

1. Under appropriate stimulation the mature lymphocytes of the peripheral lymphoid organs undergo
 - A) Antigen-dependent effect on cell proliferation
 - B) Kinin or antibody production
 - C) Antibody production only
 - D) A and B
 - E) All of the above
2. Which of the following nondividing cells comprise the granulocytic maturation storage pool in the bone marrow?
 - A) Segmented neutrophils
 - B) Bands
 - C) Metamyelocytes
 - D) All of the above
 - E) None of the above
3. Which blood cell aids hematopoiesis by the direct transfer of iron to erythroid precursors?
 - A) Monocyte
 - B) Macrophage
 - C) Erythrocyte
 - D) Lymphocyte
 - E) None of the above
4. At what age do fat cells begin to increase in the bone marrow?
 - A) 10 years
 - B) 6 months
 - C) 4 years
 - D) 2 years
 - E) None of the above
5. The average life span of a circulating neutrophil is:
 - A) 6 to 10 hours
 - B) 6 to 10 days
 - C) 1 to 3 hours
 - D) 1 to 3 days
 - E) 24 hours
6. What is the main function of the bone marrow?
 - A) To provide oxygenated cells to the tissues
 - B) Self-renewal of stromal cells
 - C) To maintain a steady supply of mature hematopoietic cells to circulation
 - D) To regulate iron storage and transfer
 - E) None of the above

7. What is the site of erythropoietin production?
 - A) Spleen
 - B) Kidney
 - C) Liver
 - D) Bone marrow
 - E) None of the above
8. One-third of all circulating platelets are sequestered in which organ?
 - A) Bone marrow
 - B) Lymph nodes
 - C) Spleen
 - D) Thymus
 - E) Liver
9. The most appropriate site for a successful bone marrow aspiration in an adult patient would be:
 - A) Calvariae
 - B) Scapula
 - C) Iliac crest
 - D) Long bones
 - E) None of the above
10. Which would be the appropriate site for marrow studies in a young child?
 - A) Upper tibial bone
 - B) Lower tibial bone
 - C) Iliac crest
 - D) Sternum
 - E) None of the above
11. Why is a clotted marrow specimen unacceptable for hematologic smears?
 - A) Cells would not stain.
 - B) Fibrin threads would impede spreading.
 - C) Fluid would be discolored.
 - D) All of the above
 - E) None of the above
12. Hematogones are thought to be committed progenitor cells of what lineage?
 - A) Granulocytic
 - B) Platelets
 - C) Erythrocytic
 - D) Monocytic
 - E) Lymphoid

13. Which cells have the two unique biologic characteristics of self-renewal and multilineage differentiation?
- A) Pronormoblasts
 - B) Stem cells
 - C) Myeloblasts
 - D) Lymphoblast
 - E) Eosinophil
14. In adults, fat cells average about what percentage of the total volume in the vertebrae and flat bones of the pelvis?
- A) 20%
 - B) 80%
 - C) 50%
 - D) 10%
 - E) 90%
15. Under which magnification should bone marrow initially be examined?
- A) $\times 40$
 - B) $\times 4$
 - C) $\times 10$
 - D) $\times 100$
 - E) None of the above
16. Why is the bone biopsy the most reliable assessment of cellularity?
- A) A large amount of tissue is evaluated.
 - B) A small amount of tissue is evaluated.
 - C) It offers a more sterile procedure.
 - D) Marrow iron can be demonstrated with appropriate stain.
 - E) None of the above
17. How many nucleated cells must be classified in a bone marrow differential count?
- A) 50–100
 - B) 100–500
 - C) 500–1000
 - D) >1000
 - E) None of the above
18. The hematopoietic system consists of which of the following?
- A) Bone marrow
 - B) Lymph node
 - C) Spleen
 - D) Liver
 - E) All of the above

19. The myeloid-to-erythroid ratio represents:
- A) The ratio of granulocytic and their precursors to nucleated erythrocytes and their precursors
 - B) The ratio of myeloid to non-nucleated erythroid cells
 - C) The ratio of myeloid to eosinophilic cells
 - D) The ratio of monocytoïd to erythroid cells
 - E) None of the above
20. In a normal adult hematopoiesis is observed primarily in which location?
- A) Liver
 - B) Spleen
 - C) Yolk sac
 - D) Bone marrow
 - E) Lymph nodes
21. The normal myeloid-to-erythroid ratio in a bone marrow aspirate from a normal adult is approximately:
- A) 1:1
 - B) 2:1
 - C) 4:1
 - D) 6:1
 - E) None of the above
22. The presence of megakaryocytes clusters and promegakaryocytes in every field of a bone marrow differential is indicative of:
- A) Megakaryocytic hypoplasia
 - B) Thrombocytopenia
 - C) Megakaryocytic hyperplasia
 - D) Christmas disease
 - E) None of the above
23. An increase in erythroid cellularity without disruption of the normal myeloid-to-erythroid ratio is termed:
- A) Erythrocytic hypoplasia
 - B) Erythrocytic hyperplasia
 - C) Granulocytic hyperplasia
 - D) Granulocytic hypoplasia
 - E) None of the above
24. How is iron stored in the bone marrow?
- A) Hemosiderin
 - B) Transferrin
 - C) Ferritin
 - D) Erythropoietin
 - E) None of the above

25. On Wright's stain hemosiderin will stain as:
- A) Brownish-blue
 - B) Golden-yellow
 - C) Reddish-orange
 - D) Purple
 - E) None of the above
26. Which of the following granulocytic cells are included in the proliferating pool of the bone marrow?
- A) Myeloblasts
 - B) Promyelocytes
 - C) Myelocytes
 - D) All of the above
 - E) None of the above
27. The EDTA chelation method is used for iron studies in bone biopsy. What purpose does it serve?
- A) Binds hemosiderin
 - B) Binds magnesium
 - C) Binds calcium
 - D) Binds ferritin
 - E) None of the above
28. Marrow erythroblasts containing bright-blue iron specks when stained are called:
- A) Sideroblasts
 - B) Siderocytes
 - C) Histiocytes
 - D) Erythrocytes
 - E) None of the above
29. What bone marrow interpretation would be assessed to a complete count that showed neutrophilia with an increase in bone marrow cellularity, and increased myeloid-to-erythroid ratio?
- A) Granulocytic hypoplasia
 - B) Marrow hypoplasia
 - C) Granulocytic hyperplasia
 - D) Marrow hyperplasia
 - E) None of the above

Answer Key

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