AFRICA UNIVERSITY
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"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE & NATURAL SCIENCES

SLS 406 BLOOD BANK II

END OF SECOND SEMESTER FINAL EXAMINATIONS

APRIL/MAY 2019

LECTURER: Menard Mutenherwa

DURATION: 3 HOURS

INSTRUCTIONS

1. Do not write your name on the answer sheet
2. Use Answer Sheets Provided
3. Begin your answer for Each Question on a New Page
4. Credit is Given for Neat Presentation
5. The paper comprises of three sections. Section A, section B and Section C. Section A is compulsory and carries 40 marks. Answer all questions in section A. Each question consists of an incomplete statement or sentence followed by FOUR (4) possible answers. You are required to indicate which answer is true or false by circling either T=true or F=false next to the appropriate answer. If you do not know the correct answer, leave it not circled.
6. Section B is compulsory and carries 20 marks. Answer all questions in section B
7. Section C has five questions and each question carries 20 marks. Answer three (3) Questions from section C.
8. Where a question contains subdivisions, the mark value for each subdivision is given in brackets.

Section A

1		**A group and screen is ordered for a patient. The Blood Bank say blood will not be available for 3 hours because the antibody screen is positive. What does this mean?**		
	a	The patient has a red blood cell alloantibody	T	F
	b	There is blood shortage	T	F
	c	The Scientist is on tea break	T	F
	d	The patient has Plasmodium falciparum	T	F
2		**Which of the following patients is most likely going to have a positive antibody screen?**		
	a	A pregnant woman, blood group O Rh (D) positive	T	F
	b	Child with sickle cell disease on a regular transfusion programme	T	F
	c	A child with SCID	T	F
	d	A 2 year old boy newly diagnosed with ALL	T	F
3		**Washed red blood cells are sometimes used for transfusion in the following conditions (Choose incorrect response)**		
	a	Jehovah`s witness	T	F
	b	IgA deficiency	T	F
	c	Paroxymal Nocturnal haemoglobinuria	T	F
	d	Necrotising enterocolitis with positive lectin screen	T	F
4		**A healthy term infant with blood type A+ is born to a mother, blood type O - . The infant is now 15 hours old with a total bilirubin of 10 mg/dl. The infant's DAT for IgG is positive, 3+. When an eluate was performed, which antibody specificity was identified:**		
	a	anti-D IgM	T	F
	b	anti-A,B IgG	T	F
	c	anti-A IgM	T	F
	d	anti-d IgG	T	F

5		**The following is true for a child who has inherited the Q allele from its heterozygous (P,Q) mother, and its R allele from its biological (R;R) father (BF).**		
	a	If the alleged father (AF) is the BF, the probability of inheriting R is 1.0.	T	F
	b	If a random man is the BF, the probability of inheriting R is the frequency of R in the AF's ethnic population.	T	F
	c	If a random man is the BF, the probability of inheriting R is not the frequency of R in the AF's ethnic population.	T	F
	d	If the alleged father (AF) is the BF, the probability of inheriting R is 0.5	T	F
6		**If two brothers are accused of paternity**		
	a	Each man may be considered an alleged father (AF)	T	F
	b	There are three states of nature (SONs)	T	F
	c	All three hypotheses are assigned equal (0.33) prior probabilities	T	F
	d	The sum of prior probabilities of the mutually exclusive hypotheses must total 1.0	T	F
7		**Polymerase Chain Reaction (PCR)in paternity**		
	a	is similar to RFLP in that it uses DNA.	T	F
	b	has a power of exclusion of 99.99% or greater.	T	F
	c	produces very few copies of select portions of DNA from a small sample	T	F
	d	has been extensively used for DNA testing	T	F
8		**The basics of pathology is asthma are:**		
	a	Local vasodilation	T	F
	b	Increased capillary secretion	T	F
	c	Excess eosinophils in tissue secretions and blood	T	F
	d	All of these	T	F
9		**Autoimmune haemolytic anaemia classes are**		
	a	Warm-reactive	T	F
	b	Cold reactive	T	F
	c	Drug induced	T	F
	d	paroxysmal cold haemoglobinuria	T	F

10		**An undesirable consequence of immunity is**		
	a	Acquired resistance to infectious diseases	T	F
	b	Natural resistance	T	F
	c	Recovery from an infectious disease	T	F
	d	An autoimmune disorder	T	F
11		**The type of immunoglobulin involved in type 1 hypersensitivity is:**		
	a	IgM	T	F
	b	IgG	T	F
	c	IgE	T	F
	d	IgD	T	F
12		**Causes of autoimmune diseases include**		
	a	Sequestered or hidden antigens	T	F
	b	Neo antigens	T	F
	c	Cessation of tolerance	T	F
	d	Cross reacting antigens	T	F
13		**Localised or organ specific autoimmune diseases include**		
		Multiple sclerosis	T	F
		Grave`s disease	T	F
		Malaria	T	F
		Myasthenia gravis	T	F
14		**These are complications of Rheumatoid arthritis**		
	a	Ruptured tendons	T	F
	b	Spinal cord compression	T	F
	c	Ruptured joints	T	F
	d	Joint infection	T	F
15		**For autoimmune diseases, autoantibodies are demonstrated by**		
	a	Haemaggultination	T	F
	b	Complement fixation test	T	F
	c	Radio immuno assay	T	F
	d	Immunofluorescent antibody test	T	F

16		**Western blot quality control in HIV testing requires**		
	a	Testing with strongly positive sample	T	F
	b	Testing with weakly positive sample	T	F
	c	Testing with negative sample	T	F
	d	Testing with neither positive, weak, nor negative sample	T	F
17		**ELISA tests are useful for**		
	a	Screening blood products	T	F
	b	Diagnosing and monitoring patients	T	F
	c	Determining prevalence of infection	T	F
	d	Research investigations	T	F
18		**The following are types of autologous transfusion**		
		Family replacement blood donation	T	F
		Commercial blood donation	T	F
		Intra-operative cell savage	T	F
		Acute normovolaemic haemodilution	T	F
19		**Bruton`s hypogammaglobulinemia is indicative of what type of cell?**		
	a	B cell	T	F
	b	Macrophage	T	F
	c	T cell	T	F
	d	Neutrophil	T	F
20		**The following are pathological transfusion reactions**		
	a	Transfusion-Associated Graft versus Host Disease (TA-GvHD)	T	F
	b	Transfusion-Associated Circulatory Overload (TACO)	T	F
	c	Transfusion-Associated Dyspnoea (TAD	T	F
	d	Transfusion-Related Acute Lung Injury (TRALI)	T	F

Section B
Section B is compulsory and carries 20 marks
Answer all questions in section B

1. List four (4) types of autologous human blood transfusion [4]

2. Name the four (4) hypersensitivity types [4]

3. A child receives half of his or her genetic material (……..…….) from the biological ……, and half from the biological…… [3]

4. Briefly describe pathogenesis of hyper-IgM syndromes [4]

5. For each of the types of immunological deficiency states listed on the below select the most appropriate association from those given. [5]

a. Di George syndrome……
b. Infantile sex-linked agammaglobulinaemia……
c. Severe combined immunodeficiency……...
d. Wiskott-Aldrich syndrome……
e. ataxia telangiectasia……

A. Defective B-cell function.
B. Defective B- and T-cell function.
C. Defective T-cell function.
D. Defective platelets.
E. Defective vessels

Section C

Section C has five (5) questions and each question carries 20 marks
Answer three (3) Questions from section C.
Where a question contains subdivisions, the mark value for each subdivision is given in brackets.

1. Outline the pathogenesis of haemolytic disease of the new born (HDN). [20]

2. Display your knowledge of blood banking by describing the adverse effects of transfusion. [20]

3. Select any **one** congenital immunodeficiency disease and describe its pathogenesis, laboratory diagnosis, treatment and prevention. [20]

4. Demonstrate your understanding of type IV hypersensitivity reactions and give two examples of a clinical condition that can result from the hypersensitivity reaction. [20]

5. Chechu Chipa is a 25 years old black male Zimbabwean who was accused of fathering the daughter of an un-married waitress in 2017. The table below shows the ABO blood grouping test results for the Chechu Chipa case. The results are from a Paternity laboratory in Harare.

   ABO Test Results of the Chechu Chipa Paternity Case

	Mother	Child	Chechu Chipa (Alleged father)
Blood types (phenotypes)	A	B	O
Possible genotypes	AO or AA	BO or BB	O/O
Child`s maternal marker	-	O or A	-
Child`s paternal marker	-	B	-

   a. Using ABO blood group antigens and Mendelian genetic principles, testify that defendant Chechu Chipa could not have been the child's father. [15 marks]
   b. What recommendations would you propose to the magistrate for this case to be concluded using Laboratory tests? [5 marks]