

1. What is meant by medullary hematopoiesis?
 - A) Hematopoiesis in the spleen
 - B) Hematopoiesis in marrow
 - C) Hematopoiesis in liver
 - D) Hematopoiesis in thymus
 - E) None of the above
2. What percentage of erythrocytes is functional in peripheral blood after release from the bone marrow?
 - A) 70%
 - B) 50%
 - C) 80%
 - D) 100%
 - E) None of the above
3. The hematopoietic system consists of the:
 - A) Thymus
 - B) Bone marrow
 - C) Liver
 - D) Spleen
 - E) All of the above
4. What is the sequence of maturity for the erythrocyte?
 - A) Rubriblast, prorubricyte, metarubricyte, rubricyte, reticulocyte, erythrocyte
 - B) Prorubricyte, rubriblast, metarubricyte, reticulocyte, erythrocyte, rubricyte
 - C) Metarubricyte, rubriblast, reticulocyte, erythrocyte, prorubricyte, rubricyte
 - D) Rubricyte, metarubricyte, rubriblast, erythrocyte, reticulocyte, prorubricyte
 - E) Rubriblast, prorubricyte, rubricyte, metarubricyte, reticulocyte, erythrocyte
5. By increasing hematopoiesis, the hematopoietic system can respond to stimuli such as:
 - A) Infection
 - B) Bleeding
 - C) Hypoxia
 - D) All of the above
 - E) None of the above
6. In which immature erythroid cell are nucleoli most visible?
 - A) Basophilic normoblast
 - B) Orthochromatic normoblast
 - C) Pronormoblast
 - D) Polychromatic normoblast
 - E) None of the above

7. What is the average diameter of a normal erythrocyte?
- A) 3–5 μm
 - B) 2–4 μm
 - C) 8–10 μm
 - D) 7–8 μm
 - E) None of the above
8. The maturation of the granulocytic series is characterized by:
- A) Decrease in nuclear volume
 - B) Appearance and disappearance of primary granules
 - C) Nuclear chromatin clumping
 - D) Cytoplasmic color change from blue to pink appearance of secondary granules
 - E) All of the above
9. The sequence of maturity of the mature neutrophil is:
- A) Myeloblast, promyelocyte, myelocyte, metamyelocyte, band neutrophil, segmented neutrophil
 - B) Myeloblast, promyelocyte, metamyelocyte, myelocyte, band neutrophil, segmented neutrophil
 - C) Myeloblast, promyelocyte, band neutrophil, metamyelocyte, myelocyte, segmented neutrophil
 - D) Myeloblast, myelocyte, promyelocyte, metamyelocyte, band neutrophil, segmented neutrophil
 - E) None of the above
10. The stage in granulocyte maturation where the nucleus appears kidney shaped is evident in what cell?
- A) Promyelocyte
 - B) Band neutrophil
 - C) Metamyelocyte
 - D) Myelocyte
 - E) None of the above
11. What percentage of band neutrophils is present in the peripheral blood?
- A) 1–4%
 - B) 2–6%
 - C) 10–12%
 - D) 4–8%
 - E) None of the above

12. The first sign of neutrophilic differentiation and appearance of secondary granules is evident in what cell type?
- A) Promyelocyte
 - B) Myelocyte
 - C) Segmented neutrophil
 - D) Metamyelocyte
 - E) None of the above
13. Which cell in the granulocytic series is present in greatest percentages in the normal bone marrow?
- A) Band neutrophil
 - B) Promyelocyte
 - C) Metamyelocyte
 - D) Myelocyte
 - E) None of the above
14. What disease state can be associated with the presence of tissue neutrophils in bone marrow?
- A) Myelocytic leukemia
 - B) Erythroleukemia
 - C) Acute lymphocytic leukemia
 - D) Non-Hodgkin's lymphoma
 - E) None of the above
15. What color does the cytoplasm of eosinophils retain on Wright's stain?
- A) Bluish-purple
 - B) Reddish-orange
 - C) Reddish-pink
 - D) Purple-black
 - E) None of the above
16. What stages do both basophils and eosinophils pass through in their sequence of maturity?
- A) Promyelocyte, myelocyte, band cell, segmented cell
 - B) Myeloblast, promyelocyte, myelocyte, band cell, segmented cell
 - C) Myelocyte, metamyelocyte, band cell, segmented cell
 - D) Band cell, myelocyte, metamyelocyte, segmented cell
 - E) None of the above
17. What function do mast cells and basophils serve?
- A) Oxygen supply to tissues
 - B) Phagocytosis in parasitic infections
 - C) Histamine release in allergic reactions
 - D) Cell-mediated immunity
 - E) None of the above

18. What characteristics are helpful in the identification of monocytes?
- A) Gray-blue cytoplasm
 - B) Digestive vacuoles
 - C) Lacy, delicate chromatin and indented nucleus
 - D) “Ground-glass” appearance of cytoplasm with evenly distributed fine granules
 - E) All of the above
19. What cell does the monocyte become upon entering the tissues?
- A) Lymphocyte
 - B) Mast cell
 - C) Macrophage
 - D) Neutrophil
 - E) None of the above
20. The lymphoblast can be identified morphologically by what characteristics?
- A) Small round nucleus, basophilic cytoplasm, nucleoli
 - B) Large round nucleus, basophilic cytoplasm, no nucleoli
 - C) Small eccentric nucleus, basophilic cytoplasm, nucleoli
 - D) Large round nucleus, basophilic cytoplasm, nucleoli
 - E) None of the above
21. What percentage of lymphocytes is present in peripheral blood?
- A) 50–70%
 - B) 20–44%
 - C) 10–30%
 - D) 5–10%
 - E) None of the above
22. Where does T-cell differentiation take place?
- A) Thymus
 - B) Bone marrow
 - C) Liver
 - D) Spleen
 - E) None of the above
23. An alteration in the megakaryoblast might occur in which disease state?
- A) Iron-deficiency anemia
 - B) Chronic granulocytic leukemia
 - C) Chronic lymphocytic leukemia
 - D) Thalassemia
 - E) None of the above

24. Ultimately, megakaryocytes lead to the formation of non-nucleated, cytoplasmic fragments called:
- A) Granulocytes
 - B) Thrombocytes
 - C) Lymphocytes
 - D) Monocytes
 - E) None of the above
25. Evaluate the clinical use of interleukins:
- A) Wound healing
 - B) Activating lymphocytes
 - C) Assisting in growth of bone marrow
 - D) B and C
 - E) All are correct
26. Plasmacytes represent the end stage of what cell lineage?
- A) B lymphocytes
 - B) T lymphocytes
 - C) Prolymphocytes
 - D) Lymphoblasts
 - E) Megakaryocyte
27. Which of the following is the largest hematopoietic cell in the bone marrow?
- A) Pronormoblast
 - B) Myeloblast
 - C) Megakaryocyte
 - D) Monoblast
 - E) Plasma cell
28. Reactive lymphocytes are present in the evaluation of certain diseases such as:
- A) Infectious mononucleosis
 - B) Cancer
 - C) Bacterial infections
 - D) Tumors
 - E) Anemias

Answer Key

1. B
2. D
3. E
4. E
5. D
6. C
7. D
8. E
9. A
10. C
11. B
12. B
13. A
14. A
15. B
16. C
17. C
18. E
19. C
20. D
21. B
22. A
23. B
24. B
25. E
26. A
27. C
28. A