

Director Exam Question 1.

All of the following are appropriate quality assurance monitors EXCEPT:

- A. evaluation of test turnaround time.
- B. guidelines for the prioritization of tests.
- C. completeness of information on test requisitions
- D. tabulation of specimens received during a fiscal year

Director Exam Question 2.

Which of the following are contamination control or monitoring measures required by ASHI for DNA-based typing methods?

- 1. Preamplification procedures must be performed in a dedicated work area.
  - 2. "No DNA" or "open tube" controls must be included with each assay.
  - 3. All reagents utilized in the amplification assay must be dispensed in aliquots sufficient for 1 week of use.
  - 4. Routine wipe tests of preamplification work areas must be performed.
- A. 1, 2, and 3 only.
  - B. 1, 2, and 4 only.
  - C. 1, 3, and 4 only.
  - D. 2, 3, and 4 only.

Director Exam Question 3.

A new employee has worked in a histocompatibility laboratory abroad for a number of years prior to moving to the United States. The best way for the director to check the employee's competency is to

- A. request local references.
- B. make inquiries of the individual's previous employ.
- C. put him through a structured new employee training program and have the general supervisor sign off on each satisfactorily complete task.
- D. determine if the tests performed by this individual in the previous laboratory were of similar complexity to those he will be expected to perform.

Director Exam Question 4.

Which of the following is a common occurrence in patients with chronic graft-versus-host disease?

- A. Post-transplant lymphoproliferative disorder.
- B. Graft rejection.
- C. Disease relapse.
- D. Immune deficiency.

Director Exam Question 5.

A bone marrow transplant program routinely screens potential donors by low-resolution DR typing. Follow-up by high-resolution typing (allelic level) is pursued only on those donors who may be a five-antigen match or better. With the listed results, which of the following potential donors should have high-resolution typing to confirm an allelic match at the DR?

Recipient A1,2; B7,8; DR15,3

Donor 1 A1,--; B8,--; DR3,--

Donor 2 A1,2; B7,27; DR15,3

Donor 3 A2,--; B7,8; DR15,16

Donor 4 A1,2; B8,--; DR3,4

- A. Donor 1
- B. Donor 2
- C. Donor 3
- D. Donor 4

Director Exam Question 6.

In a population, the relative risk an individual may have to develop HLA-associated Disease X can be estimated from the 2 x 2 table summarized below:

RELEVANT HLA ANTIGEN	DISEASE X		
	Positive	Negative	TOTAL
Positive	850	950	1800
Negative	150	8050	8200
Total	1000	9000	10,000

In this population, what is the relative risk that an individual with the disease will have the relevant antigen?

- A. 4.8
- B. 5.7
- C. 25.8
- D. 48.0

Director Exam Question 7.

A 44-year-old patient with acute myelogenous leukemia in second clinical remission has the following HLA type:

A\*0101,\*0301; B\*0702,\*0801; DRB1\*0301,\*1502; DQB1\*0201,\*0501; DRB3\*0101; DRB5\*0102

Which of the following potential donors would be the BEST for an unrelated bone marrow transplant?

- A. A\*0101,\*0301; B\*0702; DRB1\*0301,\*1502; DQB1\*0201,\*0501; DRB3\*0101; DRB5\*0102
- B. A\*0101,\*0301; B\*0702,\*0801; DRB1\*0301,\*1502; DQB1\*0201,\*0601; DRB3\*0101; DRB5\*0102
- C. A\*0101,\*0301; B\*0702,\*0801; DRB1\*0302,\*1502; DQB1\*0201,\*0501; DRB3\*0101; DRB5\*0101
- D. A\*0101,\*0301; B\*0702,\*0801; DRB1\*0302,\*1501; DQB1\*0201,\*0501; DRB3\*0101; DRB5\*0101

Director Exam Question 8.

To preserve the cell viability of blood samples in transit for over 48 hours, the blood should be

- A. refrigerated.
- B. defibrinated.
- C. collected in ACD.
- D. collected in heparin.

Director Exam Question 9.

Oligonucleotide directed mutagenesis has caused a single base change in the second exon of the DRB1 gene. Which of the following substitutions would cause the greatest change in Tm of the oligonucleotide?

- A. G to C
- B. T to A
- C. T to G
- D. T to U

Director Exam Question 10.

The phycoerythrin conjugated anti-CD3 used in flow cytometric crossmatch assays initially bound 70% of peripheral blood lymphocytes from a control donor. Cells from the donor were frozen to be used serially as a control sample. The PE-CD3 has been maintained at 4°C for the past 60 days. For the past 2 weeks, the percentages of control PBL binding the PE-CD3 have been steadily declining, although the percentages of cells expressing other surface markers are normal. In addition, the values of patient specimens during this time have all been less than normal, although the expression of other cell surface markers remains within normal limits. Which of the following is the MOST likely cause?

- A. Phycoerythrin has leached off the CD3 antibody.
- B. There is a technical error due to inappropriate instrument calibration.
- C. CD3 is not expressed on frozen PBLs due to temperature fluctuations of the freezer.
- D. The ambient laboratory temperature is preventing optimal antigen-antibody binding.

Director Exam Question 11.

During an inspection, the laboratory director is asked to explain the source of the 750 bp SSP-PCR product found in each lane of a low-resolution HLA-DR typing, except the negative control lane. What does this band represent?

- A. It is a primer dimer due to 3' complementation of PCR primers.
- B. It is a contaminant because it is not found in the negative control.
- C. It is an internal standard used to ensure adequate amplification conditions.
- D. It is a PCR artifact that can be ignored because it is not clinically significant.

Director Exam Question 12.

Teaching individuals to perform test validation should include assessment of which of the following test characteristics?

- A. Sensitivity, specificity, accuracy, reproducibility, and cost.
- B. Sensitivity, specificity, turnaround time, reproducibility, and cost.
- C. Reagent stability, instrument calibration, training, quality control, and turnaround time.
- D. Accuracy, precision, sensitivity, specificity, and reference ranges.

Director Exam Question 13.

Two sera show B57 activity patterns as listed below:

Cell phenotype	Serum #1	Serum #2
A1,2; B57,60	8	8
A3,26; B35,38	1	1
A2,30; B13,65	1	1
A24,25; B55,57	4	8
A23,30; B57,62	8	8
A1,2; B7,58	2	8
A24,29; B44,63	1	8
A1,3; B35,57	4	8

Which of the following reagents is superior for defining B57?

- A. Serum 1, because it has a high r value.
- B. Serum 1, because it does not react with B63.
- C. Serum 2, because it has a high percent inclusion.
- D. Serum 2, because it reacts with the B17 CREG group.

Director Exam Question 14.

Organ donation has not kept pace with the number of potential recipients waiting for kidney transplants. Most outreach programs for general education of the public about organ donation are successful when recruiting the assistance of

- A. transplant surgeons.
- B. the news media.
- C. neurosurgeons.
- D. emergency department nurses.

Director Exam Question 15.

After the activation of a T cell receptor, which of the following reflects the sequential order of signal transduction events?

- A. Tyrosine phosphorylation, Ca<sup>++</sup> mobilization, and activation of cytokine genes.
- B. Ca<sup>++</sup> mobilization, tyrosine phosphorylation, and activation of cytokine genes.
- C. Activation of cytokine genes, tyrosine phosphorylation, and Ca<sup>++</sup> mobilization.
- D. Tyrosine phosphorylation, activation of cytokine genes, Ca<sup>++</sup> mobilization.

Director Exam Question 16.

The MOST important factors for laboratory directors to consider when evaluating their own personal training and educational needs are

1. technologies used in the field.
2. types of clinical cases for which the laboratory tests.
3. number and experience of laboratory personnel.
4. funds in the educational budget.

- A. 1, 2, and 3 only.
- B. 1, 2, and 4 only.
- C. 1, 3, and 4 only.
- D. 2, 3, and 4 only.

Director Exam Question 17.

Which of the following statements is true about the base pairing between two single strands of DNA?

- A. It does not depend on DNA concentration or time.
- B. It is a process that takes place during the PCR reaction.
- C. It will always generate perfectly matched hybrids, even under nonstringent conditions.
- D. It is carried out under high stringency conditions of high salt concentrations and 20°C.

Director Exam Question 18.

Which of the following mechanisms BEST describes primary alloimmunization following organ transplantation into a non-immune recipient?

- A. Soluble antigen is released into the circulation and sensitizes follicular dendritic cells in lymph nodes.
- B. Recipient follicular dendritic cells migrate into the allograft and then present antigen.
- C. Donor dendritic cells from graft migrate to lymph nodes and present antigen.
- D. Naïve recipient T-cells migrate to graft and become sensitized.

Director Exam Question 19.

A donor is sought for a potential recipient of a kidney transplant whose HLA phenotype is A1,29; B7,50. Which of the following donors has the greatest potential to induce high-frequency alloantibodies?

- A. A1,2; B27,44
- B. A1,28; B8,50

- C. A2,28; B7,50
- D. A2,29; B35,45

Director Exam Question 20.

Laboratories interested in understanding the role of cytokines in transplantation might investigate genetic differences affecting the levels of expression of the

- A. pro-inflammatory cytokines IL-2 and IL-10.
- B. pro-inflammatory cytokines TNF-a and IFN-g.
- C. anti-inflammatory cytokines TNF-a and TGF-b.
- D. anti-inflammatory cytokines TGF-b and IFN-g.

**Answer Key**

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Item #	Key
1.	D
2.	B
3.	C
4.	D
5.	B
6.	C
7.	B
8.	C
9.	C
10.	A
11.	C
12.	D
13.	A
14.	B
15.	A
16.	B
17.	B
18.	C
19.	A
20.	B