ASCP BOARD OF CERTIFICATION

# TECHNOLOGIST AND INTERNATIONAL TECHNOLOGIST IN BLOOD BANKING, BB(ASCP) AND BB(ASCP$^i$)
# SPECIALIST AND INTERNATIONAL SPECIALIST IN BLOOD BANKING, SBB(ASCP) AND SBB(ASCP$^i$)

## EXAMINATION CONTENT GUIDELINE

### EXAMINATION MODEL

The BB(ASCP), BB(ASCP$^i$), SBB(ASCP), and SBB(ASCP$^i$) certification examinations are composed of 100 examination questions given in a 2 hour 30 minute time frame. All examination questions are multiple-choice with one best answer. The certification examinations are administered using the format of computer adaptive testing (CAT).

With CAT, when a person answers a question correctly, the next test question has a slightly higher level of difficulty. The difficulty level of the questions presented to the examinee continues to increase until a question is answered incorrectly. Then a slightly easier question is presented. In this way, the test is tailored to the individual's ability level.

Each question in the test bank is calibrated for level of difficulty and is assigned a content area that matches with the subtest area of the content outline for a particular examination. The weight (value) given to each question is determined by the level of difficulty. Therefore, the examinee must answer enough difficult questions to achieve a score above the pass point in order to successfully pass the certification examination.

### EXAMINATION SUBTESTS

The BB(ASCP), BB(ASCP$^i$), SBB(ASCP), and SBB(ASCP$^i$) certification examination questions encompass seven different subtests within the area of Blood Banking: Blood Products, Blood Group Systems, Immunology, Laboratory Operations, Physiology and Pathophysiology, Serology and Transfusion Practice. Each of these subtests comprises a specific percentage of the overall 100-question certification examination. The subtests for the BB and SBB examination are described in the following table:

| SUBTESTS | DESCRIPTION | EXAM PERCENTAGES |
|---|---|---|
| **BLOOD PRODUCTS (BP)** | Donors, Processing, Storage, Blood Components, Product Quality Control | **BB: 15 – 20%**<br>**SBB: 15 – 20%** |
| **BLOOD GROUP SYSTEMS (GRPS)** | Genetics, Chemistry, Antigens, Role of Blood Groups in Transfusion | **BB: 15 – 20%**<br>**SBB: 15 – 20%** |
| **IMMUNOLOGY (IMMU)** | Immune Response, Immunoglobulins, Antigen-Antibody Interactions, Complement | **BB: 5 – 10%**<br>**SBB: 5 – 10%** |
| **LABORATORY OPERATIONS (LO)** | Development & Evaluation of New Technology, Safety, Training & Education, Administration & Management*, Quality Assurance, Laboratory Mathematics | **BB: 5 – 10%**<br>**SBB*: 15 – 20%** |
| **PHYSIOLOGY AND PATHOPHYSIOLOGY (PHYS)** | Physiology of Blood, Hemostasis & Coagulation, HDFN, Anemias, Transplantation, HPC | **BB: 5 – 10%**<br>**SBB: 10 – 15%** |
| **SEROLOGIC AND MOLECULAR TESTING (SER)** | Routine Tests, Reagents, Applications of Special Tests & Reagents, Leukocyte/Platelet Testing, Quality Assurance | **BB: 20 – 25%**<br>**SBB: 20 – 25%** |
| **TRANSFUSION PRACTICE (TRNS)** | Indications for Transfusion, Component Therapy, Adverse Effects of Transfusion, Hemapheresis & Extracorporeal Circulation, Blood Administration & Blood Management | **BB: 15 – 20%**<br>**SBB: 15 – 20%** |

For a more specific overview of the seven subtest areas on the BB(ASCP), BB(ASCP$^i$), SBB(ASCP), and SBB(ASCP$^i$) certification examinations, please refer to the **CONTENT OUTLINE** on pages 2 – 3.

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## EXAMINATION CONTENT OUTLINE

**IMPORTANT:** Examination questions, which are related to the subtest areas outlined below, may be both theoretical and 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, evaluate laboratory data, and follow quality assurance protocols

### I. BLOOD PRODUCTS (BB & SBB 15 – 20%)

**A. Donors**
1. Selection
2. Collection techniques
3. Adverse reactions
4. Special Donations (e.g., autologous)

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

**C. Storage**
1. Anticoagulants/preservatives
2. Storage/refrigeration requirements
3. Transportation
4. Properties of stored products

**D. Blood Components**
1. Red blood cells
2. Fresh frozen plasma
3. Cryoprecipitated AHF
4. Platelets
5. Plasma
6. Leukocyte-reduced components
7. Red blood cells deglycerolized
8. Apheresis products
9. Fractionation products
10. Whole blood
11. Washed red blood cells
12. Rejuvenated red blood cells
13. Gamma irradiated components
14. Hematopoietic progenitors

**E. Product Quality Control**

### II. BLOOD GROUP SYSTEMS (BB & SBB 15% – 20%)

**A. Genetics**
1. Basic
2. Molecular
3. Inheritance of blood groups
4. Applied
5. Parentage

**B. Chemistry, Antigens**
1. ABO
2. Lewis
3. Rh
4. MNS
5. P, Globoside
6. Ii
7. Kell
8. Kidd
9. Duffy
10. Lutheran
11. Other
12. Antigens of high incidence
13. Antigens of low incidence
14. HLA
15. Platelet specific
16. Granulocyte specific

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

### III. IMMUNOLOGY (BB & SBB 5 – 10%)

**A. Immune Response**
1. Primary and secondary response
2. B and T cells, macrophages
3. Genetics

- **B. Immunoglobulins**
  1. Classes and subclasses
  2. Structure
  3. Biologic and physiochemical
- **C. Antigen-Antibody Interactions**
  1. Principles
  2. Testing
     a. Principles
     b. Methods
- **D. Complement**
  1. Classical and alternative pathway mechanisms
  2. Biologic properties

## IV. LABORATORY OPERATIONS (BB 5 – 10%; SBB 15 – 20%)

- **A. Development and Evaluation of New Technology**
- **B. Safety**
  1. Safety programs and practices
  2. Emergency procedures
- **C. Training and Education**
- **D. Administration and Management***
  1. Laboratory and Personnel Management
  2. Tissue management, storage and distribution
- **E. Quality Assurance**
  1. Equipment
  2. Computers
  3. Compliance
  4. Other
- **F. Laboratory Mathematics**

## V. PHYSIOLOGY AND PATHOPHYSIOLOGY (BB 5 – 10%; SBB 10 – 15%)

- **A. Physiology of Blood**
  1. Circulation and blood volume
  2. Composition and function of blood
     a. Normal function
     b. Abnormal physiology
  3. Cell survival
  4. Cell metabolism
- **B. Hemostasis and Coagulation**
  1. Coagulation factors and disorders
  2. Platelet functions and disorders
- **C. Hemolytic Disease of the Fetus and Newborn**
  1. Pathophysiology
  2. Detection
  3. Treatment
  4. Prevention
- **D. Anemias**
  1. Congenital and acquired
     a. Pathophysiology
     b. Detection
     c. Treatment
  2. Immune hemolytic anemias: warm, cold, drug-induced
     a. Pathophysiology
     b. Detection
     c. Treatment
- **E. Transplantation**
- **F. Hematopoietic Progenitor Cells (HPC)**

## VI. SEROLOGIC AND MOLECULAR TESTING (BB & SBB 20 – 25%)

- **A. Routine Tests**
  1. AABB standards and requirements
  2. Blood grouping tests
  3. Compatibility tests
     a. Antibody detection
     b. Crossmatch
  4. Antibody identification/clinical significance
  5. Direct antiglobulin testing
- **B. Reagents**
  1. Antiglobulin sera
  2. Blood grouping sera
  3. Reagent red cells
  4. Other
- **C. Application of 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 (e.g., PCR, RFLP)
  10. Neutralization/inhibition
  11. Use of thiol reagents
  12. Immunofluorescence
  13. Solid phase
  14. Column agglutination test
  15. Other
- **D. Leukocytes/Platelet Testing**
  1. Cytotoxicity

2. Platelet testing
3. Granulocyte testing
4. Molecular techniques

**E. Quality Assurance**

1. Blood samples
2. Reagents
3. Test procedures

## VII. TRANSFUSION PRACTICE (BB & SBB 15 – 20%)

**A. Indications for Transfusion**

**B. Component Therapy**

**C. Adverse Effects of Transfusion**

1. RBC/platelet destruction
   a. Physiology
   b. Detection (serologic, biochemical, clinical)
   c. Treatment
2. Leukocyte/plasma protein reactions
3. Nonimmunologic reactions
4. Disease transmission
5. Graft vs. host disease

**D. Hemapheresis and Extracorporeal Circulation**

**E. Blood Administration and Blood Management**

*** SBB(ASCP) and SBB(ASCPi) Certification Exams ONLY**

**All Board of Certification examinations use conventional and SI units of results and reference ranges. In questions pertaining to regulations, use AABB Standards unless otherwise indicated.**

***END OF CONTENT GUIDELINE***