

Specific Examination Objectives

Question Topic	<i>Total</i>	<i>Average Difficulty</i>
Anemia	29	1.59
Bone Marrow	4	1.50
Cell Counts	1	1.00
Coagulation	3	1.67
Hemoglobinopathies	7	2.14
Hemolytic Anemia	11	1.36
Leukemia	18	1.67
Macrocytic Anemia	1	3.00
Maturation	7	1.29
Megaloblastic Anemia	1	2.00
Polycythemia	1	1.00
RBC Morphology	4	1.50
Reticulocytes	1	2.00
Special Stains	4	1.75
Thalassemia	1	2.00
WBC Disorders	3	1.33
WBC Morphology	4	1.25

<i>Exam ID</i>	<i>Total Questions</i>	<i>Average Difficulty</i>
CLS 322 Final Exam/CLS 432 Exam #2 2008	100	1.59

On this examination, the student will be expected to:

1. [Level 1/Hematology/Anemia/7]
Describe the red cell morphology most often seen in aplastic anemia.
2. [Level 1/Hematology/Anemia/10]
Discuss the etiology of the anemia of chronic disease.
3. [Level 3/Hematology/Anemia/15]
Calculate a corrected reticulocyte count.
4. [Level 1/Hematology/Anemia/24]
State the expected morphologic findings in a patient with lead (Pb) poisoning.
5. [Level 2/Hematology/Anemia/34]
Evaluate the usefulness of the Direct Antiglobulin Test (DAT) when attempting to determine the cause of a hemolytic anemia.
6. [Level 2/Hematology/Anemia/57]
Describe the laboratory findings and clinical correlations of anemias caused by endocrine, liver, and kidney diseases.
7. [Level 2/Hematology/Anemia/68]
Describe the clinical and laboratory findings most often associated with the aplastic crises seen in Sickle Cell Anemia.
8. [Level 1/Hematology/Anemia/79]
Evaluate the usefulness of the appearance of a Cabot ring on a Wright stained smear of peripheral blood.

9. [Level 2/Hematology/Anemia/83]
Define megaloblastic, asynchronous maturation, and discuss conditions in which this is seen.
10. [Level 2/Hematology/Anemia/89]
Compare the expected results of a reticulocyte count done on a person with Pernicious Anemia with that done on an individual with sickle cell disease (Hgb SS).
11. [Level 1/Hematology/Anemia/92]
Discuss the morphological appearance of erythrocytes as seen in Beta Thalassemia Major and Minor.
12. [Level 1/Hematology/Anemia/100]
State the specific amino acid substitution found in Hemoglobin S disease.
13. [Level 1/Hematology/Anemia/104]
Explain the difference between a relative, and an absolute, anemia.
14. [Level 1/Hematology/Anemia/107]
Evaluate the clinical usefulness of the Prussian Blue stain with respect to the diagnosis of anemia.
15. [Level 1/Hematology/Anemia/117]
Discuss the expected Wright stain morphologic findings in a patient with Hemoglobin C disease (Hgb CC).
16. [Level 2/Hematology/Anemia/120]
Describe the etiology of the bone marrow hypocellularity often seen with severe kidney disease.
17. [Level 2/Hematology/Anemia/122]
Given laboratory data, calculate the MCV for a patient.
18. [Level 1/Hematology/Anemia/127]
Define thalassemia.
19. [Level 1/Hematology/Anemia/128]
Correlate the Indices with expected red blood cell morphology.
20. [Level 2/Hematology/Anemia/129]
Describe the clinical and laboratory findings associated with a patient having liver disease.
21. [Level 2/Hematology/Anemia/131]
Evaluate why a person with polycythemia vera, who is being treated with therapeutic phlebotomy, could be in danger of developing iron deficiency anemia.
22. [Level 2/Hematology/Anemia/136]
Evaluate laboratory findings associated with Beta Thalassemia Minor.
23. [Level 1/Hematology/Anemia/139]
Identify the most probable causes of anemia in a patient with chronic renal failure.
24. [Level 2/Hematology/Anemia/143]
Evaluate sources of error in performing hematocrit determinations, with regard to their effects on RBC indices.
25. [Level 2/Hematology/Anemia/158]
Contrast the etiology of Paroxysmal Nocturnal Hemoglobinuria and Paroxysmal Cold Hemoglobinuria.
26. [Level 1/Hematology/Anemia/164]
Describe the etiology of the hemolysis found in paroxysmal nocturnal hemoglobinuria (PNH).
27. [Level 2/Hematology/Anemia/165]
State the expected laboratory findings in a patient with iron deficiency anemia, with respect to the Red Cell Indices and the Complete Blood Count (CBC).

28. [Level 2/Hematology/Anemia/173]
Define polychromasia, and discuss its significance.
29. [Level 2/Hematology/Anemia/184]
Differentiate between iron deficiency anemia and beta thalassemia minor, utilizing expected laboratory findings.
30. [Level 2/Hematology/Bone Marrow/294]
State which differential diagnostic considerations should be included in a workup of bone marrow hypoplasia.
31. [Level 2/Hematology/Bone Marrow/298]
Describe the morphologic appearance of 'stress' reticulocytes.
32. [Level 1/Hematology/Bone Marrow/306]
Discuss the mechanism of bone marrow hypoplasia in myeloproliferative disease.
33. [Level 1/Hematology/Bone Marrow/314]
State the cells normally seen only in the bone marrow.
34. [Level 2/Hematology/Coagulation/738]
Evaluate the expected PT and APTT results in a patient with Factor VIII deficiency.
35. [Level 2/Hematology/Coagulation/792]
Explain why Vitamin K is necessary for normal coagulation.
36. [Level 1/Hematology/Coagulation/802]
Discuss the importance of vasoconstriction in coagulation.
37. [Level 3/Hematology/Hemoglobinopathies/984]
Explain why a hemoglobin electrophoresis on a newborn whose mother carries a sickle trait should be deferred until the infant is at least 6 months of age.
38. [Level 1/Hematology/Hemoglobinopathies/986]
State the morphologic aberration most frequently found in Hemoglobin C disease.
39. [Level 2/Hematology/Hemoglobinopathies/988]
Explain how the presence of Hemoglobin S in a patient may be confirmed.
40. [Level 1/Hematology/Hemoglobinopathies/990]
State the principle of the Sickledex screening test for Hgb S.
41. [Level 3/Hematology/Hemoglobinopathies/994]
Explain how the differentiation is made between iron deficiency anemia, and thalassemia minor.
42. [Level 3/Hematology/Hemoglobinopathies/999]
Describe the peripheral blood characteristics of a patient having Hemoglobin SC disease.
43. [Level 2/Hematology/Hemoglobinopathies/1011]
Evaluate the process by which iron deficiency anemia may be differentiated from thalassemia.
44. [Level 1/Hematology/Hemolytic Anemia/1029]
State the major antibody found in paroxysmal cold hemoglobinuria (PCH).
45. [Level 1/Hematology/Hemolytic Anemia/1030]
Define methemoglobin.
46. [Level 1/Hematology/Hemolytic Anemia/1033]
State the slowest moving hemoglobin on electrophoresis at pH 8.6.
47. [Level 1/Hematology/Hemolytic Anemia/1037]
State the chain composition of Hgb F.

48. [Level 2/Hematology/Hemolytic Anemia/1038]
Describe the type of hemolysis typically found in Hereditary Spherocytosis.
49. [Level 2/Hematology/Hemolytic Anemia/1093]
Evaluate why large numbers of target cells (>60%) might be seen in a patient having a known sickle cell trait.
50. [Level 2/Hematology/Hemolytic Anemia/1097]
Evaluate the efficacy of a transfusion of normal packed red cells into a patient having an extrinsic hemolytic episode.
51. [Level 1/Hematology/Hemolytic Anemia/1135]
State the percentage of Hemoglobin F in the blood of normal adults.
52. [Level 1/Hematology/Hemolytic Anemia/1151]
State the morphologic characteristic most characteristic of hemolysis.
53. [Level 1/Hematology/Hemolytic Anemia/1163]
Define Bart's hemoglobin.
54. [Level 2/Hematology/Hemolytic Anemia/1200]
Discuss the participation of haptoglobin in the process of hemolysis.
55. [Level 1/Hematology/Leukemia/1467]
Define leukemic hiatus.
56. [Level 1/Hematology/Leukemia/1472]
Identify the major acute leukemia found in children.
57. [Level 1/Hematology/Leukemia/1475]
Explain and give an example of each of the Types identified by the FAB system of leukemia classification.
58. [Level 1/Hematology/Leukemia/1477]
State the significance of the Reed-Sternberg cell.
59. [Level 1/Hematology/Leukemia/1485]
State the importance of the Ph1 (Philadelphia) chromosome.
60. [Level 2/Hematology/Leukemia/1500]
Identify the cell type in which Auer Rods are seen.
61. [Level 2/Hematology/Leukemia/1523]
State the appropriate laboratory studies that would be necessary in the workup of an acute leukemia.
62. [Level 2/Hematology/Leukemia/1604]
State the usual FAB morphological type of a pediatric patient with Precursor B-cell acute lymphoblastic leukemia.
63. [Level 3/Hematology/Leukemia/1606]
State the clinical and laboratory findings expected in a patient with FAB M3 acute leukemia.
64. [Level 1/Hematology/Leukemia/1627]
State the FAB classification of Burkitt-type acute lymphoblastic leukemia.
65. [Level 1/Hematology/Leukemia/1631]
State the predominant cell types present in FAB M6 acute leukemia.
66. [Level 3/Hematology/Leukemia/1636]
Identify the expected cytochemical staining results in a patient with Acute Myelocytic Leukemia.

67. [Level 1/Hematology/Leukemia/1638]
Identify the age group most often associated with FAB M1 leukemia.
68. [Level 1/Hematology/Leukemia/1645]
Identify the Philadelphia (Ph1) chromosome.
69. [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.
70. [Level 3/Hematology/Leukemia/1655]
Describe and Evaluate the special cytochemical staining results seen in a person with FAB M4 acute leukemia.
71. [Level 3/Hematology/Leukemia/1657]
Evaluate the clinical and laboratory results seen in a patient with acute leukemia type L1.
72. [Level 2/Hematology/Leukemia/1678]
Evaluate the clinical and laboratory data expected in a patient with Erythroleukemia.
73. [Level 3/Hematology/Macrocytic Anemia/1779]
Correlate clinical and laboratory data in Folic Acid and/or Vitamin B12 deficiency .
74. [Level 1/Hematology/Maturation/1794]
State the defining characteristic of a Promyelocyte.
75. [Level 1/Hematology/Maturation/1801]
State which type of white blood cell is thought to be a precursor of a tissue mast cell.
76. [Level 1/Hematology/Maturation/1803]
State the stage of maturation at which specific granulation first starts to appear.
77. [Level 2/Hematology/Maturation/1807]
State the defining characteristic of a myelocyte.
78. [Level 1/Hematology/Maturation/1811]
Describe how impaired synthesis of DNA would lead to megaloblastic, asynchronous development within the red cell.
79. [Level 1/Hematology/Maturation/1812]
Identify the cell in the peripheral blood that is the precursor to the fixed tissue histiocyte.
80. [Level 2/Hematology/Maturation/1817]
Describe the morphologic characteristics of a Rubricyte.
81. [Level 2/Hematology/Megaloblastic Anemia/1835]
Correlate clinical and laboratory hematologic findings of a patient with alcoholism.
82. [Level 1/Hematology/Polycythemia/2249]
State the effects that a patient's erythropoietin-concentrating primary tumor might have on the patients Hemoglobin, Hematocrit, and RBC counts.
83. [Level 1/Hematology/RBC Morphology/2301]
Define and state the significance of rouleaux.
84. [Level 1/Hematology/RBC Morphology/2302]
Explain the purpose of an RDW (red cell distribution width).
85. [Level 2/Hematology/RBC Morphology/2304]
Discuss mechanisms by which schistocytes may appear on the peripheral blood smear.

86. [Level 2/Hematology/RBC Morphology/2308]
Contrast the expectation of visualizing 'sickle cells' in a person having Hgb SS disease, versus a person with sickle cell trait.
87. [Level 2/Hematology/Reticulocytes/2526]
Given laboratory data, calculate the reticulocyte count.
88. [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.
89. [Level 1/Hematology/Special Stains/2717]
Evaluate expected staining results for the PAS stain in a patient with leukemia.
90. [Level 2/Hematology/Special Stains/2740]
Explain whether Auer Rods can be stained with the Leukocyte Alkaline Phosphatase stain.
91. [Level 2/Hematology/Special Stains/2747]
Identify the cell type which stains positive with the special stain alpha-naphthyl acetate esterase.
92. [Level 2/Hematology/Thalassemia/2772]
State the hemoglobins produced in the major types of thalassemia, and give their approximate percentages in peripheral blood.
93. [Level 1/Hematology/WBC Disorders/2774]
State the laboratory findings and symptoms often associated with leukemoid reactions.
94. [Level 2/Hematology/WBC Disorders/2778]
State which of the monoclonal gammopathies is of B-cell origin?
95. [Level 1/Hematology/WBC Disorders/2780]
Describe the peripheral blood observations often seen in patients with Chediak-Higashi syndrome.
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/2800]
Evaluate laboratory differential results seen in a patient with Pelger Huet anomaly.
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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