Candidate Number:…….

AFRICA UNIVERSITY
A United Methodist-Related Institution

"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES

BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS DEGREE

NSLS406: TRANSFUSION SCIENCE AND IMMUNOLOGY

END OF SECOND SEMESTER FINAL EXAMINATIONS

APRIL 2024

LECTURER: Dr Aaron Maramba

DURATION: 3 HOURS

INSTRUCTIONS

1. Write your candidate number on the space provided on top of each page
2. Answer **all** questions in sections A on the question paper.
3. Answer **all** questions in section B on separate answer sheets provided.
4. Answer any **3** questions in section C on separate answer sheets provided
5. Credit will be given for logical, systematic and neat presentations in sections B and C

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SECTION A : MULTIPLE CHOICE [50 MARKS]

- **Answer all questions by encircling the correct response T for TRUE or F for FALSE for each statement in all the questions**
- **Each correct response is allocated half a mark**

1. Immediate immunological adverse effects of transfusion are:

T F a) iron overload

T F b) anaphylaxis

T F c) urticaria

T F d) congestive heart failure

T F e) non-cardiac pulmonary oedema

2. The following blood components are used for intrauterine transfusion (IUT):

T F a) sickle negative blood

T F b) phenotyped blood

T F c) Cytomegalovirus -negative blood

T F d) leucocyte-depleted blood

T F e) washed platelets

3. The following are used in autologous transfusion:

T F a) Regular donation

T F b) Apheresis donation

T F c) Intraoperative cell salvage

T F d) Polymerised haemoglobins

T F e) Acute normvolaemic haemodilution

4. Red cell transfusion is indicated in the following conditions:

T F a) immune thrombocytopenic purpura (ITP)

T F b) Most invasive surgery

T F c) Post partum haemorrhage

T F d) Posterior eye surgery

T F e) Epistaxis with haemoglobin of 120g/L

5. The following are a source of fibrinogen in major haemorrhages:

T F a) Fresh frozen plasma

T F b) Cryoprecipitate

T F c) NovoSeven

T F d) Otaplas

T F e) Albumia

6. The following are used for neonatal exchange transfusion:

T F a) red cells in CPD

T F b) washed red cells

T F c) IAT crosshatch compatible with patient plasma

T F d) long dated blood

T F e) irradiated red cells

7. Rhesus haemolytic disease of the newborn (HDN):

T F a) is of mild form

T F b) mostly has decreased in developed countries

T F c) may also be due to anti-E

T F d) majority of HDN is due to anti-D

T F e) prior immunization is required

8. Adverse transfusion reactions:

T F a) most can not be prevented

T F b) always keep the intravenous line open

T F c) stop the transfusion process immediately

T F d) keep talking to the patient

T F e) all reactions are immunological

9. Therapeutic Apheresis includes:

T F a) red cell exchange transfusion

T F b) erythrocytapheresis

T F c) reticulocyte transfusion

T F d) platelet apheresis

T F e) extracorporeal photopheresis

10. Transfusion of Octaplas is indicated in:

T F a) bleeding patients with deranged coagulation

T F b) for the immediate reversal of warfarin effect

T F c) in IgA deficient patients

T F d) plasma exchange in TTP patients

T F e) in anemic patients going for elective surgery

11. Concerning transfusion in haemato-oncology:

T F a) prevention of CMV transfusion by transfusion

T F b) no red cell transfusion

T F c) prophylactic platelet transfusion

T F d) prophylactic anti-D for mismatched BMT

T F e) long-term transfusion support for myelodysplasia

12. The following are examples of disease that can be treated with plasma exchange:

T F a) PANDAS syndrome

T F b) Multiple myeloma

T F c) McLeod syndrome

T F d) HUS/ TTP

T F e) Multiple sclerosis

13. The following are potentially sensitizing events during pregnancy:

T F a) instrumental or caesarian section delivery

T F b) termination of pregnancy before 12 weeks

T F c) therapeutic termination of pregnancy

T F d) abdominal pain

T F e) cordocentesis

14. The following components are recommended for neonatal red cell exchange:

T F a) CPD anticoagulated red cells

T F b) CMV sero-positive red cells

T F c) short dated red cells

T F d) RhD and Kell identical units

T F e) sickle screen negative

15. The following are blood substitutes where human blood cannot be used:

T F a) aprotinin

T F b) moxygen

T F c) oxygen

T F d) haemocue

T F e) haemopure

16. The following are common allergens associated with type I hypersensitivity:

T F a) Proteins

T F b) Bee venom

T F c) Plant pollen

T F d) Snake venom

T F e) Basophils

17. The following are examples of immunopathologies:

T F a) Inflammation

T F b) Autoimmunity

T F c) Refractory anaemia

T F d) Transfusion

T F e) immunodeficiences

18. Which of the following are causes of cancer?

T F a) Mutations

T F b) Oncogenes

T F c) Radiation

T F d) Mitosis

T F e) Senescence

19. The following white cells are involved in nonspecific immune defense

T F a) T-cells

T F b) B-cells

T F c) Natural Killer (NK) cells

T F d) macrophages

T F e) eosinophils

20. Receptors associated with innate immunity recognize microbes by detecting:

T F a) insulin.

T F b) pathogen associated molecular patterns (PAMPs)

T F c) Toll-like receptors (TLR)

T F d) complement.

T F e) cytokines.

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SECTION B: [25 MARKS]

Answer all questions

1. List four (4) types of autologous human blood transfusion (4 marks)
2. State any four (4) indications for plasma exchange (4 marks)
3. List any five (5) regular blood products (5 marks).
4. List any three (4) special blood products given to bone marrow transplant patients (4 marks)
5. Give any four (4) potentially sensitising events in Rhesus D negative mothers (4 marks)
6. Name the four (4) hypersensitivity types (4 marks)

SECTION C: LONG ESSAYS [60 Marks]

Instructions: Answer any <u>three</u> questions and each question carries *20 marks*

1. Discuss the blood products selected for transfusion to allogenic bone marrow recipients.
2. Demonstrate your understanding of type IV hypersensitivity reactions and give two examples of a clinical condition that can result from the hypersensitivity reaction.
3. With the help of examples discuss measures that are employed as alternatives to allogenic red blood cells transfusion.
4. Choose one haemovigilance system and describe its scope, requirements, setting, advantages and disadvantages.
5. Select any **one** congenital immunodeficiency disease and describe its pathogenesis, laboratory diagnosis, treatment, and prevention.
6. Outline the use of therapeutic apheresis in modern day blood transfusion practice.