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University Examinations 2024/2025

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICAL LABORATORY SCIENCES

SECOND YEAR FIRST SEMESTER BACHELOR OF MEDICAL LABORATORY SCIENCES

HML 3314/HMU 3214: BLOOD TRANSFUSION SCIENCE

DATE: JANUARY 2024 **TIME: 3 HOURS**

INSTRUCTIONS:
Answer ***All*** *questions*
Ensure that all your answers are properly numbered
Part I multiple Choice Questions (MCQ): Write the correct answer on the space provided in the answer booklet. Each MCQ is one mark
Part II: Short Answer Questions – Answer questions following each other on the answer booklet
Part III: Long Answer Questions – Answer each question on the answer booklet

SECTION A: MULTIPLE CHOICE QUESTIONS (20 marks)

1. Two genes are close to each other and are inherited together as a unit. The combination of the two genes that are inherited together is known as a:
   a) Genotype
   b) Haplotype
   c) Phenotype
   d) Amorph

2. In blood transfusion medicine, an antibody screen is performed to:
    a) Identify the blood type of a patient.
    b) Detect the presence of unexpected antibodies in a patient's blood that could cause a transfusion reaction.
    c) Determine the Rh factor of a patient.
    d) Assess the patient's platelet count.
3. The Bombay phenotype is comprised of a genetic combination of:
    a) Oh
    b) HH
    c) Hh
    d) All the above
4. Blood platelets in stored blood not remain functional after;
    a) 48hours
    b) 4 hours
    c) 72 hours
    d) 96hours
5. Choose the correct. statement regarding ABO antigens:
    a) Newborns have fewer ABO antigens than adults
    b) Adults have fewer ABO antigens than newborns
    c) Newborns have the same number of ABO antigens as adults
    d) Newborns have only the ABO antigens that they have acquired from the maternal serum
6. The antigen missing in the Rh negative individual is:
    a) C
    b) C
    c) D
    d) d
7. When two allelic genes are a like , the individual is said to be
    a) Heterozygous

b) Co-odominant
c) Dominant
d) Homozygous

8. Which of the following tests is used to determine if there is a hemolytic reaction occurring in the recipient's blood after transfusion?
   a) Antibody Screen
   b) Direct Coombs Test
   c) Blood Typing
   d) Crossmatch
9. A patient was transfused two weeks before his current testing. He is exhibiting a positive DAT and a positive antibody screen in both cells at the Al-IG phase. The autoantibody may be removed from the serum using:
   a) Heat elution
   b) Enzyme treated cells
   c) Autoadsorption
   d) Allogeneic adsorption
10. Labeling of recipient's blood sample for pre-transfusion testing does not need to include the following:
   a) Patient's name
   b) Identification number
   c) ABO group
   d) Collection date
11. The administration of a blood to a 25 year-old woman who is hemorrhaging is necessary on an emergency basis. The best choice for initial transfusion is:
   a) Type specific
   b) O positive
   c) O negative
   d) No blood should be transfused without pretransfusion testing

12. A recipient is AB negative, the supply of type specific blood has been exhausted

The best choice for substitution is:

a) O negative

b) A negative

c) A positive

d) AB positive

13. Which of the following is not a method for preparation of leukocyte reduced red cells:

a) Differential centrifugation

b) Filtration

c) Freezing and deglycerolization

d) Washing of red cells

14. Cryoprecipitate may be used to correct a deficiency of all the following except:

a) Factor I

b) Factor Vll

c) Factor Vlll

d) VonWillebrand's factor

15. Whole blood is shipped:

i.1 to 6^0C

ii.1 to 100C

iii.unrefrigerated

iv.with wet ice

v.with dry ice

a) only 3 is correct

b) 1 and 4 are correct

c) 1 and 5 are correct

d) 2 and 4 are correct

16. A patient presents with hives and itching 1/2 hour into his transfusion of packed red blood cells. The following step should be taken:

a) Discontinue the transfusion and proceed with a transfusion reaction work up
b) Discontinue the transfusion until all symptoms resolve
c) Continue transfusion after medicating with antihistamine
d) Continue monitoring patient after medicating with broad spectrum antibiotics

17. What is the primary purpose of intrauterine transfusion (IUT)?
    a) To correct fetal metabolic acidosis.
    b) To manage severe fetal anemia.
    c) To reduce maternal-fetal transmission of infections.
    d) To treat fetal pulmonary hypoplasia.
18. Most desirable sample used for crossmatch for an exchange transfusion is:
    a) Maternal plasma
    b) Cord serum
    c) Neonate plasma
    d) No crossmatch necessary
19. Indirect antiglobulin testing is used for:
    a) Detection of in vivo antibody coating of red cells
    b) Compatibility testing between recipient and donors
    c) Reverse ABO grouping of donors
    d) Typing Rh positive cells prior to transfusion
20. Which of the following statements accurately describes the difference between secretors and non-secretors in terms of blood group antigens?
    a) Secretors have the ability to secrete their blood group antigens into body fluids, whereas non-secretors do not.
    b) Non-secretors can secrete blood group antigens into body fluids, while secretors do not have this ability.
    c) Secretors and non-secretors refer to the presence or absence of specific enzymes involved in the synthesis of blood group antigens.

d) The secretor status does not affect the presence of blood group antigens in body fluids; it only relates to the antigen's expression on the red blood cells.

SECTION B: SHORT ANSWER ALL QUESTIONS (40 MARKS)

a. Distinguish between major and minor crossmatch and discuss single tube crossmatch technique [6 marks]

b. Outline blood group A subgroups and explain how you can differentiate them [5 marks]

c. With the aid of a diagram, discuss the synthesis of H and B antigens [6 marks]

d. Outline the clinical significance of ABO antibodies [6 marks]

e. Discuss factors that affect immunogenicity of a substance [6 marks]

f. Outline the contraindications of blood donation [5 marks]

g. Discuss the Rhesus antigen variants [6 marks]

SECTION C: LONG ANSWER TWO QUESTIONS (40 MARKS)

1. a. Discuss various types of blood transfusion reactions and the role of the laboratory in the investigation of blood transfusion reaction [20 marks]

b. Discuss the different mechanisms of pathogenesis of haemolytic of disease of the newborn, laboratory findings and the management interventions [20 marks]

c. Explain some of the blood products a components used in blood transfusion including their preparation, storage and indications for use [20 marks]