To be filled by the candidate) **Booklet S. No. _____**

Roll No. (In figures) _____

Roll No. (In words) _____

_____

Name of the Candidate : _____

Father's Name : _____

Center of Examination : _____

Total No. of Questions : 50

Paper Code-2621

Name of Examination- Senior Resident/Specialist Tutor Entrance 2026

Specialty-Immuno Hematology and Blood Transfusion

Time Allowed : 90 Minutes **Maximum Marks : 200**

IMPORTANT NOTE:

(i) OMR Answer Sheet will be supplied by the Examination Centre Superintendent for answering the questions.

(ii) Use **Blue/Black Ink/ Ball Pen only**, to darken the appropriate circle in the OMR Answer Sheet.

(iii) Darken one circle deeply for each question in the OMR Answer Sheet, as faintly darkened circle might be rejected by the Optical Scanner.

(iv) Darkening of more than one circle shall be rejected by the scanner. **Over-writing, cutting, erasing or use of White Fluid is not allowed.**

(v) Before dealing with the question paper, fill-up the required information with Blue/Black Ball Pen correctly both in the Question Booklet and in the OMR Answer Sheet.

(vi) Do not fold the OMR Answer Sheet nor put any mark here and there to avoid rejection by the Optical Scanner.

(vii) Write Roll. No. carefully on the OMR Answer Sheet and darken the appropriate circle properly.

(viii) **Each question carries Four Marks while 1 mark shall be deducted for each incorrect response.**

(ix) **Use of Calculator is not allowed.**

(x) **No over-writing, cutting, erasing or use of white fluid is allowed.**

(xi) Rough work be done on the sheet(s) at the end.

(xii) **MOBILE TELEPHONES (EVEN ON SWITCH-OFF MODE) AND SUCH OTHER ELECTRONIC DEVICES ARE NOT ALLOWED INSIDE THE EXAMINATION HALL.**

(xiii) The question paper-booklet will be retained by the candidate after the entrance test is over.

Q1. All of the following statements regarding a unit of packed red blood cells (PRBCs) are true **EXCEPT**:

a) PRBCs may contain residual leukocytes and platelets unless leukoreduced
b) PRBCs are used to improve oxygen-carrying capacity
c) PRBCs have a hematocrit of approximately 75%
d) PRBCs are prepared by removal of most plasma from whole blood

Answer: C. PRBCs have a hematocrit of approximately 75%

Q2. One unit/10 Kg of platelet concentrate raises platelets by

a) 17-50 $x10^9$/L
b) 5-10 $x10^9$/L
c) 11-15 $x10^9$/L
d) 7-14 $x10^9$/L

Answer: a

Q3. RBC storage lesion refers to all except

a) Structural
b) Biochemical
c) Metabolic changes
d) Viral Contamination

Answer: d

Q4. All of the following are true for Pheresis platelets except

a) Contain at least 3×10^{11} platelets
b) Vol is 300 ml as per AABB standards
c) Require further filtration
d) Equivalent to 3-6 whole blood-derived platelet concentrates

Answer: c

Q5. Which of the following is not a feature of good platelet viability

a) Have discoid morphology
b) Reflects light
c) Produces a "swirling" visual effect
d) Have a spherical shape

Answer: d

Q6. Constituents of PASs (Platelet additive solutions) are all except

a) Adenosine
b) Citrate, Acetate, and phosphate
c) Potassium and magnesium
d) Glucose

Answer: a

Q7. All of the following statements are true about selective leukoreduction filters except

a) Capable of at least a 3-log reduction of WBCs in blood components
b) These are synthetic filters
c) remove WBCs by a combination of mesh density, chemical attraction, and active adhesion
d) Following leukoreduction, all RBC units must have at least 5 × 106 WBCs/U

Answer : d

Q8. The recommended dose for the irradiation of blood and blood products is:

a) 2500 cGy at the center
b) 2750 cGy at the center
c) 2000 cGy at the center
d) 2700 cGy at the center

Answer: a

Q9. Complications of Hb-based oxygen carriers (HBOCs) include all except:

a) Hypertension
b) Renal injury
c) Pancreatic Injury
d) Stroke

Answer: d

Q10. All is true for TOTAL trial except

a) Children aged 6 to 60 months were included
b) Had Severe anemia owing to malaria or sickle cell disease
c) No reduction in rates of stupor or coma
d) Serum lactate levels decreased from 9.1 to ≤3 mmol/L 6 hours after RBC transfusion

Answer: c

Q11. Pseudoagglutination refers to all of the following **except:**

a) It may be caused by rouleaux formation
b) Dilution with dextrose abolishes the reaction
c) It can mimic true agglutination
d) Saline replacement helps differentiate it from true agglutination

Answer: B. Dilution with dextrose abolishes the reaction

Q12. Which of the following is not true about Autoagglutination

a) Refers to red cell agglutination by the patient's own serum or plasma
b) Indicates the presence of a warm agglutinin
c) Testing can be completed after washing the patient's red cells with warm saline
d) Indicates the presence of a cold agglutinin

Answer: b

Q13. In the presence of heart failure, the rate of transfusion should be

a) 1 mL/kg/h
b) 3 mL/kg/h
c) 5 mL/kg/h
d) 7.5 mL/kg/h

Answer: a

Q14. All of the following are prerequisites of platelet transfusion except:

a) Administered within 6 hours once the blood bag is opened
b) Infused over 30 minutes
c) Platelets should be examined for abnormal appearance before they are transfused.
d) Administered through a filter(170- or 260-µm filter)

Answer: a

Q15. All are required for CCI(Corrected count increment) for platelets except:

a) Pretransfusion count and posttransfusion count
b) Body surface area (m2)
c) Number of platelets administered
d) Volume of infusion

Answer: d

Q16. All of the following statements regarding **immediate hemolytic transfusion reaction (IHTR)** are true **EXCEPT**:

a) It is most commonly caused by ABO incompatibility
b) It is mediated by IgM antibodies
c) Anti-A and Anti-B antibodies are incapable of activating complement
d) It can lead to intravascular hemolysis

Answer: C **Anti-A and Anti-B antibodies are incapable of activating complement**

Q17. False about DHTRs is

a) Red cell destruction is predominantly extravascular
b) The transfused red cells are destroyed between 2 and 10 days after a transfusion
c) The direct antiglobulin test is often positive

d) Anti-Kell and Anti-Duffy (Fy) antibodies are implicated in most cases of DHTR

Answer :d

Q18. Conditions associated with pseudohemolytic transfusion reactions

a) Contamination with Yersinia
b) Resorption of large hematomas
c) Hemolysis caused by drug reactions or vascular prostheses
d) All of the above

Answer: d

Q19. All of the following cause FNHTR except:

a) Platelet-specific antibodies
b) Granulocyte-specific antibodies
c) Cytokines developed during storage
d) RBC antibodies

Answer: d

Q20. All of the following are diagnostic features of **transfusion-related acute lung injury (TRALI) EXCEPT**:

a) Acute onset of respiratory distress within 6 hours of transfusion
b) PaO_2/FiO_2 ratio greater than 300 mmHg
c) Bilateral pulmonary infiltrates on chest imaging
d) Absence of circulatory overload

Answer: B. PaO_2/FiO_2 ratio greater than 300 mmHg

Q21. False regarding Post-transfusion purpura is

a) Develops 5 to 10 days after transfusion
b) Caused by the development of autoantibodies directed against platelet-specific antigens
c) Anti–HPA-1a is often implicated
d) Corticosteroids or plasma exchange are ineffective in management

Answer: b

Q22. All the statements are correct for Transfusion-related immunomodulation (TRIM) except:

a) Beneficial transfusion-related immunomodulatory effects in renal transplant patients
b) Benefits Women with recurrent spontaneous abortions
c) Benefits patients with Crohn's disease
d) Reduces cancer recurrence

Answer: d

Q23. Which of the following patient groups are at High Risk for Transfusion-Associated Graft-Versus-Host Disease

a) Congenital immunodeficiencies
b) Solid-organ transplant recipients
c) Preterm infants
d) Newborns receiving exchange transfusion

Answer: a

Q24. All is true about transfusion-associated circulatory overload except:

a) Onset within 6 hours of transfusion
b) Left heart failure
c) Pulmonary edema
d) Normal brain natriuretic peptide

Answer: d

Q25. All the following arthropod-borne infections can be transmitted through transfusions except:

a) West Nile Virus
b) T. cruzi
c) ZIKV
d) None of the above

Answer: d

Q26. Which of the following Pathogen Reduction Technologies is used for Transfusable plasma (individual units)

a) Solvent/detergent treatment
b) Riboflavin (vitamin B2) + UV light
c) Frangible nucleic acid crosslinker
d) UV light only

Answer: b

Q27. Which of the following Pathogen Reduction Technologies is not used for Transfusable platelets

a) Psoralen + UV light
b) Riboflavin (vitamin B2) + UV light
c) Methylene blue + light
d) UV light

Answer: c

Q28. A 65-year-old woman with acute myeloid leukemia is undergoing induction chemotherapy. She is requiring both red blood cell (RBC) and platelet transfusion support. The patient has persistently low platelet counts (platelet 3000/microL) despite twice a day platelet transfusion. Which of the following is an appropriate next step?

a. Order a 1-hour post-platelet count after each subsequent platelet transfusion
b. Order crossmatched platelets.
c. Order HLA-selected platelets.
d. Request that the patient's daughter donate apheresis platelets for their mother (directed-donor platelets)

Answer:a

Q29. A 25-year-old patient with sickle cell disease is admitted with an acute pain crisis. She is treated with hydration, opioids for pain control, and was transfused 2 units of red blood cell (RBC) for hemoglobin (Hgb) of 6.5 g/dL. She is group B+ with a history of an anti-Fya alloantibody. Transfused RBCs were B+, matched for Rh, K, Fy(a) antigens (negative for C, E, K, Fya), and crossmatch-compatible by the indirect antiglobulin test (IAT). Her hemoglobin rose to 8.5 g/dL posttransfusion but then abruptly decreased (Hgb=5 gm/dL) 3 days later with worsening hemolysis. Which of the following actions is contraindicated in this clinical setting?

a) Order a direct antiglobulin test (DAT, direct Coombs) and repeat type and screen.
b) Order a reticulocyte count and hemoglobin electrophoresis.
c) Administer steroids.
d) Order emergency transfusion of 2 units, ABO/Rh-compatible RBC to correct her anemia

Answer: d

Q30. Which of the following blood products should be irradiated?

a. Red blood cells (RBCs) for a kidney transplant recipient
b. RBC for a sickle cell patient
c. HLA-matched platelets for a cardiac surgery patient
d. Plasma for an aplastic anemia patient

Answer: c

Q31. A 25-year-old, group A, Rh-negative male presented with petechiae and nosebleeds approximately 4 weeks after infection with Covid-19. His complete blood count (CBC) showed a normal white blood cell (WBC) count, hemoglobin, low platelets (5000/microL), and markedly elevated reticulated platelets (% immature platelet fraction [IPF] = 30%). He was subsequently diagnosed with acute idiopathic thrombocytopenia purpura [ITP] and treated with steroids and high-dose intravenous immunoglobulin (IVIG; 2 gm/kg over 2 days). On hospital day 4, he required 2 units of group AB apheresis platelets for a severe nosebleed. On hospital day 5, his laboratories showed a decrease in hemoglobin (Hgb 14 → 11 gm/dL), haptoglobin <10 gm/dL, indirect bilirubin of 11 gm/dL, and positive DAT (immunoglobulin G [IgG] = 3+, C3 = 2+). What is the most likely cause of hemolysis in this patient?

a. Platelet transfusion
b. High-dose IVIG
c. Disseminated intravascular coagulation (DIC)
d. Steroid-induced hypertension

Answer: b

Q32. A 40-year-old group O, cytomegalovirus (CMV)-negative man with acute myeloid leukemia (AML) is admitted for a haploidentical, related stem cell transplant. His transplant course has been complicated by delayed engraftment with prolonged pancytopenia and Aspergillus pneumonia. The transplant team has requested granulocyte transfusions. Which of the following is NOT true regarding granulocyte transfusion in this patient?

a) The donor must be ABO/Rh-compatible and the granulocyte product must be crossmatched with the patient.
b) The granulocyte donor may be either CMV-negative or CMV-positive.
c) Granulocytes must be irradiated.
d) Granulocytes are stored at room temperature and must be infused within 24 hours of collection.

Answer: b

Q33. A 45-year-old man with confusion, microangiopathic hemolytic anemia, and low ADAMTS13 activity (<5%) was admitted for thrombotic thrombocytopenia purpura (TTP) and therapeutic plasma exchange. During his second procedure, he developed nausea and complained that his legs felt “funny and numb.” What is the most logical next step in managing the patient?

a. Administer intravenous (IV) fluids for hypovolemia.
b. Order a brain MRI for a possible stroke.

c. Pause the procedure and administer calcium.
d. Reassure the patient that his symptoms are due to TTP and will resolve with time

Answer: c

Q34. Which of the following is false

a) Daratumumab is an anti-CD38 monoclonal antibody
b) Daratumumab interferes with RBC agglutination
c) Daratumumab-treated patients should receive blood from K antigen-positive individuals
d) Daratumumab is used to treat Multiple myeloma

Answer: c

Q35. Which of the following is paired incorrectly

a) HNA1-Neutrophils and basophils
b) HNA2-Neutrophils
c) HNA3-Neutrophils
d) HNA4-CD11b

Answer: c

Q36. A 68-year-old man is admitted to the intensive care unit with spontaneous retroperitoneal bleed ing and hypotension. He has a medical history of hypertension, diabetes mellitus, and chronic kidney disease stage III. His medications include lisinopril, amlodipine, sitagliptin, and glimepiride. On initial presentation, he is in pain and has a blood pressure of 70/40 mm Hg with a heart rate of 132 beats/ min. His hemoglobin on admission is 5.3 g/dL and hematocrit is 16.0%. His coagulation studies demonstrate an aPTT of 64 seconds and a PT of 12.1 seconds (INR 1.0). Mixing studies (1:1) are performed. Immediately, the aPTT decreases to 42 seconds. At 1 hour, the aPTT is 56 seconds, and at 2 hours, it is 68 seconds. Thrombin time and reptilase time are normal. Fibrinogen is also nor mal. What is the most likely cause of the patient's coagulopathy?

a) Acquired factor VIII deficiency
b) Acquired factor VIII inhibitor
c) Heparin
d) Lupus anticoagulant

Answer: b

Q37. A 62-year-old man is evaluated for anemia. He has a hemoglobin of 9.0 g/dL (normal hemoglobin value, 15 g/dL), hematocrit of 27.0% (normal hemato crit, 45%), mean cell volume of 88 fL, mean cell hemoglobin of 28 pg, and mean cell hemoglobin concentration of 30%. On peripheral blood smear, polychromatophilic macrocytes are seen. The retic ulocyte count is 9%. What is the reticulocyte pro duction index?

a) 0.54
b) 1.67
c) 2.7
d) 4.5

Answer : c

Q38. Patients from which of the following regions need not be screened for glucose-6-phosphate dehydro genase (G6PD) deficiency when starting a drug that carries a risk for G6PD-mediated hemolysis?

a) Brazil
b) Russia
c) Southeast Asia
d) Southern Europe

Answer : b

Q39. The triad of portal vein thrombosis, hemolysis, and pancytopenia suggests which of the following diagnoses?

a) Acute promyelocytic leukemia
b) Thrombotic thrombocytopenic purpura (TTP)
c) Leptospirosis
d) Paroxysmal nocturnal hemoglobinuria (PNH)

Answer: d

Q40. All of the following laboratory values are consistent with an intravascular hemolytic anemia EXCEPT:

a) Increased haptoglobin
b) Increased lactate dehydrogenase (LDH)
c) Increased reticulocyte count
d) Increased unconjugated bilirubin

Answer: a

Q41. A 34-year-old woman with a medical history of sickle cell anemia presents with a 5-day history of fatigue, lethargy, and shortness of breath. She denies chest pain and bone pain. She has had no recent travel. Of note, the patient's 4-year-old daughter had a "cold" 2 weeks before the presentation. On examination, the woman has pale conjunctiva, is anicteric, and is mildly tachycardic. Abdominal examination is unre markable. Laboratory studies show a hemoglobin of 3 g/dL; her baseline is 8 g/dL. The white blood cell count and platelets are normal. Reticulocyte count is undetectable. Total bilirubin is 1.4 mg/dL. Lactic dehydrogenase is at the upper limits of the normal range. Peripheral blood smear shows a few sickled cells but a total absence of reticulocytes. The patient is given a transfusion of 2 units of packed red blood cells and admitted to the hospital. A bone marrow biopsy shows a normal myeloid series but an absence of erythroid precursors. Cytogenetics are normal. What is the most appropriate next management step?

a) Make arrangements for exchange transfusion.
b) Tissue type her siblings for a possible bone marrow transplant.
c) Check parvovirus titers.
d) Start prednisone and cyclosporine.

Answer: c

Q42. A 48-year-old woman is evaluated by her primary care physician for a complaint of gingival bleed ing and easy bruising. She has noted the problem for about 2 months. Initially, she attributed it to aspirin that she was taking intermittently for head aches, but she stopped all aspirin and nonsteroidal anti-inflammatory drug use 6 weeks ago. Her only medical history is an automobile accident 12 years previously that caused a liver laceration. It required surgical repair, and she did receive several transfu sions of red blood cells and platelets at that time. She currently takes no prescribed medications

and otherwise feels well. On physical examination, she appears well and healthy. She has no jaundice or scleral icterus. Her cardiac and pulmonary exami nation results are normal. The abdominal examina tion shows a liver span of 12 cm to percussion, and the edge is palpable 1.5 cm below the right costal margin. The spleen tip is not palpable. There are petechiae present on her extremities and hard pal ate with a few small ecchymoses on her extremities. A complete blood count shows a hemoglobin of 12.5 g/dL, hematocrit of 37.6%, white blood cell count of 8400/μL with a normal differential, and a platelet count of 7500/μL. What tests are indicated for the workup of this patient's thrombocytopenia?

a) Antiplatelet antibodies
b) Bone marrow biopsy
c) Hepatitis C antibody and Human immunodeficiency antibody
d) All of the above

Answer: c

Q43. Which of the following statements regarding hemophilia A and B is TRUE?

a) Individuals with factor VIII deficiency have a more severe clinical course than those with factor IX deficiency.
b) Levels of factor VIII or IX need to be measured before administration of replacement therapy in pa tients presenting with acute bleeding to calculate the appropriate dose of factor.
c) Primary prophylaxis against bleeding is never indicated.
d) The goal level of factor VIII or IX is >50% in the set ting of large-volume bleeding episodes

Answer : d

Q44. A 31-year-old man with hemophilia A is admitted with persistent gross hematuria. He denies recent trauma and any history of genitourinary pathology. The examination is unremarkable. Hematocrit is 28%. All the following are treatments for hemophilia A EXCEPT:

a) Desmopressin (DDAVP)
b) Cryoprecipitate
c) Recombinant factor VIII
d) Plasmapheresis

Answer : d

Q45. All the following cause prolongation of the activated partial thromboplastin time that does not correct with a 1:1 mixture with pooled plasma EXCEPT:

a) Lupus anticoagulant
b) Factor VIII inhibitor
c) Heparin
d) Factor VII inhibitor

Answer: d

Q46. All of the following genetic mutations are associ ated with an increased risk of deep-vein thrombosis EXCEPT:

a) Factor V Leiden mutation
b) Glycoprotein 1b platelet receptor
c) Heterozygous protein C deficiency
d) Prothrombin 20210G

Answer: b

Q47. All of the anticoagulant or antiplatelet drugs listed are correctly matched with their mechanisms of action EXCEPT:

a) Abciximab—Glycoprotein IIb/IIIa receptor inhibitor
b) Clopidogrel—Adenosine diphosphate receptor blockade
c) Enoxaparin—Direct thrombin inhibition
d) Rivaroxaban—Factor Xa inhibition

Answer: c

Q48. A 36-year-old African American woman with sys temic lupus erythematosus presents with the acute onset of lethargy and jaundice. On initial evalua tion, she is tachycardic and hypotensive, appears pale, is dyspneic, and is somewhat difficult to arouse. Physical examination reveals splenomegaly. Her initial hemoglobin is 6 g/dL, white blood cell count is 6300/μL, and platelets are 294,000/μL. Her total bilirubin is 4 g/dL, reticulocyte count is 18%, and haptoglobin is not detectable. Renal function is normal, as is urinalysis. What would you expect on her peripheral blood smear?

a) Macrocytosis and polymorphonuclear leukocytes with hypersegmented nuclei
b) Microspherocytes
c) Schistocytes
d) Sickle cells

Answer: b

Q49. A 23-year-old man presents with diffuse bruising. He otherwise feels well. He takes no medications, does not use dietary supplements and does not use illicit drugs. His medical history is negative for any prior illnesses. He is a college student and works as a barista in a coffee shop. A blood count reveals an absolute neutrophil count of 780/μL, hemato crit of 18%, and platelet count of 21,000/μL. Bone marrow biopsy reveals hypocellularity with a fatty marrow. Chromosome studies of peripheral blood and bone marrow cells are performed that exclude Fanconi's anemia and myelodysplastic syndrome. The patient has a fully histocompatible brother. Which of the following is the best therapy?

a) Antithymocyte globulin plus cyclosporine
b) Red blood cell and platelet transfusion
c) Growth factors
d) Hematopoietic stem cell transplant

Answer: d

Q50. Which of the following statements regarding polycythaemia vera is correct?

a) An elevated plasma erythropoietin level excludes the diagnosis.
b) Transformation to acute leukemia is common.
c) Thrombocytosis correlates strongly with thrombotic risk.
d) Aspirin should be prescribed to all of these patients to reduce thrombotic risk

Answer: a

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