ASCP BOARD OF CERTIFICATION

Scientist in Blood Banking - BB(ASCP) and BB(ASCP^i)
Specialist in Blood Banking - SBB(ASCP) and SBB(ASCP^i)
Examination Content Guideline

Examination Format

The American Society for Clinical Pathology Board of Certification (ASCP BOC) BB and SBB certification examinations are composed of 100 questions given in a 2-hour 30-minute time frame. All examination questions are multiple-choice with one best answer. The examinations are administered using the format of computer adaptive testing (CAT). More information is available on the ASCP BOC website.

The examination questions may be both theoretical and/or procedural. Theoretical questions measure skills necessary to apply knowledge, calculate results, and correlate patient results to disease states. Procedural questions measure skills necessary to perform laboratory techniques and follow quality assurance protocols.

Examination Content Areas

The examination questions encompass the following content areas within blood banking. Each of these content areas comprises a specific percentage of the overall 100-question examination.

Content Area	Description	Examination Percentage
Blood Products	Donors, processing, storage, types of blood components, blood component quality control	**BB: 15 – 20%** **SBB: 10 – 15%**
Blood Group Systems	Genetics, biochemistry/antigens, role of blood groups in transfusion	**BB: 15 – 20%** **SBB: 15 – 20%**
Immunology and Physiology	Immune response, immunoglobulins, antigen-antibody interactions, complement, physiology of blood, hemostasis and coagulation, HDFN, cytopenias, transplantation	**BB: 10 – 20%** **SBB: 15 – 25%**
Serologic and Molecular Testing	Routine tests, reagents, application of special tests and reagents, quality assurance	**BB: 20 – 25%** **SBB: 20 – 25%**
Transfusion Practice	Indications for transfusion, component therapy, adverse effects of transfusion, apheresis and extracorporeal circulation, blood administration and patient blood management	**BB: 15 – 20%** **SBB: 15 – 20%**
Laboratory Operations	Quality assessment/troubleshooting, safety, laboratory mathematics, instrumentation, laboratory administration **(SBB ONLY)**	**BB: 5 – 10%** **SBB: 10 – 15%**

For a more detailed overview of the examinations, refer to the content outline starting on page 2.

Examination Content Outline

- Regulatory questions on the examination are based on U.S. sources (e.g., AABB, FDA, CLIA, etc.).
- The examples provided in this content outline (as indicated by e.g.,) are not limited to those listed.
- The laboratory results and reference ranges on the examination will be provided in both conventional and SI units.

Note about blood banking donor eligibility examination questions:
The blood banking donor eligibility examination questions are based on current regulations as of June 2023.

I. Blood Products

BB: 15 – 20% of total examination
SBB: 10 – 15% of total examination

A. Donors
1. Qualification
2. Collection methods
3. Adverse reactions
4. Special donations (e.g., autologous)

B. Processing
1. FDA, AABB requirements
2. Testing
3. Labeling

C. Storage
1. Anticoagulants/additives
2. Temperature requirements
3. Transportation
4. Properties of stored products
5. Expiration

D. Blood Components
1. Red blood cells
2. Cryoprecipitated AHF
3. Platelets
4. Plasma
5. Granulocytes
6. Leukocyte-reduced components
7. Frozen/deglycerolized red blood cells
8. Apheresis products
9. Fractionation products
10. Whole blood
11. Washed red blood cells
12. Rejuvenated red blood cells
13. Irradiated components
14. Hematopoietic progenitors

E. Blood Component Quality Control

II. Blood Group Systems

BB and SBB: 15% – 20% of total examination

A. Genetics
1. Basic
2. Molecular
3. Inheritance of blood groups

B. Biochemistry/Antigens
1. ABO
2. Lewis
3. Rh
4. MNS
5. P1PK/Globoside(P)
6. Ii
7. Kell
8. Kidd
9. Duffy
10. Lutheran
11. Other blood group systems
12. Antigens of high prevalence
13. Antigens of low prevalence
14. HLA
15. Platelet-specific
16. Granulocyte-specific

C. Role of Blood Groups in Transfusion
1. Immunogenicity
2. Antigen prevalence

III. Immunology and Physiology

BB: 10 – 20% of total examination

SBB: 15 – 25% of total examination

A. Immunology

1. Immune response
   a. Primary and secondary response
   b. B and T cells, macrophages
   c. Genetics
2. Immunoglobulins
   a. Classes and subclasses
   b. Structure
   c. Biologic and physical properties
3. Antigen-antibody interactions
   a. Principles
   b. Testing
      1) Principles
      2) Methods
4. Complement
   a. Classical and alternative pathway mechanisms
   b. Biologic properties

B. Physiology and Pathophysiology

1. Physiology of blood
   a. Circulation and blood volume
   b. Composition and function of blood
      1) Normal function
      2) Abnormal physiology
   c. Cell survival
   d. Cell metabolism
2. Hemostasis and coagulation
   a. Coagulation factors and disorders
      1) Coagulation factor assay result interpretation
   b. Platelet functions and disorders
3. Hemolytic disease of the fetus and newborn
   a. Pathophysiology
   b. Detection
   c. Treatment
   d. Prevention
4. Cytopenias
   a. Anemia (immune and nonimmune)
      1) Pathophysiology
      2) Detection
      3) Treatment
   b. Thrombocytopenia (immune and nonimmune)
      1) Pathophysiology
      2) Detection
      3) Treatment
   c. Neutropenia
      1) Pathophysiology
      2) Detection
      3) Treatment
5. Transplantation
   a. Solid organ
   b. Hematopoietic progenitor cell (HPC)

IV. Serologic and Molecular Testing

BB and SBB: 20 – 25% of total examination

A. Routine Tests

1. Blood grouping tests
2. Compatibility tests
   a. Antibody detection
   b. Crossmatch
3. Antibody identification/clinical significance
4. Direct antiglobulin testing

B. Reagents

1. Antiglobulin sera
2. Blood grouping sera
3. Reagent red blood cells

C. Special Tests and Reagents

1. Enzymes
2. Enhancement media
3. Lectins
4. Adsorptions
5. Elutions
6. Titrations
7. Cell separations
8. ELISA
9. Molecular techniques
10. Neutralization/inhibition
11. Use of thiol reagents
12. Immunofluorescence
13. Solid phase

14. Column agglutination test
15. Chloroquine diphosphate
16. EDTA-glycine acid

D. Quality Assurance

1. Blood samples
2. Reagents
3. Test procedures

V. Transfusion Practice

BB and SBB: 15 – 20% of total examination

A. Indications for Transfusion
B. Component Therapy
C. Adverse Effects of Transfusion
1. Immunologic reactions
2. Nonimmunologic reactions
3. Transfusion-transmitted diseases

D. Apheresis and Extracorporeal Circulation
E. Blood Administration and Patient Blood Management

VI. Laboratory Operations

BB: 5 – 10% of total examination
SBB: 10 – 15% of total examination

A. Quality Assessment/Troubleshooting

1. Preanalytical, analytical, postanalytical
2. Quality control
3. Regulation (e.g., proficiency testing, competency assessment, accreditation standards)

B. Safety

1. Safety programs and practices
   a. Prevention of infection with bloodborne pathogens
   b. Use of personal protective equipment (PPE)
   c. Safe work practices
   d. Safety data sheets (SDS) for chemicals and reagents
2. Emergency procedures (e.g., needlesticks, splashes to mucous membranes, fire)

C. Laboratory Mathematics

D. Instrumentation

1. Microscope
2. Centrifuge
3. Cell washer
4. Irradiator
5. Automated analyzer

E. Laboratory Administration (SBB ONLY)

1. Financial
   a. Budgets
   b. Capital equipment acquisition
   c. Cost analysis and reimbursement
   d. Purchasing and inventory
2. Operations
   a. Customer service
   b. Facility management (e.g., laboratory design, utilities)
   c. Information technology
   d. Data management (e.g., research, outcomes)
   e. Test verification/validation
3. Personnel
   a. Staffing and productivity
   b. Performance standards (e.g., training, competency assessment)
   c. Counseling, disciplinary action, and conflict resolution
   d. Education and training
4. Quality management
   a. Continuous quality improvement
   b. Individualized Quality Control Plan (IQCP)
   c. Risk management/medical-legal issues
5. Tissue management storage and distribution

END OF CONTENT GUIDELINE