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OPSC
Asst. Prof.
Previous Year Paper
(Transfusion Medicine)
17 Nov, 2024





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T.B.C. : APB-21-23/24

Sl. No. **2805**

Test Booklet Series

TEST BOOKLET

**ASSISTANT PROFESSOR (BROAD SPECIALTY)
(TRANSFUSION MEDICINE)**

A

K-21

Time Allowed : 3 Hrs.

Maximum Marks : 200

INSTRUCTIONS TO CANDIDATES

1. IMMEDIATELY AFTER COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET OF SAME SERIES ISSUED TO YOU.
2. ENCODE CLEARLY THE TEST BOOKLET SERIES **A, B, C** OR **D**, AS THE CASE MAY BE, IN THE APPROPRIATE PLACE IN THE ANSWER SHEET USING BALL POINT PEN (BLUE OR BLACK).
3. You have to enter your **Roll No.** on the Test Booklet in the Box provided along side. **DO NOT** write *anything else* on the Test Booklet.
4. **YOU ARE REQUIRED TO FILL UP & DARKEN ROLL NO., TEST BOOKLET / QUESTION BOOKLET SERIES IN THE ANSWER SHEET AS WELL AS FILL UP TEST BOOKLET / QUESTION BOOKLET SERIES AND SERIAL NO. AND ANSWER SHEET SERIAL NO. IN THE ATTENDANCE SHEET CAREFULLY. WRONGLY FILLED UP ANSWER SHEETS ARE LIABLE FOR REJECTION AT THE RISK OF THE CANDIDATE.**
5. This Test Booklet contains **200** items (questions). Each item (question) comprises four responses (answers). You have to select the correct response (answer) which you want to mark (darken) on the Answer Sheet. In case, you feel that there is more than one correct response (answer), you should mark (darken) the response (answer) which you consider the best. In any case, choose **ONLY ONE** response (answer) for each item (question).
6. You have to mark (darken) all your responses **ONLY** on the **separate Answer Sheet** provided, by using **BALL POINT PEN (BLUE OR BLACK)**. See instructions in the Answer Sheet.
7. All items (questions) carry equal marks. All items (questions) are compulsory. Your total marks will depend only on the number of correct responses (answers) marked by you in the Answer Sheet. There shall be negative marking for wrong answers. For each wrong answer, 0.25 marks shall be deducted from the marks awarded for correct answers.
8. Before you proceed to mark (darken) in the Answer Sheet the responses to various items (questions) in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per instructions sent to you with your **Admission Certificate**.
9. After you have completed filling in all your responses on the Answer Sheet and after conclusion of the examination, you should hand over to the Invigilator the *Answer Sheet* issued to you. You are allowed to take with you the candidate's copy / second page of the Answer Sheet along with the **Test Booklet**, after completion of the examination, for your reference.
10. Sheets for rough work are appended in the Test Booklet at the end.

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1. A 23-year-old female is a known case of sickle cell anemia. She came to antenatal clinic in second trimester. She is worried about her sickle cell disease along with pregnancy. She wants to know the treatment options available. Which of the following is the best suited treatment option available during her current pregnancy in context of sickle cell anemia management?
 - (A) Hydroxyurea
 - (B) RBC transfusion
 - (C) Termination of pregnancy
 - (D) Bone Marrow transplant

2. Which of the following is the feature thought to be responsible for severity of HDFN due to RhD IgG?
 - (A) Type of heavy chain in IgG
 - (B) Avidity of IgG
 - (C) Degree of fucosylation of IgG
 - (D) Sedimentation coefficient of IgG

3. Kleihauer-Betke test is a qualitative test that reveals the presence of Rh positive fetal cells in maternal circulation and is used in deciding the dose of Rh immunoglobulin to be given to mother to prevent hemolytic disease of fetus and newborn. Which of the following may confound Kleihauer-Betke test?
 - (A) Hereditary persistence of fetal hemoglobin
 - (B) B thalassemia trait
 - (C) Sickle cell hemoglobin
 - (D) Hemoglobin E

4. One 300 mcg of RhIg provides protection for how much volume of fetal RBC in milliliter (ml) in circulation?
 - (A) 5 ml
 - (B) 15 ml
 - (C) 30 ml
 - (D) 40 ml

5. Which of the following weak D variant is a candidate of Rh Ig prophylaxis?
 - (A) Type 1
 - (B) Type 2
 - (C) Type 3
 - (D) Type 4

6. A 11-year-old came to emergency with a snake bite in left thigh while she was working in field. Four hours had passed already when she came. There is no active bleeding. The kidney function tests are normal. The coagulation tests showed raised PT, APTT, TT. Fibrinogen was not detectable. What is the NEXT line of treatment?
 - (A) Cryoprecipitate
 - (B) FFP
 - (C) Anti-snake venom with cryoprecipitate
 - (D) Anti-snake venom

7. The physician ordered a von Willebrand panel. The results are as following: von Willebrand factor (vWF): 120%, Ristocetin Cofactor: 40%, and the von Willebrand multimer study shows loss of high molecular multimer. A ristocetin-induced platelet aggregation demonstrates aggregation with both high and low dose ristocetin. What is the most likely diagnosis?
 - (A) Type 1 von Willebrand disease
 - (B) Type 2A von Willebrand disease
 - (C) Type 2B von Willebrand disease
 - (D) Type 2N von Willebrand disease

8. What is the reason that in factor VIII deficiency, the bleeding takes place even when the extrinsic coagulation pathway is still intact?
- The level of factor VIIa is low that cannot stop bleeding.
 - Extrinsic pathway is represented by propagation phase; hence initiation of clotting does not occur.
 - Extrinsic pathway is represented by initiation phase which is inhibited by Tissue Factor Pathway Inhibitor.
 - Activated Factor VIIa interferes with factor IXa activity in absence of Factor VIII.
9. A blood sample was taken from a healthy donor in sodium citrate tube. He was not on any medication. Sample was drawn by a Newly appointed phlebotomist in blood bank. The sample was sent immediately to hematology laboratory. Both PT and APTT values were prolonged (16.5 seconds and 45 seconds respectively). Clinical condition could not explain the test results. What could be reason/reasons for these findings?
- The tourniquet applied was for > 1 minute, while drawing sample.
 - 2.7 ml sample was taken in 3 ml tube that already had 0.3 ml anticoagulant.
 - Sample was taken in syringe and then transferred in vacutainer.
 - The vacutainer tube was overfilled.
10. A patient arrived for coagulation test of PT and APTT. He had just taken breakfast. You have a coagulation machine working on principle of detection of clot by photo-optical method. What should be done in this case NEXT?
- Ask him to come fasting next day and will refuse to take sample.
 - Ask him to come after 3 hours to give sample.
 - Take sample and run on machine.
 - Ask him to come 30 minutes after lunch.
11. In phlebotomy area, vacutainers containing 3.8% sodium citrate were available. The phlebotomist took sample of blood. Which of the following statement is true related to the results of PT and APTT?
- The results will be not affected as vacutainer has sodium citrate
 - There will be false high values of PT and APTT
 - There will be false low values of PT and APTT
 - We can run both ESR and PT, APTT with same vacutainer, hence saving the cost
12. A one-month old infant was brought to pediatric OPD with umbilical stump infection and bleeding. Mother had history of three miscarriages in I and II trimester of pregnancy. The coagulation workup showed normal PT, APTT, Fibrinogen, TT, platelets number. Which of the following is correct?
- Factor XIII deficiency
 - Von Willebrand Disease
 - Factor X deficiency
 - Factor XII deficiency

13. Which of the following statement is true about a good, sensitive PT reagent?
- Depends on the content of phospholipid
 - Picks up the mildest of deficiency and exaggerates the difference between ranges of deficiency
 - PT reagent misses deficiency and will not show the difference between ranges of deficiency
 - Depends on sodium azide concentration
14. Granulopoiesis (or granulocytopenia) is a part of haematopoiesis, that leads to the production of granulocytes. Regarding granulopoiesis, which is a true statement?
- Secondary granules are seen only at the band and mature granulocyte stage
 - Blasts, promyelocytes and myelocytes all have nucleoli
 - Granulopoiesis in a normal marrow is seen adjacent to bone
 - Metamyelocytes are capable of cell division
15. In a number of clinical circumstances, it would be desirable to artificially conceal cellular antigenic determinants to permit survival of heterologous donor cells. Chemical modification of the red blood cell (RBC) membrane might serve to occlude antigenic determinants, thereby minimizing transfusion reactions. This is termed as "Camouflage" antigen. It is caused by
- PEG treatment of RBC
 - α -N-acetylgalactosaminidase enzyme treatment of RBC
 - α -galactosidase enzyme treatment of RBC
 - Low pH treatment of RBC
16. An enzyme, extracted from green-roasted coffee beans (*Coffea canephora*), can be used to produce universal red blood cells (RBC). By using this enzyme, which of the following blood group can be converted to universal RBC?
- A
 - B
 - AB
 - A, B and AB
17. Which of the following play a key role in platelet leucocyte interaction?
- P selectin
 - 5-HT
 - ADP
 - Glycoproteins
18. Soluble CD 40 Ligand (SCD40L), a content of α granule is associated with which of the following function of platelets?
- Platelet aggregation
 - Wound repair
 - Coagulation
 - Inflammation
19. Thrombospondin -1, a content of α granules is associated with which of the following function of the platelets?
- Platelet aggregation
 - Wound repair
 - Coagulation
 - Inflammation
20. Loss of which of the following glycoprotein is associated as a marker of platelet activation?
- GPIb
 - GPIIb
 - GPIIIa
 - GPIX

21. Platelet microparticles (PMPs) are submicron membrane-bound vesicles that are shed during platelet activation, stress, and integrin mediated destabilization of the actin cytoskeleton. Which of the following is the closest concentration of platelet microparticles in a platelet concentrate?
- (A) 500/ μ l
 (B) 5000/ μ l
 (C) 50000/ μ l
 (D) 500000/ μ l
22. Preparation and storage-induced Platelet microparticles (PMPs) amplify thrombosis via aggregation, coagulation, and fibrinolysis processes. Storage induced platelet microparticles are also associated with immunomodulatory effect. Which of these effects of PMP is associated with kidney transplant?
- (A) Increased survival of renal allograft and increased chances of post-operative infection
 (B) Decreased survival of renal allograft and Decreased chances of post-operative infection
 (C) Increased survival of renal allograft and Decreased chances of post-operative infection
 (D) Decreased survival of renal allograft and increased chances of post-operative infection
23. Which of the following can be used as treatment of Hyperhemolysis syndrome?
- (A) Lanadelumab
 (B) Eculizumab
 (C) Infliximab
 (D) Adalimumab
24. The demand of platelet product is increasing day by day. There is growing research in field of ex-vivo production of blood cells like red blood cells, platelets and hematopoietic stem cells. Which of the following is the result of ex-vivo platelet production?
- (A) Good platelet yield
 (B) Low platelet yield
 (C) Platelet yield is good but in vivo function is not good
 (D) Platelet yield is low but in vivo function is good
25. Platelets are formed from the megakaryocytes that develop from Hematopoietic Stem Cells (HSC). There is documented role of shear stress in platelet formation. What is the importance of shear stress in platelet production in vivo?
- (A) Lead to development of megakaryocyte from HSC
 (B) Lead to expansion of HSC
 (C) Lead to expansion of megakaryocyte
 (D) Lead to release of platelets in circulation
26. What is the approximate number of platelets produced from one megakaryocyte in vivo and in vitro respectively?
- (A) 200 and 30
 (B) 100 and 60
 (C) 30 and 200
 (D) 60 and 100

27. A famous red cell storage duration study (RECESS) study was done to evaluate the red cell concentrate stored for ≤ 10 days or 21 days transfused in cardiac surgery patients. Which of the following primary outcome was measured in this study?
- Multiple organ dysfunction score
 - Disseminated intravascular coagulation score
 - Hemoglobin increment
 - Red cell hemolysis
28. Which of the following red cell storage lesion product is associated with increased bacterial growth?
- Platelet white cell aggregates
 - Non transferrin bound iron
 - Macrovesicles
 - Bioactive lipid
29. Which of the following is the main cause of anemia in ICU patients?
- Anemia of inflammation
 - Iron deficiency anemia
 - Anemia of renal failure
 - Megaloblastic anemia
30. A red blood cell (RBC) has a life span of approximately 120 days. The daily production of red blood cell in term of number and volume have also been studied. What is the average daily RBC production in 70 kg adult?
- 10.5 ml
 - 17.5 ml
 - 25.5 ml
 - 31.5 ml
31. What is the common cause of functional iron deficiency in ICU patients?
- reduce bioavailable iron through hepcidin
 - reduce iron adsorption through gut
 - reduce release of iron from ferritin pool
 - reduce iron storage
32. Anemia development in a hospitalized patient is multifactorial. A hospitalized patient is also treated with drugs. These drugs also lead to development of anemia in these patients. Which of the following is NOT a cause of drug induced anemia?
- Immune hemolytic anemia
 - Megaloblastic
 - Sideroblastic
 - Iron deficiency
33. The concept of patient blood management is not only to use blood component rationally but also there to use alternatives of blood components wherever possible. Which of the following is correct about post-operative iron therapy?
- This was ineffective in raising hemoglobin level
 - This was not safe
 - Systematic review support use of post-operative iron therapy
 - This therapy was not tolerated
34. Protein C is a Vitamin K dependent anticoagulant. Its role in coagulation cascade is very important. However, it also has another role in human body along with anticoagulation. Which of the following is an additional role of protein C?
- Cytoprotection
 - Infection prevention
 - Immunity
 - Cancer prevention
35. Which of the following statement is correct in reference to secondary granules of neutrophils?
- Contain lactoferrin
 - Are also known as azurophilic granules
 - Contain peroxidase
 - Are found in immature granulocytic cells

36. When compared to normal adult CBC values, normal values for neonates and children differ considerably with the exception of:
- RBC count
 - WBC count
 - Platelet count
 - Hemoglobin level
37. In human, platelet production occurs at many sites. Which of the following is NOT a site of platelet production?
- Bone Marrow
 - Blood Stream
 - Lung
 - Liver
38. Hemoglobin measurement by spectrophotometric method may be falsely elevated or reduced by some factors. Causes of falsely elevated hemoglobin levels by the spectrophotometric method include all of the following EXCEPT:
- Leukocytosis
 - Paraproteinemia
 - Hyperlipidemia
 - Thrombocytosis
39. Cold antibody affects the hematological parameters including red cell indices. Therefore, one indication for warming the blood and repeating the CBC test is elevated:
- Hemoglobin
 - Hct
 - MCH
 - MCHC
40. The total number of white blood cells counted in complete blood counting is called uncorrected WBC count. When the uncorrected WBC count is higher than the corrected WBC count, the most likely cause is:
- Presence of nucleated RBCs
 - Presence of large platelets
 - High lymphocyte count
 - Presence of paraproteinemia
41. Regarding the zeta potential of red cells, which of the following is/are true statement/s?
- The zeta potential of red cells is the negative charge around red cells that prevent them from aggregating
 - Red cells do not have zeta potential
 - Agents that increase the zeta potential will result in decreased ESR
 - EDTA increases the zeta potential of red cells
- (i), (iii), (iv)
 - (i), (iv)
 - (i), (iii)
 - (ii)
42. An individual has microcytic hypochromic anemia (mild) with the presence of target cells on the peripheral smear. Hemoglobin electrophoresis demonstrates HbA₂ (6%), HbF (3%) and HbA (91%). Iron studies are unremarkable. Patient has never received any blood transfusion. The most likely diagnosis is:
- α thalassemia trait
 - β thalassemia trait
 - β thalassemia intermedia
 - β thalassemia major

43. A Greek individual undergoes hemoglobin electrophoresis for mild anemia. Results show normal HbA₂ at 3.3%, HbF at 10% and the remaining hemoglobin is HbA. A possible diagnosis is:
- β thalassemia trait
 - β thalassemia major
 - $\delta\beta$ thalassemia, heterozygous state
 - δ thalassemia
44. A known individual with sickle cell disease undergoes red cell exchange. Post electrophoresis hemoglobin shows HbA 80%, HbS 12%, HbF 4% and HbC 4%. The most likely explanation for the presence of HbC is:
- Spontaneous new mutation
 - Patient does not actual has sickle cell disease
 - One of the RBCs that was used for transfusion was from a HbAC (C trait) donor
 - Carryover from the previous sample that was tested
45. The thromboelastogram (TEG) is a viscoelastic test that characterizes the strength and formation of a clot over time. Which of the following is a true statement?
- Clotting factor deficiency would cause a shortening of the R time
 - During hyperfibrinolysis, the LY30 would decrease
 - Thrombocytopenia would result in an elevated MA
 - During hyperfibrinolysis, the k and α angle would decrease
46. What is the formula for the international normalized ratio?
- $(PT \text{ measured} / PT \text{ mean})^{ISI}$
 - $(PT \text{ measured} - PT \text{ mean} / PT \text{ mean})^{ISI}$
 - $(PT \text{ mean} / PT \text{ measured})^{ISI}$
 - $(PT \text{ mean} - PT \text{ measured} / PT \text{ measured})^{ISI}$
47. What is the gold standard for diagnosis of Heparin Induced Thrombocytopenia (HIT)?
- Ultrasound demonstration of thrombosis after heparin use
 - Serotonin release assay
 - Heparin/ PF4 ELISA
 - Heparin-induced platelet aggregation
48. There are thirteen coagulation factors that participate in coagulation pathway. The half-life of different coagulation factors are different. Which factor has the shortest plasma half- life?
- Factor IX
 - Factor XI
 - Factor VII
 - Factor I
49. Which of the following is the minimum area required to start whole blood and apheresis facility in a hospital?
- 150 sq. meter
 - 110 sq. meter
 - 160 sq. meter
 - 20 sq. meter

50. In blood center, there is joint inspection from the central licensing authority as well as state licensing authority. State Drugs Controllers are authorized to issue licenses for blood banks, as per separate enactment in Drug & cosmetic rules 1967 in Schedule F of part ____
 (A) X B
 (B) XII C
 (C) X A
 (D) XII B
51. According to drug and cosmetic act, all collected blood must be tested for HIV, Hepatitis B & C, malaria and syphilis. The blood center must discard all reactive units as per the defined protocol, however, a blood center was found to issue contaminated blood. What will the punishment for this offence?
 (A) Imprisonment not less than 1 year to 3 years and fine not less than Rs.5000
 (B) Imprisonment not less than 5 years to term and fine not less than Rs.10000
 (C) Imprisonment not less than 1 year to 2 years and fine not less than Rs.1000
 (D) Imprisonment not less than 1 year to 2 years and fine not less than Rs.10000
52. NABH (National Accreditation Board for Hospitals & Healthcare Providers) is a constituent board of Quality Council of India, set up to establish and operate accreditation programme for healthcare organizations. Which of the following is NOT a quality indicator of blood bank as per NABH standard?
 (A) Adverse transfusion reaction rate
 (B) Wastage rates
 (C) Adverse donor reaction rate
 (D) Component QC passing rate
53. A medical director of a blood center applied for license of convalescent plasma collection. There was inspection of drug inspectors for the same. What is the terminology used for this process?
 (A) Proficiency testing
 (B) Internal audit
 (C) External inspection
 (D) Continual improvement
54. Which of the following time frame is associated with comparatively less decrease in pH in regard of storage of platelets in blood center?
 (A) First day
 (B) Second day
 (C) Third day
 (D) Fourth day
55. In order to maintain sufficient pH, what is the minimum quantity of plasma required in platelet concentrates?
 (A) 35 ml
 (B) 45 ml
 (C) 55 ml
 (D) 65 ml
56. What is the direct role of acetate in platelet additive solution?
 (A) Better energy production
 (B) Better pH maintains
 (C) Better platelet recovery as compared to plasma
 (D) Better platelet function
57. Which of the following is the first step found after activation of platelet in platelet concentrate?
 (A) Becomes rounded or sphere
 (B) Loss of discoid shape
 (C) Finger like projection
 (D) Flattens over the surface

58. ThromboSol/2% DMSO is term that can be used as a synonym with
- Lyophilized platelets
 - Frozen platelets
 - Cold-stored liquid platelets
 - Infusible platelet membranes
59. RBC storage lesions are defined as: biochemical and morphological changes that occur with increasing storage time. Which of the following correctly describes RBC storage lesion?
- Decrease intracellular pH
 - Increase intracellular calcium
 - Increase intracellular potassium
 - Increase nitrosylation of hemoglobin
60. Patients should be informed of the known risks and benefits of blood transfusion and/or alternative therapies and have the right to accept or refuse the procedure. This is primarily written in
- Hemovigilance program of India
 - ISBT code of Ethics
 - National Blood Policy
 - Drug and Cosmetics act
61. A 61-year-old man comes to the emergency department with worsening fatigue and maroon-colored stools for the past day. On examination his blood pressure is 80/40 mm Hg. His oxygen saturation is 50%. His Hct is 17%. His electronic medical record documents his blood type from testing last year as type A positive. Which of the following orders for packed red blood cells is most appropriate for this man?
- Type and screen for type A positive cells
 - Type and cross for type A positive cells
 - Emergent release of type A positive cells
 - Emergent release of type O negative cells
62. An ABO discrepancy between forward and reverse grouping owing to weak-reacting or missing antibodies could be best explained by which of the following:
- Patient has a subgroup of blood group A
 - Patient is very old or very young
 - Patient has acquired B phenotype
 - Patient has antibodies to low incidence antigens
63. Immune A and B alloantibodies differ from non-red cell stimulated (naturally occurring) A and B alloantibodies in that the immune antibodies
- Are generally IgG rather than IgM
 - Are unable to cross the placenta
 - Can be enhanced in reactivity by incubation at 4°C
 - Cause direct agglutination at room temperature
64. Which ABH substances would you expect to find in the saliva of a group A secretor?
- A only
 - H only
 - H and A
 - H and O
65. A 47-year-old woman complains of heavy menstrual bleeding for up to 2-week duration for each of the past five cycles. She also reports that she has a tendency to bruise easily, and has several episodes of epistaxis over the past couple of months. Blood analysis shows: hemoglobin 8 g/dL; hematocrit 24%; MCV 70 fL; platelet count 2,30,000/ μ L. Which of the following is a likely cause of her bleeding disorder?
- Hemophilia
 - Nonsteroidal anti-inflammatory drugs
 - Vitamin B12 deficiency
 - Von Willebrand disease

66. The parents of a child are concerned because the pediatrician noted the child was "yellow" and ordered some studies. They produce a wad of papers for you to review. Both the mother and baby have O-positive blood. The baby's direct serum bilirubin is 0.25 mg/dL, with a total serum bilirubin of 11.9 mg/dL. Urine bilirubin is positive. The infant's white blood cell count is 13,000/ μ L with a differential of 50% polymorphonuclear cells, 45% lymphocytes, and 5% monocytes. The hemoglobin is 17 g/dL, and the platelet count is 2,78,000/ μ L. Reticulocyte count is 1.5%. The peripheral smear does not show fragments or abnormal cell shapes. Which of the following is the most likely explanation for this infant's skin color?
- (A) Rh or ABO hemolytic disease
 (B) Physiologic jaundice
 (C) Sepsis
 (D) Congenital spherocytic anemia
67. All samples should be treated as potentially infectious. The rules that govern these are currently referred to as:
- (A) Universal precautions
 (B) Standard precautions
 (C) Laboratory safety rules
 (D) Safety rules
68. Blood donors (X) and (Y) are having the enzyme which adds galactose & N-acetylgalactosamine respectively to the end of glycolipids which determine the blood group. The blood groups of (X) and (Y) respectively are:
- (A) O and B
 (B) O and A
 (C) B and A
 (D) A and B
69. If a patient had a positive Direct Antiglobulin Test (DAT) with Anti-IgG, what would happen if you performed a Weak D test on the patient cells?
- (A) A false-positive result
 (B) A false-negative result
 (C) An indeterminate result
 (D) A valid test result
70. A hematologist informs you that a severe Factor XIII deficient patient is moving to your area and that you should make preparations to have appropriate components in inventory for the prophylaxis that he requires. You should anticipate that this patient will require which of the following?
- (A) Frozen plasma monthly
 (B) Frozen plasma weekly
 (C) Cryoprecipitate monthly
 (D) Cryoprecipitate weekly
71. A 17-year-old boy having DCe/DCe phenotype has undergone repeat transfusions as he suffers from thalassemia. He receives a compatible red cell transfusion, but develops jaundice, mild fever and high colored urine during 48 hours of post-transfusion. The post-transfusion sample shows positive IAT. His DAT is positive, LDH 700 units and un-conjugated bilirubin is 4.3 mg/dl. The most common implicated antibody may be:
- (A) Anti-C
 (B) Anti-E
 (C) Anti-G
 (D) Antibodies other than Rh system

72. An antenatal woman with 27 weeks first pregnancy has reported reduced fetal movement. On ultrasound the fetus is found to have intracranial haemorrhage. There is no history of predisposition to increased bleeding in the mother or father and maternal platelet count is normal. What could be the most likely cause of Intracranial haemorrhage in the fetus?
- (A) Hemophilia A
 (B) Hemophilia B
 (C) Von Willebrand Disease
 (D) Neonatal alloimmune thrombocytopenia
73. Red cells of a blood donor on RhD typing with one monoclonal anti D reagent tests as RhD positive and with another monoclonal anti D reagent his cells type as RhD negative. What is the most likely cause of this discrepancy?
- (A) Partial D
 (B) Rh D positive
 (C) Rh null
 (D) Rh mod
74. If a patient who is R1R1 is transfused with RBCs that are R^or, which antibody is he most likely to produce?
- (A) Anti-D
 (B) Anti-C
 (C) Anti-E
 (D) Anti-G
75. At what point(s) in gestation is RhIG to be administered in a normal pregnancy per AABB and ACOG recommendations?
- (A) 20 weeks gestation and at time of delivery
 (B) 28 weeks gestation and at time of delivery
 (C) Time of delivery within 72 hours only
 (D) 28 weeks gestation only
76. Which of the following red cell systems are present on Chromosome 1?
- (A) Scianna, Knops, MNS, Kidd
 (B) Rh, Duffy, Cromer, Knops
 (C) Rh, Cromer, Duffy, Lewis
 (D) Scianna, Cromer, MNS, Lewis
77. What is recommended WBC count/unit for prevention of febrile reaction in a RBC unit as per Drug and Cosmetic act?
- (A) 5×10^6 /unit
 (B) 5×10^7 /unit
 (C) 5×10^8 /unit
 (D) 5×10^9 /unit
78. Potency of any reagent is measured by-
- (A) Titer that is the highest dilution at which macroscopic agglutination is seen as 1+.
 (B) Titer that is the highest dilution at which macroscopic agglutination is seen as 2+.
 (C) Titer that is the lowest dilution at which macroscopic agglutination is seen as 1+.
 (D) Titer that is the lowest dilution at which macroscopic agglutination is seen as 2+.
79. What is the minimum number of platelets required in an apheresis component as per drug and cosmetic act?
- (A) 5.5×10^{11}
 (B) 3×10^{10}
 (C) 3×10^{11}
 (D) 5.5×10^{10}

80. Leukoreduction (3-4 log) by the prestorage in-line filters has the following advantage:
- Reduced cost
 - Can prevent FNHTR
 - Procedure is easy
 - Less time is required
81. Which of the following technique would you suggest that is simple to perform, cost effective and reasonably accurate for process control of leuco- reduced components?
- Polymerase chain reaction
 - Flowcytometry
 - Cytospin method
 - Nageotte chamber
82. All blood banks should follow a quality management system. Which of the following option is correct regarding QA and QC?
- QC is an integral part of QA
 - QA is an integral part of QC
 - QA and QC are independent of each other
 - QC may or may not depend on QA
83. A 30-year-old female, G4P3, with a previously uncomplicated obstetric history, has a detectable anti-C with a titre of 4, at her booking appointment. Which of the following measures is/are appropriate in the subsequent management of the patient?
- Repeat antibody titre at 28 weeks
 - Monitor antibody titre every 4 weeks until 28 weeks, and every 2 weeks subsequently until delivery
 - Regular MCA dopplers every 4 weeks until 28 weeks and 2 weeks subsequently until delivery
 - A direct antiglobulin test (DAT), hemoglobin, and bilirubin performed on mother's blood post delivery
84. What critical titers in general are used for anti-D and anti-KELL antibodies as a threshold to begin surveillance with serial middle cerebral artery peak systolic velocity (MCA PSV) Doppler ultrasound for HDN assessment?
- 8 and 64
 - 16 and 32
 - 16 and 8
 - 64 and 16
85. A 79-year-old woman complained of lethargy, passing dark tea colored urine for the last 3 days, gave a history of recent urinary infection and was treated with trimethoprim and cephadroxil. Her hemoglobin is 7.0 g/dl (reticulocytes of 9.4%), white cell and platelet counts are normal. Blood film shows polychromasia and moderate red cell agglutination. The dipstick urine test is negative for hemoglobin. Bilirubin is 29 mmol/l. CD59 protein is detected on 100% red cells by flow cytometry. Bone marrow aspirate reveals prominent erythropoiesis. Direct antiglobulin test is strongly (4+) positive with anti-C3d, and weakly positive (1+) with anti-IgG. The negative control (patient's red cells + buffer) gives a weak positive reaction. What is the likely diagnosis in this case?
- Cold agglutinin disease
 - Drug-induced immune hemolytic anemia
 - Glucose - 6 - dehydrogenase deficiency
 - Paroxysmal Nocturnal Hemoglobinuria (PNH)

86. A previously transfused patient has had her first test request for ABO/Rh typing and antibody detection at your facility. The initial antibody detection and identification assays were reactive with all untreated and ficin-treated reagent red blood cells with antihuman globulin (AHG) only, with an equal strength of reaction and having a mixed field appearance by tube method. The patient's autologous control was nonreactive. Additional testing was performed with dithiothreitol (DTT) and trypsin-treated reagent red blood cells, with all cells nonreactive at all phases of testing. Molecular sequencing reveals that at the chromosome location of 19q13.32, there is homozygous expression of guanine at nucleotide position 230 in exon 3. What is the most likely antibody identification?
- (A) Anti-Lu^b
 (B) Anti-K
 (C) Anti-Sd^a
 (D) Anti-Cr^a
87. A 25-year-old woman has a 3-year history of arthralgia. Physical examination shows no joint deformity, but she appears pale. Laboratory studies show total RBC count of 4.7 million/mm³, hemoglobin of 12.5 g/dL, hematocrit of 37.1%, platelet count of 217,000/mm³, and WBC count of 5890/mm³. The peripheral blood smear shows hypochromic and microcytic RBCs. Total serum iron and ferritin levels are normal. Hemoglobin electrophoresis shows an elevated hemoglobin A2 level of about 5.8%. What is the most likely diagnosis?
- (A) Autoimmune hemolytic anemia
 (B) β-Thalassemia minor
 (C) Infection with plasmodium falciparum
 (D) Anemia of chronic disease
88. Immunological immunoassay situations in which antibody and antigen are in excess respectively are:
- (A) Postzone and Prozone
 (B) Prozone and Prozone
 (C) Prozone and Postzone
 (D) Postzone and Postzone
89. Which of the following is the main immunoglobulin in the gut and secretions (saliva, milk, tears) and is important in mucosal immunity?
- (A) IgA
 (B) IgD
 (C) IgE
 (D) IgG
90. A patient presents with symptoms suggestive of autoimmune hemolytic anemia. A direct Coombs test is positive. Which of the following is a correct interpretation of the test?
- (A) The patient has autoantibodies in her serum that are directed against her own red blood cells.
 (B) The patient has anti-Ig antibodies in her serum.
 (C) The patient's red blood cells have autoantibodies bound to the surfaces.
 (D) The patient has complement-fixing autoantibodies bound to her red blood cells.
91. Which of the following red blood cell antigens shows increased expression following incubation with proteolytic enzymes?
- (A) Duffy antigens
 (B) MN antigens
 (C) Kidd antigens
 (D) Kell antigens

92. Ulex Europeus agglutinates O cells and other ABO blood groups depending on the amount of H antigen available. Which cells agglutinate most strongly with Ulex Europeus lectin in decreasing order
 (A) A2 > O > B > A2B > A1 > A1B
 (B) O > A2 > B > A2B > A1 > A1B
 (C) A2 > A2B > O > B > A1 > A1B
 (D) O > A2 > A2B > B > A1B > A1
93. There is a new born delivered from a 25 years old mother at 38 weeks of her gestation in your institution. Which of the following red cell antigens is fully and strongly expressed on red blood cells of this new born?
 (A) I antigen
 (B) K antigen
 (C) A antigen
 (D) Le(a) antigen
94. You are working on a specimen in the laboratory that you believe to be a Bombay phenotype. Which of the following reactions would you expect to see?
 (A) Patient's cells + Ulex Europeus = no agglutination
 (B) Patient's cells + Ulex Europeus = agglutination
 (C) Patient's serum + group O donor RBCs = no agglutination
 (D) Patient's serum + A1 and B cells = no agglutination
95. An anaemic patient showed pan reactivity while doing Cantibody screen and identification. All tested cells are positive (3+) at the AHG phase of reactivity. The autocontrol is also positive (3+) at the AHG phase. The patient has not been transfused or pregnant in the preceding 6 months. Which technique would you use to complete the case?
 (A) Cold allo-adsorption
 (B) Cold autoadsorption
 (C) Warm allo-adsorption
 (D) Warm autoadsorption
96. When performing antigen typing using a reagent that requires the antiglobulin test, the positive control fails to yield a positive result. Which of the following is the most likely explanation for this result?
 (A) Failure to add the patient's plasma
 (B) Incubation at 35 °C
 (C) Failure to add enhancement reagent
 (D) Using a cell with homozygous antigen expression
97. Which of the blood group antigens can be missed out on routine antibody screening while being clinically significant as can cause HDN and HTR?
 (A) Xg
 (B) Miltenberger (Mia)
 (C) Lutheran (Lu)
 (D) INRA(In)
98. The INDIAN (023) blood group system currently consists of 4 antigens, namely, In (a), In (b), In3, and In4. Of these, In (a) occurs in a low frequency of about 3% in Indians. Antibodies to INDIAN blood group antigens result in direct agglutination of red blood cells (RBCs) in saline medium but react stronger by the indirect antiglobulin test (IAT). The antigens of the system are sensitive to:
 (A) Papain and 2-aminoethyl isothiuronium bromide (AET)
 (B) Dithiothreitol (DTT)
 (C) Polyethylene glycol (PEG) and AET
 (D) LISS and DTT
99. The Indian blood group system (In) is a classification of blood based on the presence or absence of inherited antigens that reside within which CD molecule expressed on the surface of blood cells:
 (A) CD44
 (B) CD26
 (C) CD02
 (D) CD56

100. Which of the following blood components does not need to be crossmatched with a patient's sample?
- Granulocyte product collected by apheresis
 - Apheresis Platelet product containing 3ml of red cells
 - Pooled platelet product containing 1.5ml of red cells
 - Leucocyte reduced red blood cells
101. After performing quality control of monoclonal anti-A antisera, it was found that it did not fulfill the quality control criteria. The minimum titer of monoclonal anti-A antisera with A₁ cells is
- 1:32
 - 1:64
 - 1:128
 - 1:256
102. RhD and RhCE proteins and RhAG are exclusively on red blood cells. As they are transmembrane, it is not surprising they play a role in maintaining the structural integrity of red blood cells. Which of the following statements is true regarding Rh_{null} and Rh-associated glycoprotein (RhAG)?
- RhAG is located on chromosome 1 in close approximation to the Rh genes.
 - The Rh_{null} phenotype most commonly results from mutations in the RhAG gene.
 - Cold agglutinins will typically bind to all red cells except those of the rare Rh_{null} phenotype.
 - Rh_{null} red cells are acanthocytic and are associated with severe hemolytic anemia.
103. Which of the following represents an appropriate use of the direct antiglobulin test (DAT)?
- Reverse typing a patient to determine the ABO type
 - Performing an antibody screen
 - Performing a crossmatch
 - Detecting bound immunoglobulins in a patient with drug induced hemolysis.
104. The enzyme responsible for conferring H-activity on the red cell membrane is:
- D-galactosyltransferase
 - UDP- glucuronyltransferase
 - L-fucosyltransferase
 - Glycosyltransferase
105. Which of the following statements about enhancement media and potentiator is correct?
- Albumin enhances antibody uptake by reducing the net negative charge of the red cell.
 - PEG enhances agglutination by decreasing the negative charge (zeta potential) around red cells.
 - LISS enhances antibody uptake by reducing the zeta potential and allows increased attraction between positively charged antibodies and negatively charged red cells.
 - Enzyme treatment enhances antibody uptake by decreasing the net negative charge of the red cell by removing sialic acid residues.

106. Sulfhydryl reagents cleave disulphide bonds and can lead to the weakening or removal of sensitive antigens on red blood cells. Which of the following is sulfhydryl reagent?
- Ficin
 - α -chymotrypsin
 - 2-mercaptoethanol
 - Pronase
107. The P antigen is a receptor for
- Shiga toxin
 - Streptococcus suis
 - Candida albicans
 - Parvovirus B19
108. As a characteristic feature of Cold Hemagglutinin disease auto agglutination of anticoagulated whole blood samples quickly as the blood cools to room temperature. What measure can you take to perform prevent error due to agglutination.
- Pre warming
 - Enzyme treatment
 - Saline replacement
 - Elution
109. A 15-year-old male patient is brought in emergency department in hemolytic crisis. The patient is a known case of G 6 PD deficiency. Which of the following could initiate a hemolytic crisis in the patient?
- Kidney beans
 - Cucumber seeds
 - Sunflower seeds
 - Fava beans
110. The word "innocent bystander" hemolytic anemia associated with Drug induced AIHA means
- Mechanical destruction of compatible transfused cells
 - Immune Destruction of incompatible transfused cells
 - Immune Destruction of autologous red cells
 - Mechanical destruction of autologous red cells
111. The AABB maintain requirements for allogeneic donor qualification by their Standards for Blood Banks and Transfusion Services. What is the maximum volume allowed per whole blood donation event per donor as per these standards?
- 10.5 mL per kilogram of donor weight, excluding samples.
 - 10.5 mL per kilogram of donor weight, including samples.
 - 12.5 mL per kilogram of donor weight, excluding samples.
 - 12.5 mL per kilogram of donor weight, including samples.
112. A diabetic donor who has normal control of his blood sugar at present wants to donate whole blood in a Voluntary blood donation camp. On further enquiry about the disease, he elaborated that he had visited reputed endocrinologist 5 weeks back where dose adjustment was done keeping the same oral hypoglycaemic drug. What should be the suitability for donation in this case?
- He should be accepted for donation.
 - He should be temporarily deferred for 14 days.
 - He should be temporarily deferred for 28 days.
 - He should be permanently deferred.

- 113.** Recipient and Donor Haemovigilance software which is an important tool for improving safe blood transfusion practices were launched in India by National Institute of Biologicals, Ministry of Health and Family Welfare on which dates respectively:
- (A) 1st October 2012 & 14th June 2015
 - (B) 14th June 2012 & 1st October 2015
 - (C) 12th December 2012 & 14th June 2015
 - (D) 14th June 2012 & 12th December 2015
- 114.** A regular voluntary repeat blood donor had undergone peripheral stem cell harvest for a patient suffering from haematological malignancy. Just after the procedure, he was curious to know his eligibility for next whole blood donation. According to Drug & Cosmetic Act 2020, after how many months he can donate whole blood?
- (A) 1 month
 - (B) 3 months
 - (C) 6 months
 - (D) 12 months
- 115.** A differently abled 30-year-old male donor who fully understands the donation process and can give a valid consent comes for whole blood donation in blood centre where you are posted as medical officer. As a medical officer you should:
- (A) Defer the donor temporarily
 - (B) Defer the donor permanently
 - (C) Accept the donor
 - (D) Accept the donor with high risk consent
- 116.** How much grams of air dried crystals of copper sulphate should be added to 500 ml distilled water at 25°C in order to make a stock solution?
- (A) 39.907 gm
 - (B) 79.815 gm
 - (C) 159.63 gm
 - (D) 319.26 gm
- 117.** A 30-year-old male donor undergoing plateletpheresis suddenly complains of perioral numbness and tightness around jaw. What is the most likely adverse reaction in the above donor?
- (A) Allergic reaction
 - (B) Citrate toxicity
 - (C) Respiratory distress
 - (D) Vasovagal reaction
- 118.** To prevent clot formation in the apheresis circuit, anticoagulation is required. One of the most common anticoagulants used is citrate. What is its mechanism of action to prevent clot formation?
- (A) Binds antithrombin and potentiates its activity
 - (B) Direct thrombin inhibitor
 - (C) Vitamin K antagonist
 - (D) Reduces ionized calcium
- 119.** To reduce the risk of hypovolemia secondary to performing an apheresis procedure, the general consensus is to limit what percent of the total extracorporeal blood volume relative to the total blood volume?
- (A) 35%
 - (B) 25%
 - (C) 15%
 - (D) 5%

120. A 45-year-old female loses 15% of her blood volume as a result of an accidental arterial laceration during a hysterectomy. The most appropriate immediate therapy is:
- Crystalloids
 - Colloids
 - FFP and packed red cells
 - Whole blood
121. A 25-year-old male involved in a road traffic accident was brought to the emergency room with a blood pressure of 60 mm Hg. He was transfused with 4 units of O Rh-negative whole blood and 4 L of normal saline solution. After the patient was brought to the operating room his blood type was determined to be A positive. Which of the following is the MOST APPROPRIATE blood type for further intraoperative transfusions?
- Type A, Rh-positive whole blood
 - Type A, Rh-positive RBCs
 - Type O, Rh-positive whole blood
 - Type O, Rh-negative RBC
122. SAGM Red cells are stored in refrigerators for up to 42 days. The criteria used to determine how long blood can be stored before transfusion is
- 90% of transfused erythrocytes must remain in circulation for 24 hours
 - 70% of transfused erythrocytes must remain in circulation for 24 hours
 - 70% of transfused erythrocytes must remain in circulation for 72 hours
 - 75% of transfused erythrocytes must remain in circulation for 7 days
123. Platelet transfusion thresholds varies for different surgeries and invasive procedures. Which of the following is correct regarding platelet threshold as per AABB guidelines?
- Prophylactic without bleeding: 20,000/ μ L
 - Massive transfusion/ Invasive surgery: 50,000/ μ L
 - Neurosurgery/ posterior eye surgery: 80,000/ μ L
 - Spinal anaesthesia: 30,000/ μ L
124. A fresh frozen plasma unit was accidentally kept outside the deep freezer for few hours. The level of which set of the following coagulation factors is likely to fall early to the maximum extent?
- II & V
 - V & VII
 - IX & XIII
 - VII & X
125. The lab technician has thawed 4 units of Fresh Frozen Plasma (FFP) for a trauma patient who died even after attempts at resuscitation and could not be transfused. These FFPs were sent back immediately to the blood banks in 10 minutes. What should be the suitability for the use of these FFPs?
- To be discarded.
 - Can be stored for 24 hours at Room temperature.
 - Can be stored for 24 hours at 4°C.
 - Can be stored for 1 year in deep freezer.

- 126.** A unit of RBCs is issued at 9:00 am. At 9:35 am, the unit is returned to the Blood Bank. The port of unit was not opened and unit was refrigerated at 1-6 degrees celsius during this time span. The best course of action for the technician is to:
- (A) Culture the unit for bacterial contamination
 - (B) Discard the unit if not used within 24 hours
 - (C) Store the unit at room temperature
 - (D) Record the return and place the unit back into inventory.
- 127.** Which of the following is the best strategy to minimize the chances of graft-versus-host reaction?
- (A) Leukoreduction
 - (B) Washing of red cells
 - (C) Pathogen Inactivation
 - (D) Irradiation
- 128.** A 33-year-old man with symptoms of a tightness in the chest, short of breath, develops a dry cough immediately following transfusion of one unit of blood component and Chest X-rays taken 2 hours after onset of symptoms showed "bat's wing" pattern of edema with sparing of the lung bases. This adverse reaction is most likely to occur under which of the following circumstances?
- (A) RBC transfusion from Nulliparous female donor
 - (B) FFP transfusion from Nulliparous female donor
 - (C) RBC transfusion from Multiparous female donor
 - (D) FFP transfusion from Multiparous female donor
- 129.** Which of the following patients would benefit the most from preoperative autologous donation?
- (A) Patient preparing for coronary artery bypass who has anti-Jk(a)
 - (B) Patient preparing for surgery after a motor vehicle accident
 - (C) Patient preparing for knee replacement surgery who has anti-k
 - (D) Patient preparing for inguinal hernia repair surgery who has anti-E
- 130.** The method which provides fresh autologous blood, in which the function of platelet and clotting factors are rarely affected and few red blood cells are lost. The method is:
- (A) Leap-frog technique
 - (B) Acute Normovolemic Haemodilution
 - (C) Intra-operative autotransfusion
 - (D) Post-operative autotransfusion
- 131.** What American Society for Apheresis (ASFA) category is homozygous FH as an indication for LDL apheresis?
- (A) Category I
 - (B) Category II
 - (C) Category III
 - (D) Category IV

132. A 70-year-old man with a past medical history of Waldenstrom macroglobulinemia (WM) was seen at the emergency department for blurry vision and headaches that started 1 day ago. Physical exam was remarkable for horizontal nystagmus. A serum viscosity assay performed at admission was 6 centipoise (CP, normal value 1.5 CP) and IgM level of 5.8 g/dL (high). Therapeutic plasma exchange (TPE) is requested for symptoms concerning for hyperviscosity. What is the best course of treatment for this patient?
- (A) Begin chemotherapy treatment; if symptoms do not improve, proceed with TPE.
 (B) Perform emergent TPE to remove IgM and improve hyperviscosity related symptoms.
 (C) Recommend infusion of normal saline to decrease serum viscosity.
 (D) Perform emergent leukocytapheresis to remove antibody-producing B cells in the blood.
133. What is the maximum blood unit irradiation dose limit that should not exceed in any circumstance?
- (A) 30 Gy
 (B) 40 Gy
 (C) 50 Gy
 (D) 60 Gy
134. Which of the following product modifications is most commonly selected for patients with a known history of severe allergic transfusion reactions?
- (A) Irradiation
 (B) Washing
 (C) Leukocyte reduction
 (D) Pathogen inactivation
135. Which of the following is the main regulator of human platelet production?
- (A) Erythropoietin
 (B) Thrombin
 (C) Thrombopoietin
 (D) Thrombomodulin
136. Which of the following is the most frequently identified somatic mutation seen in Polycythemia vera?
- (A) JAK2 p.V617F
 (B) t(9;22) BCR-ABL1
 (C) t(16;16) CBFβ-MYH11
 (D) t(15;17) PML-RARA
137. If a patient with AIDS is known to have donated previously, recipients of blood or blood components from these donations should be traced and notified. This process is known as:
- (A) Look back of recipient
 (B) Quarantine of blood donations
 (C) Surveillance of recipient
 (D) Notification of blood donation
138. A young boy of 20 years of age came to donate whole blood. The donated unit was separated into blood components but the platelet concentrate was found to be bacterially contaminated. What is the method to prevent this contamination?
- (A) Soap Water cleaning of the arm
 (B) Store platelets at room temperature
 (C) Inject platelets with bactericidal drugs
 (D) Diversion of the first few ml of whole blood
139. A health worker sustained needle stick injury while working. Post exposure prophylaxis for HIV should be started within _____ Hrs.
- (A) 12
 (B) 24
 (C) 72
 (D) 9

140. In a laboratory of the blood bank there was a major blood spill by a health care worker. Which of the following should be his next action?
- Let spill flow till it has stop moving
 - Soak the area with absorbent material
 - Cover the spill with detergent
 - Use distilled water for wiping
141. While managing a patient of severe trauma with massive transfusion, your supervisor has informed to be vary of the lethal triad and manage the patient accordingly. Lethal triad of severe trauma consists of:
- Acidosis, hypothermia and coagulopathy
 - Alkalosis, hypothermia and coagulopathy
 - Acidosis, hypotension and coagulopathy
 - Acidosis, hypotension and hypothermia
142. As per the recent amendment of Drug and Cosmetic Rules (Second amendment) 2020, which of the following is true regarding Plasmapheresis?
- The total serum protein shall be 8 gm/dl before the first plasmapheresis procedure.
 - In repeated plasmapheresis, the total serum protein should be tested before the third procedure if done within four weeks and it shall be 6 gm/dl
 - The quantity of plasma separated from the blood of donor shall not exceed 1000 ml per sitting
 - None of the above
143. Drug and Cosmetic act was revised recently and some criteria regarding blood donor selection were also revised. Which of the following is the correct statement about the age criteria?
- A person of 64 years can donate whole blood
 - A person of 64 years can donate whole blood only if repeat blood donor
 - A person of 64 years can donate whole blood but not apheresis
 - A person of 64 years neither can donate whole blood nor apheresis
144. Which of the following is the most likely mechanism of action of the EDTA?
- Inhibit glycolysis within RBC's
 - Remove calcium by forming calcium salts
 - Inactivate thrombin in the plasma
 - Activate the extrinsic coagulation pathway
145. In a flow cytometer, what does light emit as side scatter (SSC) measure?
- Cell size
 - Cell granularity
 - Cell surface marker/fluorescence
 - Cell Content
146. A 45 year donor has a history of Zika virus infection. What is the deferral period in months following full recovery?
- 2
 - 3
 - 4
 - 6
147. Mr. TY has a history of malaria 8 months back which was treated with anti malarials. He is accepted for blood donation. This is based on Deferral period for _____ months following full recovery.
- 2
 - 3
 - 5
 - 6

- 148.** Indications for photopheresis include which of the following?
- (A) Treatment of Cardiac allograft rejection
 - (B) Cutaneous T-cell lymphoma
 - (C) Acute myeloid leukemia
 - (D) Hodgkin's lymphoma
- 149.** Recently the Central Government after consultation with the Drugs Technical Advisory Board had recently made the certain rules under the heading (BLOOD CENTRES/BLOOD COMPONENTS) and under sub-heading (ACCOMMODATION FOR A BLOOD CENTRES) in order to further amend the Drugs and Cosmetics Rules, 1945. Which of the following area was recently inserted in these rules?
- (A) Separate NAT lab
 - (B) Counselling area with adequate privacy
 - (C) Room for Irradiator
 - (D) Refreshment-cum-rest room (air conditioned)
- 150.** A person with which one of the following red cell phenotypes is expected to be resistant to *Plasmodium vivax* malaria?
- (A) Fy(a-b-) phenotype
 - (B) Rh_{null} phenotype
 - (C) McLeod phenotype
 - (D) Le(a-b-) phenotype
- 151.** The difference between FFP and PF24 is described by which of the following?
- (A) FFP must be frozen sooner after collection than PF24
 - (B) Only FFP can be converted to thawed plasma
 - (C) Only PF24 can be converted to thawed plasma
 - (D) PF24 is never frozen, but remains in a liquid state following collection
- 152.** The first Convalescent plasma trial to be completed and published was from:
- (A) Mayo clinic
 - (B) Oxford Institute
 - (C) China institute of epidemiology
 - (D) ICMR
- 153.** This first published Convalescent plasma trial is termed;
- (A) Solidarity Trial
 - (B) Expanded access protocol
 - (C) PLACID
 - (D) Global clinical trial
- 154.** The Convalescent plasma trial by ICMR is termed:
- (A) Solidarity Trial
 - (B) Expanded access protocol
 - (C) PLACID
 - (D) Global clinical trial
- 155.** S/CO Ratio is recommended in CDC guidelines for serological testing. It pertains to:
- (A) Standard to cut off
 - (B) Signal to cut off
 - (C) Standard to control OD
 - (D) Signal to cut off OD

156. The characteristic erythrocyte seen in a peripheral blood smear in WAIHA is a:

- (A) macrocyte
- (B) spherocyte
- (C) dacrocyte
- (D) elliptocyte

157. A patient who received a transfusion 6 days ago is suspected of having a delayed transfusion reaction. Which of the following would not be a characteristic finding?

- (A) positive DAT
- (B) positive IAT
- (C) hemoglobinuria
- (D) decreased hemoglobin

158. Technical staff in component lab prepare random donor platelet (RDP) concentrate by PRP method, you are the resident doctor and observe some RDP unit contain lot of minute physically visible platelet aggregates. Your advice to resolve these aggregates for some extent will be _____.

- (A) Vigorous shaking of platelet product to dissolve platelet aggregates
- (B) Immediately transfer product to platelet agitator cum incubator
- (C) Use of BT-set filter to filter out platelet aggregate
- (D) Kept on flat surface undisturbed for 30 to 60 minutes

159. A 34-year-old woman is brought into the ER after falling off a ladder while painting her house. Selected lab results include:

Hemoglobin: 8.0 g/dL (80 g/L) PT: 36 seconds Hematocrit: 0.25 L/L (25%) APTT: >75 seconds Platelet count: $<20 \times 10^9$ Fibrinogen: 100 mg/dl Peripheral blood smear shows schistocytes. Given these results, what is the most likely diagnosis?

- (A) HELLP syndrome
- (B) TTP
- (C) DIC
- (D) Traumatic hemolytic anemia

160. What is the iron transport protein?

- (A) ferritin
- (B) transferrin
- (C) hemosiderin
- (D) albumin

161. Which of the following is the CORRECT formula for calculation of plasma volume?

- (A) Total blood volume \times (1-hematocrit)
- (B) Total blood volume \times (hematocrit-1)
- (C) (Total blood volume- 1) \times hematocrit
- (D) Total blood volume \times (1.5 - hematocrit)

162. Which of the following deferral criteria for plateletpheresis procedure is CORRECT?
- (A) Deferral after whole blood donation is 28 days for women
 - (B) Deferral after last dose of aspirin is 96 hours
 - (C) Minimum duration between two plateletpheresis procedure should be 72 hours
 - (D) Deferral after Covid-19 vaccination is 28 days for men
163. Which of the following can be given to an apheresis donor to increase the number of circulating granulocytes:
- (A) Desmopressin
 - (B) Hydroxy ethyl starch (HES)
 - (C) Immunoglobulin
 - (D) G-CSF
164. A patient with Hb value 3.5 g/dl is receiving Packed Red Blood Cells for transfusion. The instruction for maximum time for one unit to be transfused is :
- (A) 60 minutes
 - (B) 2 hours
 - (C) 3 hours
 - (D) 4 hours
165. A deficiency of which of the following coagulation factors would be associated with a prolonged partial thromboplastin time (PTT) without evidence for bleeding:
- (A) Factor - IX
 - (B) Factor - VIII
 - (C) Factor - XII
 - (D) Factor - X
166. Which of the following laboratory tests best distinguishes the coagulopathy of liver disease from DIC:
- (A) Prothrombin time
 - (B) Platelet count
 - (C) Partial thromboplastin time
 - (D) D Factor XIII assay
167. Which vacutainer tube is used in coagulation testing?
- (A) Heparin
 - (B) EDTA
 - (C) Sodium Citrate
 - (D) Sodium fluoride
168. As per drug and cosmetic act amendment 2020 the quality control requirement for FFP is that Factor VIII should be minimum _____
- (A) 80 IU/bag
 - (B) 70 IU/bag
 - (C) 90 IU/bag
 - (D) 110 IU/bag
169. A regular donor aged 38 yrs came voluntarily for blood donation. He is otherwise fit but received rabies vaccination 3 months back. As per drug and cosmetic act amendment 2020 what is the deferral for this situation?
- (A) 6 months from the date of vaccination
 - (B) 14 days from the date of vaccination
 - (C) 28 days from the date of vaccination
 - (D) 1 year from the date of vaccination

170. A regular donor aged 38 yrs came voluntarily for blood donation. He is otherwise fit but on examination you noted his eyes are red since morning and suspected to be allergic conjunctivitis. As per drug and cosmetic act amendment 2020 what is the deferral for this situation?
- (A) 14 days from the onset of symptoms
 - (B) 28 days from the onset of symptoms
 - (C) 7 days from the onset of symptoms
 - (D) Till symptoms are persisting
171. In 1984, the FDA extended platelet storage period of platelet concentrate from 5 days to 7 days and in 1986 the storage time was changed back to 5 days. Which was the main cause to shorten this shelf life of platelet concentrate?
- (A) TRALI
 - (B) Allergic Reactions
 - (C) Septic transfusion reactions
 - (D) Transfusion associated dyspnoea (TAD)
172. A regular donor aged 28 yrs came voluntarily for blood donation. He is otherwise fit but have history of recent urinary tract infection resolved 1 week back. As per drug and cosmetic act amendment 2020 how will you manage this situation?
- (A) Tell donor to come after 3 weeks from today
 - (B) Tell donor to come after 1 week from today
 - (C) Tell donor to come after 8 weeks from today
 - (D) Tell donor to come after 4 weeks from today
173. A young regular donor aged 24 yrs old came voluntarily for blood donation. He is otherwise fit but have history of taking Acitretin for recently diagnosed acne. He is anxious about this condition. As per drug and cosmetic act amendment 2020 how will you manage this situation?
- (A) Counsel donor to come after 3 weeks from last dose
 - (B) Counsel him he can donate and take donation
 - (C) Tell donor to come after 8 weeks from today
 - (D) Counsel donor to come after 4 weeks from last dose
174. There are two major approaches in preparation of blood components—preparation of blood components from whole blood and by apheresis technique. Which of the following basic principles is similar for these two techniques?
- (A) Intermittent flow centrifugation
 - (B) Sedimentation
 - (C) Continuous flow centrifugation
 - (D) Separation by centrifugation
175. If platelets are to be prepared from whole blood, at what temperature should the blood be maintained after collection, prior to processing?
- (A) 1-6°C
 - (B) 1-10°C
 - (C) 20-24°C
 - (D) 35-37°C

176. Which one of the following statements describes a part of the ideal storage conditions for whole blood-derived platelets?
- Platelets are stored between 20-24°C to prevent bacterial contamination
 - Platelets-storage containers are designed to permit gas exchange
 - Platelets need agitation during storage to prevent ATP production
 - Interruption of agitation for maximum of 24 h is detrimental to platelet recovery
177. Which one of the following statements is accurate for apheresis platelets with added platelet additive solution (PAS)?
- Platelet count of each unit should be a minimum of 3.5×10^{11} platelets, as there is a poor in vivo recovery
 - Platelets are stored in equal amounts of platelet additive solution and plasma
 - The platelet additive solution contains electrolytes and glucose
 - PAS platelets contain a minimum of 5×10^6 leukocytes
178. While counseling donors, "Tell me about" is an example of:
- An open-ended question
 - A closed-ended question
 - An ethnographic interviewing technique
 - Theory-guided inquiry
179. A large outdoor blood donation camp is to be conducted and electricity is not available at the camp site. Which of the following method for Hb estimation is best suitable to screen donors?
- Haemocue
 - Sahli's method
 - Copper sulphate method
 - Cyanmethaemoglobin method
180. Mr. Y goes to a blood bank to donate blood but is advised that he should never donate blood as it may be detrimental for the donor. The possible reason could be:
- Tattoo 5 months earlier
 - Anti rabies vaccine within 1 year
 - Positive for hepatitis A virus before but now negative
 - History of myocardial infarction 2 years back
181. A prospective college student received vaccination for measles, mumps and rubella (MMR) and Human Papilloma Virus (HPV) 2 weeks ago. What is the recommended deferral period for this donor?
- 02 weeks after the date of immunisation of both MMR and HPV
 - 21 days after the date of immunisation of MMR and 02 weeks after date of immunisation of HPV
 - 04 weeks after the date of immunisation of MMR and no deferral period for HPV
 - No deferral period for either

182. A male college student discloses on his donor history questionnaire that he took Isotretinoin for severe acne on and off for 03 years while in high school. His last dose was over 01 year ago. When is the man eligible to donate?
- 14 days after his last dose
 - 1 year after his last dose
 - He is unable to give blood at anytime
 - 1 month after his last dose
183. A donor underwent venepuncture of the antecubital fossa for donation of 1 unit of whole blood. The donation was successful after 3 attempts at venous access. The donation took approximately 5 minutes and after the needle was removed the donor stated that he had pain radiating down his right arm worsening with flexion, along with paraesthesia described as pins and needles. The most common reason for this post donation adverse reaction is?
- Haematoma or bruise
 - Peripheral nerve injury/irritation
 - Arterial puncture
 - Superficial thrombophlebitis
184. An allogeneic male donor presents for apheresis platelet collection and the donor is placed on the apheresis instrument for procedure. Midway through the procedure donor experiences perioral tingling, nausea and muscle cramping. What type of intervention should the collection staff most likely perform during the procedure?
- Slow down the citrate infusion rate and administer oral or intravenous calcium to the donor.
 - Continue the procedure without citrate infusion.
 - Call a neurologist to assess the donor's symptoms.
 - Slow down the calcium infusion rate and administer citrate to the donor.
185. A potential first time blood donor joined her co-workers at their workplace blood drive. On the donation health questionnaire, she reports that today she is healthy but reveals that about 15 years ago she suffered from headaches blurry vision and a seizure. She was diagnosed with a Meningioma for which she underwent resection. She is symptom free and has no restrictions on daily activities. She also says that she is on Doxycycline for dry eyes for past 2 months. When is she eligible to donate blood?
- Defer until she is off Doxycycline for 2 weeks
 - Accept her today
 - Defer her indefinitely
 - Defer her for 12 months
186. A 36-year-old female is being managed in the obstetrics ward for severe post partum haemorrhage and two units of RBCs are ordered. The patient was transfused 6 months ago and an anti-c antibody was identified at that time. The current type and screen specimen is tested and found to be O Rh positive and the antibody screen is negative. Which crossmatch procedure is indicated?
- IS crossmatch of c- RBCs
 - LISS antiglobulin crossmatch of O Rh negative RBCs
 - Computer crossmatch, since the antibody screen is negative
 - PEG antiglobulin crossmatch of O Rh positive units that are c negative.
187. Which of the following methods is most likely to be successful in reducing the risk for TAGHVD?
- Use of frozen, deglycerolized RBC's to remove most WBC's
 - Screening of blood donors for a history of GVHD
 - Use of blood products that have been filtered to remove WBC's
 - Gamma irradiation of blood products to eliminate lymphocyte proliferation

188. A 55-year-old man has a history of peptic ulcer disease. He is admitted following an episode of hematemesis in which he remembers vomiting (about a liter) of dark red bloody emesis into the bathroom sink. He is found to have orthostatic hypotension. His Hgb is 6.8 g/dL, Hct 19.8%, MCV 76 fL, platelet count 98,000/ μ L, and WBC count 10,100/ μ L. His prothrombin time is 12.1 seconds and partial thromboplastin time 26.8 seconds. Which of the following blood products is most appropriate for this man?
- (A) Irradiated RBC's
 - (B) Cryoprecipitate
 - (C) Fresh frozen plasma
 - (D) Packed RBC's
189. A clinical study is performed to determine potential complications of blood product therapy. The transfusion records and medical records of subjects who received blood product therapy are analyzed. It is observed that one subset of subjects developed a sudden drop in blood pressure following transfusion, though they remained afebrile. Which of the following conditions is most likely to be found in this subset of subjects?
- (A) Staphylococcus aureus septicemia
 - (B) Blood group AB negative
 - (C) Graft-versus-host disease
 - (D) IgA deficiency
190. Which of the following blood products is most likely to outdate the quickest?
- (A) Granulocytes
 - (B) Whole blood
 - (C) Packed red blood cells
 - (D) Platelets
191. A deficiency involving which of the following coagulation factors is most likely to be found to require FFP therapy?
- (A) Fibrinogen
 - (B) Prothrombin
 - (C) VonWillebrand factor
 - (D) Factor VIII procoagulant activity
192. A 24-year-old G2 P1 woman gives birth at 35 weeks gestation to twin male infants. Both infants are noted to have marked hydrops along with generalized icterus. The infants' peripheral blood smears demonstrate numerous nucleated RBC's, and the spun hematocrit is only 20%. Which of the following mechanisms is most likely to produce these infants' disease?
- (A) Twin-twin transfusion syndrome
 - (B) Naturally occurring maternal antibodies
 - (C) Fetal autoantibody production
 - (D) Prior maternal alloimmunization
193. A 31-year-old woman has had increasing numbers of pinpoint hemorrhages on her skin for the past month. On physical examination she is afebrile and normotensive. She has petechiae of skin and mucosal surfaces. Laboratory studies shown her platelet count is 10,000/microliter. She receives 10 units of platelets. Following the transfusion, the platelet count is only 2,000/microliter. Which of the following is the most probable cause for this finding?
- (A) Splenomegaly
 - (B) Anti-HLA antibodies
 - (C) Septicemia
 - (D) Hemorrhage

194. For patients with which of the following conditions is use of regular units of PRBCs as likely to be as safe as use of irradiated units?
- Bone marrow transplantation
 - Hodgkin lymphoma
 - DiGeorge anomaly
 - Breast carcinoma
195. A 15-year old girl is diagnosed with acute lymphocytic leukemia. She is being considered for bone marrow transplantation. However, she may then require transfusion of multiple blood products. Use of which of the following products or procedures is most likely to prevent HLA alloimmunization from blood product therapy in this girl?
- Washed RBC's
 - Gamma irradiation
 - Leukodepletion filters
 - Corticosteroid therapy
196. A laboratory study is conducted with subjects who received pooled donor platelets. The transfusion and medical records for these subjects are reviewed. It is observed that some subjects benefitted from this therapy while others did not. For which of the following conditions is a post-transfusion rise in platelet count of $>50,000/\text{microliter}$ most likely to occur?
- Leukemia with splenomegaly
 - Thrombotic thrombocytopenic purpura
 - Alloimmunization
 - VonWillebrand disease
197. A 19-year-old woman is a passenger involved in a motorcycle accident in which she incurs deep lacerations to her extremities. In hospital she has an initial hematocrit of 20%. She begins to receive the first of 3 units of PRBCs. Within an hour her blood pressure drops precipitously. A peripheral blood smear reveals schistocytes. Her prothrombin time and partial thromboplastin time are prolonged. Her urine output drops, and what urine is produced is red-brown. Which of the following complications of blood product therapy has most likely occurred?
- Anaphylactic transfusion reaction
 - Hemolytic transfusion reaction
 - Alloimmunization
 - Febrile transfusion reaction
198. Of the following vacutainer tubes, which should be drawn first:
- Yellow top for blood culture
 - Light-blue top for coagulation studies
 - C Gray top for glucose
 - D Purple top for CBC
199. At which of the following sites can venipuncture be performed without potentially affecting test results?
- In the region of a hematoma
 - At a mastectomy site
 - Near a tattoo
 - In edematous extremities
200. Which of the following vacutainer tubes may be partially filled without affecting test results?
- Red top for total protein
 - Gray top for glucose
 - Light-blue top for protime
 - Purple top for CBC

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