RED BLOOD CELL ABNORMALITIES
1. ________________ is due to severe bleeding.
2. ________________ occurs when chemicals and radiation damage myeloid tissue and RBC are not produced.
3. ________________ occurs when there is a lack of iron in the body.
4. ________________ occurs when a lack of intrinsic factor leads to decreased absorption of vitamin B₁₂.
5. ________________ occurs when there is a problem producing the 4 globin chains.
6. ________________ occurs when there is a change in the sequence of amino acids in hemoglobin.

WBC
7. Neutrophils, eosinophils and basophils are _______________ (granular or agranular) leukocytes produced by ______________ tissue. (lymphoid or myeloid)
8. Which are microphages? _____________________________________________________________________
9. Which release histamine and heparin? ___________________________________________________________________
   What is the function of histamine? ___________________________________________________________________
   What is the function of heparin? ___________________________________________________________________
10. Monocytes are _______________ (granular or agranular) leukocytes produced by ______________ tissue. (lymphoid or myeloid)
     They are also called ________________ because they are large cells that can engulf organisms.
     They are also able to squeeze through tissues. This is called. ________________
     ________________ macrophages are found in specific tissues, such as skin, liver and bone.
11. Lymphocytes are _______________ (granular or agranular) leukocytes that are produced by ______________ tissue. (lymphoid or myeloid)

STEM CELLS (multipotent, omnipotent, pluripotent)
12. Embryonic stem cells, that can differentiate into all cell types, are ________________ stem cells.
    Embryonic stem cells produce hemocytoblasts that are ________________ stem cells.
    Hemocytoblasts produce myeloid and lymphoid stem cells that are ________________ stem cells that produce WBC, RBC and platelets.
13. List the 3 cells derived from lymphoid stem cells. _______________________________________
    List the 6 cells derived from myeloid stem cells. _______________________________________
CHEMICALS THAT DIFFERENTIATE CELLS (EPO, G-CSF, M-CSF, GM-CSF, multi-CSF)

14. A myeloid stem cell exposed to _____________ will form all progenitor cells.

15. A progenitor cell exposed to _____________ will ultimately form RBC.

16. A progenitor cell exposed to _____________ will produce granulocytes and monocytes.

17. A myeloblast exposed to _____________ will produce granulocytes.

18. A monoblast exposed to _____________ will produce monocytes.

HEMOSTASIS

19. ____________________ is the first step. It decreases the diameter of the blood vessel.

20. During the ________________ stage, platelets stick together and release chemicals that begin the clotting process, and some that will ultimately stop the clotting process.

21. During the ________________ phase, clotting factors are activated.

22. During ________________, fibers draw the blood clot together (syneresis).

23. During ________________, fibrinolysis occurs and the blood clot dissolves.

24. Name the chemicals released during the platelet phase. ______________________________________________________

25. What is the function of ADP? ______________________________________________________

26. Name the three pathways that are active during the coagulation phase.

27. Extrinsic means that chemicals for blood clotting are found ________________________

Intrinsic means that chemicals for blood clotting are found ________________________

28. Which pathway (extrinsic or intrinsic) is used when tissues are damaged? ______________

Which pathway (extrinsic or intrinsic) is used when blood is damaged? ______________

29. Associate the clotting factor name with the extrinsic or intrinsic pathway.

Tissue thromboplastin_________________

Plasma thromboplastin_________________

Platelet thromboplastin_________________

30. ____________________ is a bleeding disorder due to a deficiency of certain clotting factors.

31. ________________ is a coenzyme that gives rise to some clotting factors.

32. ________________ is activated by both the extrinsic and intrinsic pathways, and begins the common pathway.

33. Factor X forms the enzyme prothrombinase that converts _____________ into ____________.

34. Thrombin converts ________________, a soluble protein, into ______________, insoluble fibrous strands that trap RBC.
35. The __________________ pathway dissolves the blood clot.

36. __________ and _________________________ begin this process by activating plasminogen.

37. Plasminogen produces __________________, and enzyme that dissolves the fibrin strands of the blood clot.

BLOOD CLOT TERMINOLOGY

38. A __________________ is a blood clot that is attached to the inner wall of a blood vessel. 
   A _________________ is the formation of the blood clot.

39. An _________________ is a blood clot that detaches and travels through blood vessels.
   An _________________ occurs when a traveling blood clot blocks a blood vessel, stopping circulation at that point.

CARDIOVASCULAR PROBLEMS

40. In _________________, fatty plaque deposits build up in the middle layer of the blood vessel and project into the lumen (hollow area where blood flows).

41. In _________________, the walls of the arteries become hardened (thickened and tough) and are not able to expand easily.

42. A _________________ or heart attack occurs as a result of a coronary thrombosis (formation of a blood clot in a coronary artery in the heart).
1. hemorrhagic anemia
2. aplastic anemia
3. iron deficiency anemia
4. pernicious anemia
5. thalassemia
6. sickle cell anemia
7. granular; myeloid
8. neutrophils and eosinophils
9. basophils; inflammation: no clotting of blood at site of infection
10. agranular; myeloid; macrophages; diapedesis; fixed
11. agranular; lymphoid
12. omnipotent; pluripotent; multipotent
13. lymphoid derived - B lymphocytes, T lymphocytes, natural killer (NK)
   myeloid derived - RBC, WBC (neutrophils, basophils, eosinophils, monocytes),
   megakaryocytes (pieces of cytoplasm become platelets)
14. multi-CSF (CSF = colony stimulating factors)
15. EPO (erythropoietin)
16. GM-CSF
17. G-CSF
18. M-CSF
19. vascular spasm
20. platelet plug
21. coagulation
22. clot retraction
23. clot destruction
24. ADP, thromboxane A₂, calcium, platelet factors
25. begins platelet aggregation and secretion
26. extrinsic pathway, intrinsic pathway, common pathway
27. extrinsic - outside blood; intrinsic - in blood
28. tissue damage - extrinsic; blood damaged - intrinsic
29. tissue - extrinsic: plasma and platelet - intrinsic
30. hemophilia
31. vitamin K
32. factor X
33. prothrombin; thrombin
34. fibrinogen; fibrin
35. fibrinolytic
36. thrombin; tissue plasminogen activator (TPA)
37. plasmin
38. thrombus; thrombosis (definition from an online dictionary)
39. embolus; embolism
40. atherosclerosis
41. arteriosclerosis (see pg 713)
42. myocardial infarction