

## Specific Examination Objectives

Question Topic	Total	Average Difficulty
Anticoagulants	1	1.00
Bone Marrow	8	1.25
Cell Counts	1	1.00
Coagulation	26	2.12
Flow Cytometry	2	1.00
Leukemia	35	1.83
Lymphoma	1	3.00
Maturation	5	1.40
Myeloproliferative Disease	3	2.00
Special Stains	9	1.67
WBC Disorders	4	1.50
WBC Inclusions	1	1.00
WBC Morphology	4	1.25

  

Exam ID	Total Questions	Average Difficulty
CLS 322 Lecture #3/CLS 432 Practice #6 2008	100	1.76

*On this examination, the student will be expected to:*

1. [Level 1/Hematology/Anticoagulants/232]  
State the expected anticoagulant contents of a Vacutainer tube having a Red Stopper.
2. [Level 2/Hematology/Bone Marrow/294]  
State which differential diagnostic considerations should be included in a workup of bone marrow hypoplasia.
3. [Level 2/Hematology/Bone Marrow/298]  
Describe the morphologic appearance of 'stress' reticulocytes.
4. [Level 1/Hematology/Bone Marrow/300]  
Describe the location of erythropoiesis in normal adults.
5. [Level 1/Hematology/Bone Marrow/306]  
Discuss the mechanism of bone marrow hypoplasia in myeloproliferative disease.
6. [Level 1/Hematology/Bone Marrow/307]  
List the normal functions of the adult spleen.
7. [Level 1/Hematology/Bone Marrow/312]  
Describe the location of hematopoietic marrow in adults.
8. [Level 1/Hematology/Bone Marrow/314]  
State the cells normally seen only in the bone marrow.
9. [Level 1/Hematology/Bone Marrow/328]  
Define bone marrow cellularity and state the normal cell to fat ratio.
10. [Level 3/Hematology/Coagulation/510]  
Define Fitzgerald Factor.
11. [Level 2/Hematology/Coagulation/523]  
Characterize the purpose of the international sensitivity index (ISI).

12. [Level 3/Hematology/Coagulation/611]  
State the effects of afibrinogenemia on the Thrombin Time, Prothrombin Time (PT), and Activated Partial Thromboplastin Time (APTT) laboratory tests for coagulation disorders.
13. [Level 2/Hematology/Coagulation/708]  
Describe four characteristics of Thrombin.
14. [Level 2/Hematology/Coagulation/709]  
Given appropriate laboratory data, evaluate the results of the platelet count, clot retraction test, and Factor VIII antigen test in a patient with Classic Von Willebrand's Disease.
15. [Level 2/Hematology/Coagulation/713]  
Identify the site of production of each of the Plasma coagulation factors.
16. [Level 2/Hematology/Coagulation/716]  
Describe the effects of Aspirin on platelets.
17. [Level 2/Hematology/Coagulation/722]  
State which of the coagulation factors are dependent upon Vitamin K for their production.
18. [Level 2/Hematology/Coagulation/723]  
Describe the purpose of Barium Sulfate absorbed plasma.
19. [Level 2/Hematology/Coagulation/737]  
Identify the plasma coagulation factors measured by the Prothrombin Time (PT).
20. [Level 2/Hematology/Coagulation/738]  
Evaluate the expected PT and APTT results in a patient with Factor VIII deficiency.
21. [Level 2/Hematology/Coagulation/743]  
State four characteristics of plasma coagulation Factor II.
22. [Level 3/Hematology/Coagulation/750]  
Identify the laboratory test of choice in the evaluation of a suspected case of abnormal platelet function.
23. [Level 2/Hematology/Coagulation/766]  
Define plasminogen.
24. [Level 2/Hematology/Coagulation/776]  
Define 'sex-linked genetic disorder'.
25. [Level 2/Hematology/Coagulation/777]  
Explain why the PT and APTT will not detect a deficiency of Platelet factors.
26. [Level 1/Hematology/Coagulation/786]  
Describe the importance of Factor XIII.
27. [Level 2/Hematology/Coagulation/790]  
Identify the test of choice in detecting abnormalities of the Extrinsic clotting pathway.
28. [Level 2/Hematology/Coagulation/792]  
Explain why Vitamin K is necessary for normal coagulation.
29. [Level 2/Hematology/Coagulation/794]  
Describe the function of ADP with regard to platelet function.
30. [Level 2/Hematology/Coagulation/796]  
Describe which of the coagulation factors are mainly responsible for the effectiveness of the coumarin anticoagulants.
31. [Level 2/Hematology/Coagulation/801]  
State the principle of the activated partial Thromboplastin Time (APTT).

32. [Level 1/Hematology/Coagulation/802]  
Discuss the importance of vasoconstriction in coagulation.
33. [Level 2/Hematology/Coagulation/805]  
Diagram the EXTRINSIC pathway of coagulation.
34. [Level 3/Hematology/Coagulation/809]  
Given appropriate laboratory data, identify the probable clotting factor deficiency in a patient having a suspected coagulation disorder.
35. [Level 3/Hematology/Coagulation/811]  
Given appropriate laboratory data, identify the probable clotting factor deficiency in a patient having a suspected coagulation disorder.
36. [Level 1/Hematology/Flow Cytometry/854]  
Explain the effects on the detected fluorescent signal in DNA testing using flow cytometry, as the DNA content of the cell increases.
37. [Level 1/Hematology/Flow Cytometry/860]  
Explain how an indirect immunofluorescence assay might be performed using monoclonal antibodies and a flow cytometer.
38. [Level 1/Hematology/Leukemia/1451]  
State the coagulation abnormality frequently seen in FAB M3 acute leukemia.
39. [Level 1/Hematology/Leukemia/1457]  
Evaluate how the Leukocyte Alkaline Phosphatase stain may be used in the differentiation of leukemia from a 'leukemoid reaction'.
40. [Level 1/Hematology/Leukemia/1460]  
State the significance of ringed sideroblasts seen on a bone marrow examination.
41. [Level 1/Hematology/Leukemia/1466]  
Identify the leukemia accompanied by an unusually high incidence of DIC (disseminated Intravascular Coagulation).
42. [Level 1/Hematology/Leukemia/1475]  
Explain and give an example of each of the Types identified by the FAB system of leukemia classification.
43. [Level 1/Hematology/Leukemia/1476]  
State the predominant lymphocyte type in a patient with Chronic Lymphocytic Leukemia.
44. [Level 1/Hematology/Leukemia/1477]  
State the significance of the Reed-Sternberg cell.
45. [Level 1/Hematology/Leukemia/1483]  
Identify the criteria which is used to distinguish between the various types of leukemia in the FAB classification scheme.
46. [Level 1/Hematology/Leukemia/1485]  
State the importance of the Ph1 (Philadelphia) chromosome.
47. [Level 2/Hematology/Leukemia/1496]  
Identify the FAB (French-American-British) classification of acute lymphoblastic leukemia which represents a heterogeneous population and is morphologically similar to AML (acute myeloblastic leukemia), type M1
48. [Level 2/Hematology/Leukemia/1500]  
Identify the cell type in which Auer Rods are seen.

49. [Level 1/Hematology/Leukemia/1510]  
State the composition of and the significance of Auer Rods.
50. [Level 2/Hematology/Leukemia/1516]  
Identify the predominant cell type seen in FAB M7 acute leukemia.
51. [Level 2/Hematology/Leukemia/1523]  
State the appropriate laboratory studies that would be necessary in the workup of an acute leukemia.
52. [Level 3/Hematology/Leukemia/1571]  
State the major laboratory findings in a patient having CML (chronic myelocytic leukemia).
53. [Level 2/Hematology/Leukemia/1600]  
Evaluate the possible significance of many smudge cells and an absolute lymphocytosis in an elderly patient.
54. [Level 2/Hematology/Leukemia/1604]  
State the usual FAB morphological type of a pediatric patient with Precursor B-cell acute lymphoblastic leukemia.
55. [Level 3/Hematology/Leukemia/1606]  
State the clinical and laboratory findings expected in a patient with FAB M3 acute leukemia.
56. [Level 1/Hematology/Leukemia/1627]  
State the FAB classification of Burkitt-type acute lymphoblastic leukemia.
57. [Level 1/Hematology/Leukemia/1631]  
State the predominant cell types present in FAB M6 acute leukemia.
58. [Level 2/Hematology/Leukemia/1634]  
State why it might be difficult to distinguish acute lymphocytic leukemia from acute myelocytic leukemia on a stained smear.
59. [Level 3/Hematology/Leukemia/1636]  
Identify the expected cytochemical staining results in a patient with Acute Myelocytic Leukemia.
60. [Level 1/Hematology/Leukemia/1638]  
Identify the age group most often associated with FAB M1 leukemia.
61. [Level 3/Hematology/Leukemia/1639]  
State the laboratory findings and expected cytochemical staining results in a patient with FAB M2 leukemia.
62. [Level 3/Hematology/Leukemia/1640]  
Given appropriate laboratory data, state the likely diagnosis for an acute leukemia.
63. [Level 1/Hematology/Leukemia/1645]  
Identify the Philadelphia (Ph1) chromosome.
64. [Level 1/Hematology/Leukemia/1649]  
State the expected laboratory result for the platelet count in patients having acute leukemia, and explain why that result is most frequently seen.
65. [Level 3/Hematology/Leukemia/1655]  
Describe and Evaluate the special cytochemical staining results seen in a person with FAB M4 acute leukemia.
66. [Level 3/Hematology/Leukemia/1656]  
Evaluate the causes of excessive bleeding in patients with AProL (Acute Promyelocytic Leukemia).
67. [Level 3/Hematology/Leukemia/1657]  
Evaluate the clinical and laboratory results seen in a patient with acute leukemia type L1.

68. [Level 2/Hematology/Leukemia/1661]  
State the cell types involved in FAB M4 and M5 acute leukemia.
69. [Level 1/Hematology/Leukemia/1673]  
State the effects that Granulocytic leukemia would have on the M:E ratio.
70. [Level 3/Hematology/Leukemia/1675]  
Evaluate the clinical, laboratory and special staining results expected in a patient with Acute Myelocytic Leukemia.
71. [Level 3/Hematology/Leukemia/1677]  
Evaluate the clinical usefulness of the TRAP (tartrate-resistant acid phosphatase) stain.
72. [Level 2/Hematology/Leukemia/1678]  
Evaluate the clinical and laboratory data expected in a patient with Erythroleukemia.
73. [Level 3/Hematology/Lymphoma/1753]  
State the cell type which is diagnostic of Hodgkin's lymphoma.
74. [Level 2/Hematology/Maturation/1789]  
State the differentiating characteristics between a myeloblast and a promyelocyte.
75. [Level 1/Hematology/Maturation/1795]  
State the differentiating characteristics of a promyelocyte.
76. [Level 2/Hematology/Maturation/1796]  
Identify the cell type whose function is entirely within the confines of the vascular system.
77. [Level 1/Hematology/Maturation/1801]  
State which type of white blood cell is thought to be a precursor of a tissue mast cell.
78. [Level 1/Hematology/Maturation/1803]  
State the stage of maturation at which specific granulation first starts to appear.
79. [Level 2/Hematology/Myeloproliferative Disease/2000]  
Evaluate and contrast urinary erythropoietin levels in patients with polycythemia vera and with secondary polycythemia.
80. [Level 2/Hematology/Myeloproliferative Disease/2004]  
Define and state the characteristics of leukoerythroblastosis.
81. [Level 2/Hematology/Myeloproliferative Disease/2037]  
State the type of condition for which a patient with polycythemia vera who is treated by phlebotomy is most at risk.
82. [Level 2/Hematology/Special Stains/2652]  
Identify the probable cell type when both the Sudan Black B and esterase stains are positive in a case of suspected acute leukemia.
83. [Level 2/Hematology/Special Stains/2660]  
Explain which cytochemical stain might be used to differentiate CML from a neutrophilic leukemoid reaction.
84. [Level 2/Hematology/Special Stains/2692]  
Evaluate the expected results of a PAS stain in a patient with FAB M6 acute leukemia.
85. [Level 1/Hematology/Special Stains/2714]  
Explain the effects of a change of buffer pH when doing a Wright Stain of peripheral blood.
86. [Level 1/Hematology/Special Stains/2717]  
Evaluate expected staining results for the PAS stain in a patient with leukemia.

87. [Level 2/Hematology/Special Stains/2740]  
Explain whether Auer Rods can be stained with the Leukocyte Alkaline Phosphatase stain.
88. [Level 1/Hematology/Special Stains/2741]  
Identify the cellular component stained by Sudan Black B.
89. [Level 2/Hematology/Special Stains/2743]  
State the usefulness of the peroxidase stain in differentiating acute lymphocytic leukemia from acute granulocytic leukemia .
90. [Level 2/Hematology/Special Stains/2747]  
Identify the cell type which stains positive with the special stain alpha-naphthyl acetate esterase.
91. [Level 1/Hematology/WBC Disorders/2773]  
State the clinical features of Multiple Myeloma.
92. [Level 1/Hematology/WBC Disorders/2776]  
Define 'myeloproliferative disorder'.
93. [Level 2/Hematology/WBC Disorders/2781]  
Define 'di Guglielmo's Syndrome'.
94. [Level 2/Hematology/WBC Disorders/2785]  
Explain the difference between 'relative' and 'absolute' differential results.
95. [Level 1/Hematology/WBC Inclusions/2786]  
Define 'Dohle body'.
96. [Level 1/Hematology/WBC Morphology/2790]  
State the significance of 'drumstick chromatin'.
97. [Level 2/Hematology/WBC Morphology/2793]  
Explain what bone marrow finding would favor a diagnosis of Multiple Myeloma.
98. [Level 1/Hematology/WBC Morphology/2794]  
Define 'pince-nez' cells.
99. [Level 1/Hematology/WBC Morphology/2801]  
Explain what morphological characteristics would allow one to differentiate between reactive lymphocytes and malignant lymphoma cells.
100. [Level 1/Immunology/Cell Counts/2991]  
State why laser light is the preferred choice for flow cytometry.

**Levels given in brackets at the beginning of the question objective indicate the level of difficulty for the actual question on this examination, NOT the level of difficulty for the stated objective. Levels of difficulty were developed using Bloom, et.al. Taxonomy of Educational Objectives. Also shown in the brackets are the Category of the question, the Topic of the question, and the number of the question in the database.**

Explanation of Categories in the Cognitive Domain: (with Outcome-Illustrating Verbs)

Level 1: Recall

Knowledge of terminology; specific facts; ways and means of dealing with specifics (conventions, trends and sequences, classifications and categories, criteria, methodology); universals and abstractions in a field (principles and generalizations, theories and structures). Knowledge is (here) defined as the remembering (recalling) of appropriate, previously learned information.

\* defines; describes; enumerates; identifies; labels; lists; matches; names; reads; records; reproduces; selects; states; views.

Level 2: Comprehension

Grasping (understanding) the meaning of informational materials.

\* classifies; cites; converts; describes; discusses; estimates; explains; generalizes; gives examples; makes sense out of; paraphrases; restates (in own words); summarizes; traces; understands.

Level 3: Application

The use of previously learned information in new and concrete situations to solve problems that have single or best answers.

\* acts; administers; articulates; assesses; charts; collects; computes; constructs; contributes; controls; determines; develops; discovers; establishes; extends; implements; includes; informs; instructs; operationalizes; participates; predicts; prepares; preserves; produces; projects; provides; relates; reports; shows; solves; teaches; transfers; uses; utilizes.

Taxonomy of educational objectives : the classification of educational goals ; / by a committee of college and university examiners ; Benjamin S. Bloom, editor [and others] IMPRINT New York : D. McKay Co., Inc., c1956-1964 (1971-72 printing) DESCRIPT. 2 v. in 1 : ill. ; 22 cm. NOTE Vol.2 by D.R. Krathwohl and others.

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