



**TECHNICAL UNIVERSITY OF MOMBASA**

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FACULTY OF APPLIED AND HEALTH SCIENCES  
DEPARTMENT OF MEDICAL SCIENCES  
**UNIVERSITY EXAMINATION FOR:**  
DIPLOMA IN MEDICAL LABORATORY SCIENCE  
AML 2206 : BLOOD TRANSFUSION TECHNIQUES  
END OF SEMESTER EXAMINATION

**SERIES:** DECEMBER 2016

**TIME:** 2 HOURS

**DATE:** Pick Date Select Month Pick Year

**Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of **TWO** Section(s). Attempt ALL questions.

**Circle the correct answer in section A.**

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Section A

1. Low ionic strength solutions may be used for the following reasons
  - a. Lower the Isoelectric point of the medium
  - b. Increase the ionic concentration of the medium
  - c. Increase the distance between red cells
  - d. Increase the surface of shear
2. The following antigens do not exhibit dosage effect
  - a. K
  - b. Jk<sup>a</sup>
  - c. D
  - d. E

3. The following are characteristic of IgG except
  - a. Have a J-chain
  - b. Have a molecular weight of 180000
  - c. Can be transferred through the placenta
  - d. They resist denaturation at 56<sup>0</sup>C
  
4. When the mother is blood group A<sub>2</sub> and the father blood group O the following blood types are not possible
  - a. A<sub>1</sub>
  - b. A<sub>2</sub>
  - c. O
  - d. A<sub>2</sub>B
  
5. Partial D occurs due to?
  - a. Expression of altered D proteins
  - b. Position effect especially when C is in trans to D
  - c. Missing D epitopes
  - d. Lack of gene D
  
6. Titration of anti-D may be done so as to?
  - a. To obtain anti-D for serum grouping
  - b. Determine anti-D in foetal serum
  - c. Obtain anti-C for *trans* detection
  - d. Use antihuman globulin
  
7. Rh Anti-D may cause haemolytic disease of the newborn in one of the following
  - a. Maternal anti-D titre falls below 6
  - b. Maternal anti-D titre rises to 16
  - c. Foetal cells are D negative
  - d. Foetal cells are ABO incompatible with maternal sera
  
8. To make 2% Red cell suspension we need \_\_\_mls of saline and \_\_\_\_mls of packed cells
  - a. 5 and 0.1
  - b. 4.9 and 0.2
  - c. 2.8 and 0.2
  - d. 9.8 and 0.2

9. The following statement is are true of naturally occurring antibodies
- Occur in persons having come into contact with relative antigen
  - Does not occur in persons having specific antigen
  - May occur without prior antigenic stimulus
  - Occurs in persons seemingly not having come into contact with specific antigen
10. The following temperature conditions are favorable for naturally occurring antibodies
- 37°C
  - 25°C
  - 0°C
  - 12°C
11. The reaction of IgM in different media is as follows; which statement is false?
- Immune IgM reacts more strongly in saline
  - Natural IgM reacts strongly in saline
  - Immune IgM reacts more strongly in serum
  - Natural IgM reacts strongly in serum and saline
12. In applying the law of mass action, the equilibrium constant of antigen antibody reactions depends on?
- Ionic strength of the antibody
  - Ionic strength of the medium
  - The pH of the medium
  - The pH of the antigen
13. The electric potential that pushes red cells apart is also known as
- Theta potential
  - Isoelectric point
  - Zeta potential
  - Ionic strength

14. The following are known Rh blood group antigens except
- c
  - d
  - D
  - E
15. The following statements are true of naturally occurring antibodies
- Act weakly at 4°C
  - Act strongly at 4°C
  - They are predominantly IgM
  - may not be anti-M or anti-N
16. The following is characteristic of IgG
- Have a J-chain
  - Have a molecular weight of 220000
  - Cannot be transferred through the placenta
  - They resist denaturation at 56°C
17. Dolichos bifloras is well known due to
- Its ability to react with red cell antigens
  - Its specificity to anti-A
  - Its specificity to anti-A<sub>1</sub>
  - Its reaction with anti-H
18. In blood grouping the following may cause false positive results except
- Dirty and cloudy tubes
  - Cold autoantibodies
  - Impotent sera
  - Rouleaux factors
19. The process by which antibodies coated onto the red blood cells are re-suspended back into solution is referred to as?
- Eluate
  - Elution
  - Diluent
  - Solvency

20. Non-specific results during elution may be as a result of?
- Development of potency of solvents upon storage
  - Deterioration of solvents upon storage
  - Analytical grade solvents
  - Use of 6% bovine serum albumin
21. The elution technique employing heat as the elution agent attempts to recover the following antibodies
- IgA anti-A or anti-B in Hemolytic disease of the newborn
  - IgM anti-A in transfusion reactions
  - IgG anti-D during Rhesus grouping
  - IgG anti-A,B in blood group O mothers
22. The use of bubbling air into the eluate is mainly in order to?
- Aerate the elute
  - Aerate the antibodies to normal
  - Remove the residual ether
  - Remove the deposits
23. During the heat ether technique, the first heat incubation phase should be for how long?
- 2 minutes without agitation
  - 15minutes without agitation
  - 15 minutes with periodic agitation
  - 2 minutes with vigorous agitation
24. The following solvents have been used for elution except?
- Digitonin
  - Xylene
  - Cold acid
  - Benzene
25. Blood group antibodies may be classified in the following ways
- Artificial
  - Pure
  - Natural
  - Immune

26. Serum donor exclusions\_\_\_\_\_.
- Are different from other blood donors
  - Are the same as other blood donor exclusion criteria
  - Are determined by the clinicians
  - May be ignored from time to time
27. Serum purification methods include the following except?
- Filtration
  - Absorption
  - Reverse osmosis
  - Centrifugation
28. Suitability of sera is determined using especially three tests that include some of the following
- Test for avidity
  - Test for blood groups
  - Test for specificity
  - Test for Rh
29. The following is true in testing for avidity
- This is time taken for antibody to cause visible agglutination
  - Avid sera react after 15minutes
  - Avid sera react within 15seconds
  - Centrifugation is used in determining avidity
30. The purpose of titrating Natural antibodies is to?
- Find antibody concentration in grouping sera
  - Determine the type of antibody present in a given sample
  - Determine severity of Hemolytic disease of the newborn/foetus
  - Check for Chimerism
31. During titration, dilution refers to?
- Mixing known serum and saline volumes
  - Mixing known serum and albumin volumes
  - Mixing known cell volumes with saline
  - Mixing known serum volumes with Cells

32. Information that should appear on adhesive labels should include the following except?
- Manufacture and expiry dates
  - Type of antibody class included
  - Donor description
  - Type of antigen present
33. Sera may be refrigerated so as to avoid the following
- Thawing
  - Deterioration
  - Usage
  - mishandling
34. To remedy a situation of error involving rouleaux, the following is done.
- Repeat the grouping immediately
  - Wash the cells three times in saline and repeat the test
  - Use a higher concentration of cells
  - Add albumin to the test tube
35. Warming of ABO blood group antibodies to 37°C results in?
- Good results
  - False positive results
  - False negative results
  - Good agglutination
36. Weak reacting antigen A has the following characters
- They agglutinate slowly
  - They show a weak reaction
  - They agglutinate strongly at room temperature
  - Agglutinate strongly in saline
37. The presence of free hemoglobin in supernatant serum during grouping means that?
- There was antigen-antibody reaction
  - There was contamination in the Red Cells
  - There was no reaction
  - The serum used was inappropriate

38. False positive results in blood group serology may be due to?

- a. Dirty glassware
- b. Failure to incubate
- c. Shaking tubes too hard
- d. Auto immune antibodies

39. The following statements are true concerning subgroups of A except?

- a. A<sub>1</sub> is the most reactive of all the subgroups
- b. 20% of all A blood is A<sub>1</sub>
- c. Subgroups of A other than A<sub>1</sub> show weak agglutination
- d. A<sub>1</sub> genotypes include A<sub>1</sub>A<sub>1</sub>, A<sub>1</sub>O and A<sub>1</sub>A<sub>2</sub>

40. Cell suspensions for use in blood grouping should be?

- a. Free from serum proteins
- b. Haemolyzed
- c. Unwashed
- d. Free from haemoglobin



Section B

41. Using the chart below identify the antibodies present in the given serum (show identification pattern)

(20mks)

Cell Number	D	C	E	c	e	f	M	N	S	s	P1	Lea	Leb	K	k	Fya	Fyb	Jka	Jkb	IS	37	AHG
1	0	+	0	+	+	+	+	+	+	+	+	+	0	0	+	+	+	+	0	2+	0	0
2	+	+	0	0	+	0	+	+	0	+	+	0	+	0	+	0	+	+	0	0	0	0
3	+	+	0	0	+	0	+	0	+	+	+	0	+	+	+	+	+	0	+	0	0	0
4	+	0	+	+	0	+	+	+	0	+	+	+	0	0	+	0	+	+	+	0	0	0
5	0	0	+	+	+	+	0	+	+	0	+	0	+	0	+	0	+	+	+	2+	0	0
6	0	0	0	+	+	+	+	0	0	+	+	0	+	0	+	+	0	+	+	0	0	0
7	0	0	0	+	+	+	+	+	+	+	+	+	0	0	+	0	+	0	+	2+	0	0
8	0	0	0	+	+	+	+	+	0	+	+	0	0	+	+	0	0	+	0	0	0	0
9	0	0	0	+	+	+	+	0	+	0	0	+	0	0	+	0	+	+	+	2+	0	0
10	0	0	0	+	+	+	+	0	0	+	0	0	+	+	+	+	0	+	0	0	0	0
11	0	0	0	+	+	+	0	+	0	+	0	0	+	0	+	+	+	+	+	0	0	0
Patient Typing																				0	0	0
INTERPRETATION:																						



42. Discuss the following

- a. Factors affecting the success of elution 10mks
- b. Phases of crossmatch 10mks

43. Answer the following questions on transfusion techniques

- a. List down the contents of a crossmatch label 5mks
- b. Outline the procedure for specificity 5mks
- c. Describe the procedure for serum grouping 10mks

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