhood. Which immune function is most impaired?

A) Antibody production

B) Complement activation

C)+Cell-mediated immunity

D) Neutrophil phagocytosis

E) NK cell function

177. A vaccine induces long-lasting protection by generating high-affinity antibodies. Which mechanism is responsible?

A) Isotype switching

B)+Somatic hypermutation

C) Central tolerance

D) Apoptosis

E) Complement fixation

178. A child with recurrent bacterial infections has defective opsonization. Which complement component deficiency is most likely?

A) C1

B)+C3

C) C5

D) C7

E) C9

179. A newborn lacks Peyer patches. Which immune function is primarily compromised?

A) Systemic humoral immunity

B) Cell-mediated immunity

C)+Mucosal immunity

D) NK cell activity

E) Central tolerance

180. A researcher blocks IL-2 signaling in T lymphocytes. What is the most likely consequence?

A) Increased antibody production

B)+Decreased T-cell proliferation

C) Enhanced macrophage activation

D) Increased IgE synthesis

E) Complement inhibition

181. A patient has a mutation affecting CD40L. Which immune process is impaired?

A) Antigen presentation

B) T-cell selection

C)+Class switching in B cells

D) Complement activation

E) NK cell cytotoxicity

182. A spleen is removed after trauma. Which infection risk increases most?

A) Viral infections

B) Fungal infections

C)+Encapsulated bacterial infections

D) Protozoal infections

E) Helminthic infections

183. A patient has selective IgA deficiency. Which symptom is most likely?

A) Severe viral infections

B)+Recurrent mucosal infections

C) Autoimmune hemolytic anemia

D) Delayed wound healing

E) Recurrent parasitic infections

184. A mutation prevents negative selection of T cells in the thymus. What is the most likely outcome?

A) Immunodeficiency

B) Allergy

C)+Autoimmune disease

D) Recurrent infections only

E) NK cell hyperactivity

185. Type I hypersensitivity is mediated primarily by:

A) IgG

B) IgM

C)+IgE

D) Immune complexes

E) T lymphocytes

186. Contact dermatitis is classified as which type of hypersensitivity?

A) Type I

B) Type II

C) Type III

D)+Type IV

E) Type V

187. Which hypersensitivity reaction involves immune complex deposition?

A) Type I

B) Type II

C)+Type III

D) Type IV

E) None

188. Anti-dsDNA antibodies are most strongly associated with:

A) Rheumatoid arthritis

B)+Systemic lupus erythematosus

C) Scleroderma

D) Sjögren syndrome

E) Polymyositis

189. Which cell type is primarily responsible for delayed-type hypersensitivity?

A) B lymphocyte

B) Mast cell

C) Neutrophil

D)+$CD4^+$ Th1 cell

E) $CD8^+$ T cell

190. Hyperacute transplant rejection occurs due to:

A) T-cell activation

B) Immune complexes

C)+Preformed antibodies

D) NK-cell activity

E) Complement deficiency

191. Rheumatoid factor is best described as:

A) IgG against IgM

B)+IgM against IgG

C) IgA against IgE

D) IgE against IgG

E) IgD against IgM

192. Which HLA type is strongly associated with ankylosing spondylitis?

A) HLA-DR3

B) HLA-DR4

C)+HLA-B27

D) HLA-A3

E) HLA-DQ2

193. Chronic transplant rejection is characterized by:

A) Acute inflammation

B)+Intimal fibrosis

C) Immune complex deposition

D) Neutrophilic infiltration

E) Edema

194. Which cytokine has a predominantly anti-inflammatory effect?

A) IL-2

B) IFN-γ

C) TNF-α

D)+IL-10

E) IL-12

195. A patient develops wheezing, urticaria, and hypotension minutes after a bee sting. Which immunologic mechanism is responsible?

A) Immune complex deposition

B) IgG-mediated cytotoxicity

C)+IgE-mediated mast cell degranulation

D) T-cell–mediated cytotoxicity

E) Complement deficiency

196. A patient develops a pruritic rash 48 hours after exposure to nickel jewelry. Which immune mechanism is involved?

A) Antibody-mediated cytotoxicity

B) Immune complex deposition

C) IgE-mediated reaction

D)+T-cell–mediated delayed hypersensitivity

E) Complement activation

197. A woman with SLE presents with hematuria and proteinuria. Which pathogenic mechanism explains renal injury?

A) Direct antibody-mediated cytotoxicity

B)+Immune complex deposition

C) IgE-mediated mast cell activation

D) T-cell apoptosis

E) NK-cell cytotoxicity

198. A patient develops graft failure minutes after kidney transplantation. The most likely cause is:

A) Acute cellular rejection

B) Chronic rejection

C)+Pre-existing recipient antibodies

D) Graft-versus-host disease

E) Opportunistic infection

199. A patient with myasthenia gravis improves after plasmapheresis. This suggests the disease is mediated by:

A) Immune complexes

B) IgE antibodies

C)+Circulating autoantibodies

D) $CD8^+$ T cells

E) NK cells

200. A patient presents with hemoptysis and hematuria. Anti-basement membrane antibodies are detected. Which antigen is targeted?

A) DNA

B)+Collagen type IV

C) Myelin basic protein

D) Acetylcholine receptor

E) Insulin receptor

201. A bone marrow transplant recipient develops rash, diarrhea, and liver dysfunction. What is the underlying mechanism?

A) Host immune attack on graft

B) Antibody-mediated rejection

C)+Graft immune cells attacking host tissues

D) Immune complex deposition

E) Complement activation

202. A patient has symmetric joint pain, positive rheumatoid factor, and anti-CCP antibodies. Which hypersensitivity type is involved?

A) Type I

B) Type II

C)+Type III

D) Type IV

E) Type V

203. A woman with Graves disease has hyperthyroidism due to antibodies that:

A) Destroy thyroid cells

B) Block TSH receptor

C)+Stimulate TSH receptor

D) Form immune complexes

E) Activate complement

204. Which immune mechanism is most responsible for acute cellular rejection of a transplanted organ?

A) IgM antibodies

B) Immune complexes

C)+$CD8^+$ T-cell–mediated cytotoxicity

D) NK-cell activity

E) Mast cell degranulation

205. Severe combined immunodeficiency (SCID) primarily affects:

A) B cells only

B) T cells only

C) +Both T and B cells

D) NK cells only

E) Neutrophils

206. The most common cause of X-linked SCID is deficiency of:

A) ADA

B) RAG1

C) +Common γ-chain (IL-2 receptor)

D) CD40L

E) BTK

207. Bruton agammaglobulinemia is caused by mutation in:

A) ADA

B) +BTK

C) RAG2

D) CD3

E) ZAP-70

208. DiGeorge syndrome results from abnormal development of:

A) First pharyngeal pouch

B) Second pharyngeal pouch

C) +Third and fourth pharyngeal pouches

D) Fifth pharyngeal arch

E) Neural tube

209. The most common primary immunodeficiency is:

A) SCID

B) DiGeorge syndrome

C) Chronic granulomatous disease

D) +Selective IgA deficiency

E) Hyper-IgM syndrome

210. Which immunoglobulin is most decreased in selective IgA deficiency?

A) IgG

B) IgM

C) +IgA

D) IgE

E) IgD

211. HIV primarily infects cells expressing:

A) CD8

B) CD19

C) CD20

D) +CD4

E) CD56

212. Congo red–positive amyloid deposits show which appearance under polarized light?

A) Blue fluorescence

B) +Apple-green birefringence

C) Red fluorescence

D) Yellow granules

E) Black pigmentation

213. Secondary amyloidosis is associated with increased deposition of:

A) AL protein

B) β-amyloid

C) +AA protein

D) Transthyretin

E) Calcitonin

214. The most common cause of acquired immunodeficiency worldwide is:

A) Malignancy

B) Malnutrition

C) +HIV infection

D) Chemotherapy

E) Aging

215. A 3-month-old infant has recurrent bacterial, viral, and fungal infections. Chest X-ray shows absence of thymic shadow. Which diagnosis is most likely?

A) Bruton agammaglobulinemia

B) +DiGeorge syndrome

C) Selective IgA deficiency

D) Chronic granulomatous disease

E) Hyper-IgM syndrome

216. A male infant presents with recurrent infections after 6 months of age. Serum immunoglobulins are markedly reduced. Flow cytometry shows absence of B cells. Which gene is most likely mutated?

A) ADA

B) +BTK

C) RAG1

D) CD40

E) IL-2 receptor

217. A child has hypocalcemia, congenital heart defects, and recurrent viral infections. Which embryologic defect is responsible?

A) Neural crest migration failure

B) +Abnormal third and fourth pharyngeal pouch development

C) Failure of thymic negative selection

D) Bone marrow aplasia

E) Defective class switching

218. A patient with chronic osteomyelitis develops renal amyloidosis. Which protein is deposited?

A) AL

B) +AA

C) β-amyloid

D) Transthyretin

E) Immunoglobulin M

219. A patient with HIV has a CD4 count of 180 cells/μL. Which infection is most likely?

A) Streptococcus pneumoniae

B) +Candida esophagitis

C) Toxoplasmosis

D) CMV retinitis

E) Mycobacterium avium complex

220. A patient with long-standing multiple myeloma develops restrictive cardiomyopathy due to amyloid deposition. Which amyloid type is involved?

A) AA

B) β-amyloid

C) +AL

D) ATTR

E) Aβ2M

221. A child with recurrent catalase-positive infections has a normal nitroblue tetrazolium test turning negative. Which condition is most likely?

A) Chediak–Higashi syndrome

B) +Chronic granulomatous disease

C) Leukocyte adhesion deficiency

D) SCID

E) DiGeorge syndrome

222. A patient with HIV develops Kaposi sarcoma. The causative virus is:

A) EBV

B) HPV

C) +HHV-8

D) CMV

E) HBV

223. A patient with selective IgA deficiency receives a blood transfusion and develops anaphylaxis. This is due to:

A) IgE antibodies

B) +Anti-IgA antibodies

C) Immune complex disease

D) Complement activation

E) T-cell activation

224. Protein-energy malnutrition causes immunodeficiency mainly by impairing:

A) Antibody production

B) Complement synthesis

C) Neutrophil migration

D) +Cell-mediated immunity

E) NK cell activity

225. A malignant tumor of mesenchymal origin is called:

A) Carcinoma

B) Adenoma

C) +Sarcoma

D) Lymphoma

E) Papilloma

226. Which feature best distinguishes malignant from benign tumors?

A) Encapsulation

B) Slow growth

C) +Metastasis

D) Differentiation

E) Hormone dependence

227. Which gene class normally inhibits cell cycle progression?

A) Proto-oncogenes

B) Oncogenes

C) +Tumor suppressor genes

D) DNA repair genes

E) Apoptosis genes

228. Loss of function of which gene is most commonly associated with human cancers?

A) RAS

B) MYC

C) +p53

D) HER2

E) BCR-ABL

229. Which hallmark of cancer enables unlimited replication potential?

A) Angiogenesis

B) Evasion of apoptosis

C) Sustained proliferative signaling

D) +Telomerase activation

E) Immune evasion

230. Which mechanism converts a proto-oncogene into an oncogene?

A) Gene deletion

B) Loss of heterozygosity

C) +Gain-of-function mutation

D) Frameshift mutation

E) Promoter methylation

231. Which tumor suppressor gene regulates the G1/S checkpoint?

A) APC

B) BRCA1

C) p53

D) +RB

E) PTEN

232. Which carcinogen is classified as a complete carcinogen?

A) Asbestos

B) Aflatoxin B1

C) UV radiation

D) +Tobacco smoke

E) Nickel

233. Which process allows cancer cells to invade surrounding tissues?

A) Increased differentiation

B) +Loss of cell adhesion

C) Reduced mitosis

D) Increased apoptosis

E) Enhanced immune response

234. Which term describes variation in size and shape of tumor cells?

A) Dysplasia

B) Anaplasia

C) +Pleomorphism

D) Hyperplasia

E) Metaplasia

235. A lung tumor shows sheets of poorly differentiated cells with numerous mitoses and invasion of surrounding tissue. Which feature confirms malignancy?

A) Encapsulation

B) Necrosis

C) +Metastatic potential

D) Rapid growth

E) Increased angiogenesis

236. A patient with colon cancer has a mutation causing loss of both alleles of a tumor suppressor gene. This concept is best explained by:

A) Gain-of-function mutation

B) Oncogene activation

C) +Knudson two-hit hypothesis

D) Epigenetic modification

E) Gene amplification

237. A child with retinoblastoma inherits one defective RB gene. Tumor development requires:

A) +One additional mutation

B) Activation of MYC

C) Telomerase activation

D) Increased angiogenesis

E) Immune evasion

238. A tumor shows increased telomerase activity. Which hallmark of cancer does this represent?

A) Sustained angiogenesis

B) Tissue invasion

C) Evasion of growth suppressors

D) +Limitless replicative potential

E) Genome instability

239. A patient exposed to asbestos develops mesothelioma. This agent acts mainly by:

A) Direct DNA alkylation

B) +Inducing chronic inflammation

C) UV-induced pyrimidine dimers

D) Free radical scavenging

E) Hormonal stimulation

240. A smoker develops squamous cell carcinoma of the lung. Which genetic alteration is most likely involved?

A) Loss of p53

B) Gain of BRCA1

C) Inactivation of RB

D) Activation of RAS

E) +B and D

241. A breast cancer shows HER2/neu gene amplification. This leads to:

A) Loss of cell adhesion

B) +Increased growth factor signaling

C) Increased apoptosis

D) Reduced angiogenesis

E) Cell cycle arrest

242. Which mechanism best explains tumor angiogenesis?

A) Decreased VEGF

B) +Increased hypoxia-inducible factor (HIF)

C) Increased apoptosis

D) Reduced glucose uptake

E) Increased immune surveillance

243. A malignant tumor spreads via lymphatics to regional lymph nodes. This process is called:

A) Dysplasia

B) Invasion

C) Metaplasia

D) +Metastasis

E) Anaplasia

244. A tumor suppressor gene mutation differs from oncogene activation because it requires:

A) Single allele mutation

B) Gain-of-function mutation

C) +Two-hit inactivation

D) Gene amplification

E) Translocation

245. Which chemical carcinogen requires metabolic activation to become carcinogenic?

A) +Aflatoxin B1

B) Benzene

C) Asbestos

D) Nickel

E) Chromium

246. Ionizing radiation causes cancer mainly by inducing:

A) Thymine dimers

B) Single-strand breaks

C) +Double-strand DNA breaks

D) Gene amplification

E) RNA damage

247. Which virus is strongly associated with hepatocellular carcinoma?

A) EBV

B) HPV

C) +HBV

D) HTLV-1

E) CMV

248. Cachexia in cancer patients is mainly due to increased production of:

A) Insulin

B) Growth hormone

C) +TNF-α

D) Estrogen

E) Erythropoietin

249. Paraneoplastic syndromes occur due to:

A) Tumor metastasis

B) Direct tumor invasion

C) +Ectopic hormone production

D) Local inflammation

E) Necrosis

250. Which mode of inheritance is seen in cystic fibrosis?

A) Autosomal dominant

B) +Autosomal recessive

C) X-linked dominant

D) X-linked recessive

E) Mitochondrial

251. Marfan syndrome is caused by mutation in a gene encoding:

A) Collagen type I

B) Elastin

C) +Fibrillin-1

D) Keratin

E) Actin

252. Which disorder shows autosomal dominant inheritance with incomplete penetrance?

A) Phenylketonuria

B) Sickle cell anemia

C) +Neurofibromatosis type 1

D) Thalassemia major

E) Tay-Sachs disease

253. Which genetic mechanism explains variable expression of a disease among individuals with the same mutation?

A) Anticipation

B) Penetrance

C) +Expressivity

D) Mosaicism

E) Pleiotropy

254. Which enzyme deficiency causes phenylketonuria?

A) Tyrosinase

B) +Phenylalanine hydroxylase

C) Homogentisate oxidase

D) Galactose-1-phosphate uridyltransferase

E) Branched-chain ketoacid dehydrogenase

255. A patient receiving radiotherapy for lymphoma later develops acute leukemia. This is best explained by:

A) Viral carcinogenesis

B) Chemical carcinogenesis

C) +Radiation-induced DNA damage

D) Tumor progression

E) Immune suppression

256. A smoker presents with weight loss and hypercalcemia. No bone metastases are found. The most likely mechanism is:

A) Bone destruction

B) +PTHrP secretion

C) Vitamin D deficiency

D) Renal failure

E) Increased calcitonin

257. A child presents with tall stature, arachnodactyly, lens dislocation, and aortic dilation. What is the mode of inheritance?

A) Autosomal recessive

B) X-linked recessive

C) +Autosomal dominant

D) Mitochondrial

E) Polygenic

258. A newborn has phenylketonuria. If untreated, the most likely complication is:

A) Liver failure

B) Renal failure

C) +Severe intellectual disability

D) Cardiac defects

E) Deafness

259. A family shows progressive worsening of symptoms in successive generations. This phenomenon is called:

A) Pleiotropy

B) Expressivity

C) Penetrance

D) +Anticipation

E) Mosaicism

260. A patient has colon cancer at age 30 and multiple family members are affected. The most likely genetic defect is:

A) +APC mutation

B) p53 mutation

C) RB mutation

D) BRCA1 mutation

E) RET mutation

261. A tumor produces ACTH leading to Cushing syndrome. This is an example of:

A) Metastasis

B) Tumor progression

C) +Paraneoplastic syndrome

D) Cachexia

E) Oncogene activation

262. A child has albinism. Which mechanism is responsible?

A) Decreased melanocyte number

B) Failure of neural crest migration

C) +Decreased melanin synthesis

D) Increased melanin breakdown

E) Autoimmune destruction

263. A male child with hemophilia has a normal father and carrier mother. What is the inheritance pattern?

A) Autosomal recessive

B) Autosomal dominant

C) +X-linked recessive

D) X-linked dominant

E) Mitochondrial

264. Which genetic disease is caused by trinucleotide repeat expansion?

A) Cystic fibrosis

B) Sickle cell anemia

C) +Huntington disease

D) Phenylketonuria

E) Thalassemia

265. Which disorder is classically considered a multifactorial (polygenic) disease?

A) Cystic fibrosis

B) Sickle cell anemia

C) +Type 2 diabetes mellitus

D) Hemophilia A

E) Phenylketonuria

266. Down syndrome is most commonly caused by:

A) Robertsonian translocation

B) Mosaicism

C) +Meiotic nondisjunction

D) Deletion of chromosome 21

E) Ring chromosome

267. A karyotype 45,X is characteristic of:

A) Klinefelter syndrome

B) +Turner syndrome

C) Triple X syndrome

D) Edwards syndrome

E) Patau syndrome

268. Which chromosomal abnormality is associated with advanced maternal age?

A) Deletion

B) Inversion

C) Translocation

D) +Nondisjunction

E) Ring chromosome

269. A child with webbed neck, coarctation of aorta, and streak gonads most likely has:

A) 47,XXY

B) 47,XXX

C) +45,X

D) 46,XX

E) 46,XY

270. Which syndrome is caused by trisomy 18?

A) Down syndrome

B) Patau syndrome

C) +Edwards syndrome

D) Turner syndrome

E) Klinefelter syndrome

271. Which pediatric disease results from failure of neural crest cell migration?

A) Cystic fibrosis

B) +Hirschsprung disease

C) Phenylketonuria

D) Hemophilia

E) Congenital hypothyroidism

272. Which condition is associated with a “cat-like” cry in infancy?

A) Down syndrome

B) Turner syndrome

C) +Cri-du-chat syndrome

D) Edwards syndrome

E) Patau syndrome

273. Which chromosomal abnormality involves loss of genetic material?

A) Translocation

B) Duplication

C) Inversion

D) +Deletion

E) Nondisjunction

274. Which disorder is caused by imprinting defects on chromosome 15?

A) Fragile X syndrome

B) +Angelman syndrome

C) Klinefelter syndrome

D) Turner syndrome

E) Williams syndrome

275. A 38-year-old woman delivers a baby with hypotonia, flat facial profile, and a single palmar crease. What is the most likely genetic mechanism?

A) Mosaicism

B) Robertsonian translocation

C) +Meiotic nondisjunction

D) Deletion

E) Inversion

276. A male child presents with small testes, gynecomastia, and infertility. Karyotype analysis shows 47,XXY. Which condition is this?

A) Turner syndrome

B) +Klinefelter syndrome

C) Fragile X syndrome

D) Edwards syndrome

E) Patau syndrome

277. A newborn fails to pass meconium within 48 hours and has abdominal distension. What is the underlying defect?

A) Failure of neural tube closure

B) +Failure of neural crest cell migration

C) Absence of smooth muscle

D) Defective intestinal rotation

E) Atresia of colon

278. A child with trisomy 18 is most likely to have which clinical feature?

A) Polydactyly

B) +Rocker-bottom feet

C) Single palmar crease

D) Macroglossia

E) Hypercalcemia

279. A newborn has microcephaly, severe intellectual disability, cleft lip, and polydactyly. Which diagnosis is most likely?

A) Down syndrome

B) Edwards syndrome

C) +Patau syndrome

D) Turner syndrome

E) Williams syndrome

280. A child presents with intellectual disability, ataxia, inappropriate laughter, and seizures. Which genetic mechanism is involved?

A) Trisomy

B) +Genomic imprinting defect

C) Point mutation

D) Mitochondrial inheritance

E) X-linked recessive inheritance

281. A family has several members with hypertension, obesity, and type 2 diabetes. This pattern best represents:

A) Autosomal recessive inheritance

B) Autosomal dominant inheritance

C) X-linked inheritance

D) +Multifactorial inheritance

E) Mitochondrial inheritance

282. A child with Cri-du-chat syndrome has which chromosomal abnormality?

A) +Deletion of short arm of chromosome 5

B) Trisomy 21

C) Trisomy 18

D) Monosomy X

E) Translocation involving chromosome 14

283. A boy has developmental delay, large ears, macroorchidism, and autism spectrum features. Which condition is most likely?

A) Down syndrome

B) +Fragile X syndrome

C) Angelman syndrome

D) Klinefelter syndrome

E) Turner syndrome

284. A child is born with congenital heart disease and hypocalcemia. Which additional finding is most likely?

A) Increased thymic size

B) +Absence of thymus

C) Hyperplasia of parathyroids

D) Elevated IgA levels

E) Neutrophilia

285. Which factor is most important for the pathogenicity of bacteria?

A) Size of organism

B) +Ability to evade host immune response

C) Oxygen requirement

D) Shape of bacteria

E) Gram staining property

286. Granulomatous inflammation is most characteristically seen in:

A) Acute pyogenic infections

B) Viral infections

C) +Tuberculosis

D) Fungal sepsis

E) Parasitic infestation

287. Which cell type predominates in chronic inflammation?

A) Neutrophils

B) Eosinophils

C) +Lymphocytes

D) Mast cells

E) Basophils

288. Endotoxin is a component of:

A) Gram-positive bacterial cell wall

B) Mycoplasma membrane

C) Fungal capsule

D) +Gram-negative bacterial cell wall

E) Viral envelope

289. Which vitamin deficiency leads to pellagra?

A) Vitamin B1

B) Vitamin B2

C) +Vitamin B3

D) Vitamin B6

E) Vitamin B12

290. Protein-energy malnutrition primarily impairs which immune function?

A) Humoral immunity

B) Complement activation

C) Phagocytosis

D) +Cell-mediated immunity

E) Neutrophil migration

291. Which infection most commonly causes caseous necrosis?

A) Syphilis

B) +Tuberculosis

C) Typhoid fever

D) Diphtheria

E) Leprosy

292. Which nutritional deficiency causes scurvy?

A) Vitamin A

B) +Vitamin C

C) Vitamin D

D) Vitamin E

E) Vitamin K

293. Which mediator is mainly responsible for fever during infection?

A) Histamine

B) Bradykinin

C) +Prostaglandin E2

D) Leukotriene B4

E) Nitric oxide

294. Kwashiorkor is characterized by all EXCEPT:

A) Edema

B) Fatty liver

C) Growth retardation

D) Muscle wasting

E) +Hyperalbuminemia

295. A patient with pulmonary tuberculosis shows granulomas composed of epithelioid cells and Langhans giant cells. Which immune response is primarily involved?

A) Type I hypersensitivity

B) Humoral immunity

C) +Cell-mediated immunity

D) Complement activation

E) Antibody-dependent cytotoxicity

296. A malnourished child presents with edema, flaky paint dermatitis, and enlarged fatty liver. What is the most likely diagnosis?

A) Marasmus

B) Pellagra

C) +Kwashiorkor

D) Scurvy

E) Rickets

297. A patient develops septic shock due to gram-negative bacteremia. Which bacterial component is responsible?

A) Exotoxin

B) Peptidoglycan

C) +Lipopolysaccharide

D) Flagellin

E) Capsule

298. A child presents with diarrhea, dermatitis, and dementia. Which deficiency is responsible?

A) Vitamin B1

B) +Vitamin B3

C) Vitamin B6

D) Vitamin B12

E) Folate

299. A chronic infection shows macrophages, lymphocytes, plasma cells, and fibrosis. This best describes:

A) Acute inflammation

B) Suppurative inflammation

C) +Chronic inflammation

D) Fibrinous inflammation

E) Serous inflammation

300. A patient with severe malnutrition has recurrent viral and fungal infections. Which immune defect explains this?

A) Decreased antibody production

B) Defective complement system

C) +Impaired T-cell function

D) Neutropenia

E) Reduced IgE levels

301. A patient presents with night blindness and xerophthalmia. Which vitamin deficiency is responsible?

A) +Vitamin A

B) Vitamin C

C) Vitamin D

D) Vitamin E

E) Vitamin K

302. Which organism most commonly produces exotoxins?

A) Gram-negative bacilli

B) Mycobacteria

C) Spirochetes

D) +Gram-positive bacteria

E) Chlamydia

303. A child with rickets is most likely to have which laboratory finding?

A) Hypercalcemia

B) Hyperphosphatemia

C) +Hypocalcemia

D) Increased vitamin D

E) Increased parathyroid hormone suppression

304. A patient with typhoid fever develops ulceration of Peyer patches. Which type of necrosis is seen?

A) +Coagulative

B) Liquefactive

C) Caseous

D) Fat necrosis

E) Fibrinoid necrosis

305. The most common cause of intracellular fat accumulation in the liver is:

A) Viral hepatitis

B) +Alcohol abuse

C) Hemochromatosis

D) Wilson disease

E) Amyloidosis

306. Fatty change (steatosis) most commonly affects which organs?

A) Heart and spleen

B) Liver and kidney

C) +Liver and heart

D) Brain and liver

E) Pancreas and lung

307. Which intracellular accumulation is seen in alpha-1 antitrypsin deficiency?

A) Lipofuscin

B) Cholesterol

C) Glycogen

D) +Misfolded protein

E) Calcium

308. Lipofuscin is best described as:

A) Pathologic pigment from hemoglobin

B) Iron-containing pigment

C) +Wear-and-tear pigment

D) Exogenous pigment

E) Bile pigment

309. Which condition leads to excessive glycogen accumulation in hepatocytes?

A) +Diabetes mellitus

B) Wilson disease

C) Hemochromatosis

D) Amyloidosis

E) Fatty liver disease

310. Hemosiderin is composed mainly of:

A) Copper

B) Calcium

C) +Iron

D) Cholesterol

E) Bilirubin

311. Which stain is used to demonstrate iron in tissues?

A) PAS stain

B) Congo red

C) +Prussian blue

D) Sudan black

E) Oil Red O

312. Intracellular cholesterol accumulation is most characteristic of:

A) Fatty liver

B) +Xanthomas

C) Amyloidosis

D) Glycogen storage disease

E) Alpha-1 antitrypsin deficiency

313. Pathologic calcification occurring in dead or dying tissue with normal serum calcium is called:

A) Metastatic calcification

B) +Dystrophic calcification

C) Hyperparathyroid calcification

D) Nephrocalcinosis

E) Osteomalacia

314. Which pigment accumulates in chronic passive congestion of the lung?

A) Lipofuscin

B) Melanin

C) +Hemosiderin

D) Bilirubin

E) Carbon

315. A chronic alcoholic presents with hepatomegaly. Liver biopsy shows vacuolated hepatocytes. What is the most likely intracellular accumulation?

A) Glycogen

B) Cholesterol

C) +Triglycerides

D) Amyloid

E) Iron

316. A patient with emphysema has periodic acid–Schiff (PAS) positive globules in hepatocytes. Which disorder is responsible?

A) Wilson disease

B) Hemochromatosis

C) +Alpha-1 antitrypsin deficiency

D) Glycogen storage disease

E) Amyloidosis

317. A diabetic patient shows swollen hepatocytes with clear cytoplasm. What is the accumulated substance?

A) Fat

B) +Glycogen

C) Iron

D) Copper

E) Amyloid

318. Atherosclerotic plaques contain foam cells filled with which substance?

A) Triglycerides

B) Glycogen

C) +Cholesterol esters

D) Iron

E) Calcium phosphate

319. An elderly patient’s myocardial cells contain a brown granular pigment without functional impairment. This pigment is:

A) Melanin

B) Hemosiderin

C) +Lipofuscin

D) Bilirubin

E) Carbon

320. A patient with chronic hemolytic anemia develops iron overload in multiple organs. What is this condition called?

A) Wilson disease

B) +Secondary hemochromatosis

C) Primary amyloidosis

D) Hemosiderosis

E) Metastatic calcification

321. Congo red–positive extracellular deposits showing apple-green birefringence indicate accumulation of:

A) Lipid

B) Iron

C) +Amyloid

D) Glycogen

E) Calcium

322. A patient with old tuberculous lesions shows calcification in necrotic tissue. Serum calcium levels are normal. This is:

A) Metastatic calcification

B) +Dystrophic calcification

C) Osteoporosis

D) Nephrolithiasis

E) Hypervitaminosis D

323. In Wilson disease, which substance accumulates inside hepatocytes?

A) Iron

B) Cholesterol

C) +Copper

D) Calcium

E) Glycogen

324. Carbon accumulation in lung macrophages is most commonly seen in:

A) +Coal workers

B) Iron deficiency anemia

C) Fat embolism

D) Tuberculosis

E) Sarcoidosis

325. A 6-year-old child presents with bowed legs, delayed closure of fontanelles, and low serum calcium. Which deficiency is most likely?

A) Vitamin A

B) Vitamin C

C) +Vitamin D

D) Vitamin K

326. A chronic alcoholic presents with confusion, ophthalmoplegia, and ataxia. Which vitamin deficiency explains this presentation?

A) +Vitamin B1

B) Vitamin B3

C) Vitamin B6

D) Vitamin B12

327. A patient presents with bleeding gums, petechiae, and poor wound healing. Which vitamin deficiency is responsible?

A) Vitamin A

B) +Vitamin C

C) Vitamin D

D) Vitamin K

328. A malnourished patient has hyperpigmented dermatitis, diarrhea, and cognitive decline. Which vitamin is deficient?

A) Vitamin B1

B) Vitamin B2

C) +Vitamin B3

D) Vitamin B12

329. A patient with obesity has increased waist circumference and insulin resistance. Which adipokine involved in appetite regulation is most likely dysfunctional?

A) Ghrelin

B) +Leptin

C) Cortisol

D) Adiponectin

330. A premature infant develops hemolytic anemia and neurologic deficits. Which vitamin deficiency is the cause?

A) Vitamin A

B) Vitamin D

C) +Vitamin E

D) Vitamin K

331. A patient with chronic liver disease presents with prolonged prothrombin time and easy bruising. Which vitamin deficiency is most likely?

A) Vitamin A

B) Vitamin C

C) Vitamin D

D) +Vitamin K

332. A child with night blindness and xerophthalmia is deficient in which vitamin?

A) +Vitamin A

B) Vitamin B1

C) Vitamin C

D) Vitamin D

333. A severely obese patient has increased risk of hypertension, dyslipidemia, and type 2 diabetes. This cluster of findings best describes:

A) Cushing syndrome

B) +Metabolic syndrome

C) Marfan syndrome

D) PCOS

334. A patient presents with numbness, paresthesia, and macrocytic anemia. Which vitamin deficiency is responsible?

A) Vitamin B6

B) +Vitamin B12

C) Vitamin C

D) Vitamin D

335. An obese patient has low levels of adiponectin. What is the most likely consequence?

A) Increased insulin sensitivity

B) Decreased inflammation

C) +Increased insulin resistance

D) Decreased lipid accumulation

336. A patient on long-term broad-spectrum antibiotics develops bleeding tendency. Which vitamin deficiency is most likely?

A) Vitamin A

B) Vitamin C

C) Vitamin D

D) +Vitamin K

337. A child with delayed growth and frequent infections is found to have severe protein-energy malnutrition. Which immune defect is most likely?

A) Increased antibody production

B) +Impaired T-cell function

C) Complement overactivation

D) Increased IgE levels

338. An obese patient has fatty liver, hypertriglyceridemia, and insulin resistance. What is the most likely diagnosis?

A) Alcoholic liver disease

B) +Non-alcoholic fatty liver disease

C) Wilson disease

D) Hemochromatosis

339. A strict vegan presents with glossitis, anemia, and neurologic symptoms. Which vitamin deficiency is most likely?

A) Vitamin B6

B) Vitamin B9

C) +Vitamin B12

D) Vitamin C

340. HLA is located on?

A) +Short arm chromosome 6

B) Long arm chromosome 6

C) Short arm chromosome 3

D) Long arm chromosome 3

341. Find the incorrect match with regard to type of amyloid?

A) Chronic inflammation - AA

B) Familial mediterranean fever - AA

C) Familial amyloidotic polyneuropathy - ATTR

D) +Alzheimer's disease - A beta2

342. A 54-year old male is a patient of chronic renal failure and is currently on hemodialysis. Few months later he presents with wrist joint pain. Which of the following amyloid depositions best describes this phenomenon?

A) A beta

B) +A beta2

C) AA

D) AL

343. Scar formation is the result of:

A) Regeneration of parenchymal cells

B) +Deposition of fibrous connective tissue

C) Acute inflammation only

D) Apoptosis of injured cells

E) Liquefactive necrosis

344. Which cells are primarily responsible for collagen synthesis during scar formation?

A) Neutrophils

B) Macrophages

C) +Fibroblasts

D) Endothelial cells

E) Mast cells

345. The main type of collagen found in mature scars is:

A) +Type I collagen

B) Type II collagen

C) Type III collagen

D) Type IV collagen

E) Type V collagen

346. Granulation tissue is characterized by:

A) Dense collagen with few cells

B) Necrotic debris

C) +Newly formed capillaries and fibroblasts

D) Absence of blood vessels

E) Predominance of neutrophils

347. Which growth factor is most important in fibroblast migration and collagen deposition?

A) VEGF

B) +PDGF

C) IL-1

D) TNF-α

E) IFN-γ

348. Healing by primary intention occurs when:

A) There is extensive tissue loss

B) +Wound edges are closely approximated

C) Infection is present

D) Healing is delayed

E) Excessive granulation tissue forms

349. Healing by secondary intention is characterized by:

A) Minimal scarring

B) No inflammation

C) +Large wound gap and prominent scarring

D) Rapid epithelialization only

E) Absence of wound contraction

350. Which cell type plays a key role in wound contraction?

A) Neutrophils

B) Macrophages

C) Endothelial cells

D) +Myofibroblasts

E) Lymphocytes

351. The inflammatory phase of wound healing is marked mainly by:

A) Fibroblast proliferation

B) Collagen remodeling

C) +Neutrophil and macrophage infiltration

D) Scar maturation

E) Angiogenesis only

352. Excessive collagen deposition leading to a raised scar is known as:

A) +Keloid

B) Ulcer

C) Granulation tissue

D) Hematoma

E) Abscess

353. Which feature distinguishes a keloid from a hypertrophic scar?

A) Absence of collagen

B) +Growth beyond the original wound margins

C) Presence of infection

D) Poor vascularity

E) Lack of fibroblasts

354. Vitamin C deficiency impairs scar formation by reducing:

A) Angiogenesis

B) Inflammatory response

C) +Collagen synthesis

D) Epithelial regeneration

E) Fibroblast apoptosis

355. Which factor delays wound healing and scar formation?

A) Adequate blood supply

B) Young age

C) +Infection

D) Proper nutrition

E) Good oxygenation

356. Remodeling (maturation) phase of scar formation involves:

A) Replacement of type I collagen by type III

B) Increased vascularity

C) +Reorganization and strengthening of collagen fibers

D) Acute inflammation

E) Cell necrosis

357. The main function of macrophages in scar formation is:

A) Wound contraction

B) Collagen degradation only

C) +Secretion of growth factors

D) Formation of blood clots

E) Epithelial regeneration