



Class: XI

Time Allowed: 20 minutes

Q1:

MODEL PAPER EXAMINATION 2025
SUBJECT: HEMATOLOGY & BLOOD BANKING
SECTION "A"

Marks: 17

Note: Attempt **ALL** questions from this section. Each question carries **ONE** mark.

1. Which of the following wbc's have round shape nucleus?
 A. Eosinophils B. basophils C. Lymphocytes D. Monocytes
2. What is the purpose of cross matching in blood transfusions?
 A. To determine blood type B. To identify infectious agents C. To prevent hemolysis reactions D. To assess platelet function
3. Which types of white blood cells increase in allergic reaction?
 A. Monocytes B. Basophils C. Eosinophil D. Neutrophils
4. What is the main precursor molecule for hemoglobin synthesis?
 A. Bilirubin B. Heme C. Porphyrin D. Globin
5. Platelets are typically stored at what temperature to maintain their viability?
 A. 2-8°C B. 37°C C. -20°C D. 18-24°C
6. Which blood component is primarily transfused during a standard blood transfusion?
 A. Red blood cells B. platelets C. plasma D. white blood cells
7. A person with blood type A Rh-positive can receive blood from donors with blood types:
 A. A Rh-positive and O Rh-negative B. A Rh-negative and B Rh-positive
 C. AB Rh-positive and O Rh-positive D. B Rh-positive and AB Rh-negative
8. Which of the following WBCs have orange red granules?
 A. Lymphocytes B. Eosinophils C. Basophils D. Neutrophils
9. At which stage of Rbcs, nucleus is out from the cell?
 A. Proerythroblast stage B. Reticulocytes C. Polychromatic stage D. Orthochromatic stage
10. Which definition is most accurate for anemia?
 A. Low hb level B. decrease red blood cells with low hemoglobin
 C. Decrease red blood cell D. low plasma volume
11. What is the primary component of red marrow responsible for blood cell formation?
 A. Osteocytes B. adipocytes C. Hematopoietic cells D. collagen fibers
12. Microcytic anemia is caused by?
 A. Folic acid deficiency B. Alcohol C. Blood loss D. Iron deficiency
13. Which Plasmodium species is responsible for the most severe form of malaria in humans?
 A. Plasmodium vivax B. Plasmodium falciparum C. Plasmodium ovale D. Plasmodium malariae
14. What distinguishes reticulocytes from mature red blood cells when viewed under a microscope?
 A. Size B. Bluish tinge color C. Presence of ribosomal RNA D. All of the above
15. In complete blood count, portion of Red blood cells in whole blood is known as?
 A. Packed cell volume B. Plasma C. Buffy coat D. Platelets
16. What is the normal range of total white blood cell count in adults?
 A. 4,000 to 10,000 cells/mm³ B. 20,000 to 25,000 cells/mm³ C. 10,000 to 15,000 cells/mm³ D. 15,000 to 20,000 cells/mm³
17. Which abnormal hemoglobin results from a point mutation leading to the substitution of valine for glutamic acid in the β-globin chain?
 A. Hemoglobin A1 B. Hemoglobin A2 C. Hemoglobin F D. Hemoglobin S

Time Allowed: 30 minutes

Practical Based Assessment (PBA)

Marks: 15

18. Neubauer chamber central region contain which alphabetic shape?
 A. H shape B shape C. Y shape D. W shape
19. Polychromatic defines increase of which cells in blood?
 A. Rbcs B. Wbcs C. Platelets D. Reticulocytes
20. In blood film, blood smear should be made in which of the following shape?
 A. Round shape B. Oval shape C. Thumb shape D. Hexagonal shape
21. Which of the following wbc's has heart shape nucleus?
 A. Eosinophils B. Neutrophils C. Basophils D. Monocytes
22. Which of the following blood cells, are derive from Megakaryocytes?
 A. Platelets B. White blood cells C. RBCs D. Plasma cells
23. Platelets are seen in microscope as?
 A. Star shape B. Moon shape C. Dumbel shape D. Rod shape

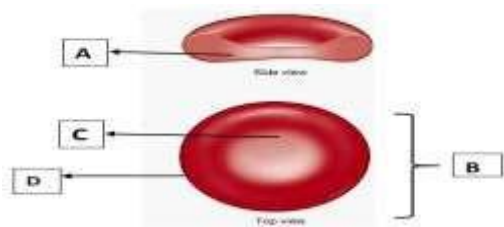
24. Label the Rbcs

A. Shape

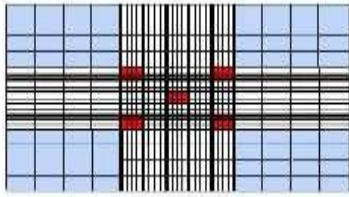
B. Size

C. Contain

D. Color



25. In neubar chamber, Wbcs are count in which of the following boxes?



A. Corner boxes W1, W2, W3, W4

B. Center box

C. Middle box

D. Side boxes

26. Which of the following best defines the physiological process of hemostasis?

- A. The continuous circulation of blood through the systemic and pulmonary circuits.
- B. The localized sequence of events that stops bleeding from a damaged blood vessel.
- C. The process of producing new red blood cells in the bone marrow.
- D. The breakdown and removal of a blood clot after tissue healing.

27. Which coagulation factor is converted into a solid mesh to form the structural foundation of a blood clot?

- A. Factor II (Prothrombin)
- B. Factor I (Fibrinogen)
- C. Factor VIII (Antihemophilic factor)
- D. Factor X (Stuart-Prower factor)

28. A 62-year-old patient presents with sudden onset fatigue and easily bruising. A bone marrow aspirate reveals a rapid accumulation of cells consisting of 35% immature myeloblasts containing distinct "Auer rods."

How should this leukemia be classified?

- A. Acute Lymphoblastic Leukemia (ALL)
- B. Chronic Myeloid Leukemia (CML)
- C. Acute Myeloid Leukemia (AML)
- D. Chronic Lymphocytic Leukemia (CLL)

29. A pediatric oncologist is evaluating a 4-year-old patient who has just been diagnosed with Acute Lymphoblastic Leukemia (ALL). During the patient's history review, the physician notes a pre-existing congenital condition that drastically increases the lifetime risk of developing childhood leukemia.

Which of the following genetic factors is the most likely underlying etiology?

- A. An inherited mutation in the BRCA1 gene
- B. An extra copy of chromosome 21 (Down syndrome)
- C. A germline deletion of the p53 tumor suppressor gene
- D. A congenital deficiency in Vitamin B12 absorption

30. A patient requires two units of packed red blood cells for surgery. The technician mixes the patient's (recipient) serum with a suspension of the donor's red blood cells to check for agglutination.

What is this procedure and its primary purpose?

- A. Major Crossmatch to detect recipient antibodies
- B. Minor Crossmatch to detect donor antibodies
- C. Direct Antiglobulin Test to detect coated donor cells
- D. Indirect Antiglobulin Test to screen for antigens

31. A trauma patient needs a transfusion of packed red blood cells (PRBCs) preserved in CPDA-1.

What is the correct storage temperature and maximum shelf life for this unit?

- A. 1°C to 6°C for up to 35 days
- B. -18°C or colder for up to 1 year
- C. 20°C to 24°C for up to 5 days
- D. 1°C to 6°C for up to 120 days

32. A donor's blood shows no visible agglutination with Anti-D reagent on an initial rapid slide test.

What is the next mandatory laboratory step before officially labeling this donor unit as Rh-negative?

- A. Perform a weak D (Du) test using the tube method and AHG.
- B. Label the unit as confirmed Rh-negative immediately.
- C. Perform a reverse ABO grouping using the tube method.
- D. Wash the red cells and repeat the rapid slide test.

END OF SECTION A

Class: XI

MODEL PAPER EXAMINATION 2025

Time: 2 hours 40 minutes SUBJECT: H&B BANKING SECTION "B" AND SECTION "C"

Total Marks 68

Q2: SECTION "B" SHORT ANSWER QUESTIONS

36 Marks

Note: Answer any NINE questions from this section. All questions carry equal marks.

- (i) How can bone marrow be examined through aspiration method?
- (ii) Why is Rh factor important? What is its significance?
- (iii) Explain the relationship of hematology with other branches of pathology.
- (iv) What are the causes of microcytic hypochromic anemia?
- (v) How is human blood collected aseptically?
- (vi) What is the difference between Rh-positive and Rh-negative?
- (vii) Write the composition of hemoglobin.
- (viii) How do people get infected with Leishmania parasites?
- (ix) Write any three symptoms of anemia.
- (x) How are ABO blood types determined?
- (xi) List down any four characteristics of Red Blood Cells.
- (xii) What is the clinical significance of osmotic fragility test?

SECTION "C" DETAILED ANSWER QUESTIONS

32 Marks

Note: Answer any TWO questions from this section. All questions carry equal marks.

- Q3:
 - a. Define Anemia and elucidate the classification of Anemia.
 - b. Draw and define the shapes of Rbcs target, Sickle, Spherocytes, Acanthocytes, Schizocytes?
- Q4:
 - a. What are the complications of blood transfusion?
 - b. Why do Rbcs have blue color in precursor cell that later change to red color?
- Q5:
 - a. Describe the life cycle of Plasmodium.
 - b. Why is blood storage important?

END OF PAPER