# Government Medical College and Hospital Sector 32, Chandigarh

## Post: Demonstrator (Post-PG) Transfusion Medicine

## QUESTION BOOKLET

**Time: 120 Minutes** **Number of Question: 100** **Maximum Marks: 100**

**Name of Candidate**

**Roll Number: In figure** **In Words**

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**Signature of the Candidate:** _____

**DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO**

**INSTRUCTIONS:-**

1. Write your Roll Number on the Question Booklet and also on the OMR Sheet in the space provided. You will be required to give your thumb impression on the OMR sheet in the space provided.
2. This question booklet contains 100 MCQ's. Once you are permitted to open the Question Booklet, please check for any missing question / misprint etc. and in case of any discrepancy, inform the Assistant Superintendent / Invigilator within 10 minutes of the start of the test.
3. Each question has four alternative answer **(A, B, C, D)** out of which only one is correct. For each question, **darken only one bubble (A or B or C or D),** whichever you think is the correct answer, on the OMR Answer sheet **with Black or Blue Ball Pen only**. Do not use any other Pen / Gel pen /Pencil etc. **Do not Tick √ or × on the OMR Sheet**. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the Questions given in the Question Booklet.
4. Each MCQ is of One (01) mark. There is no negative marking.
5. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the OMR Answer sheet.
6. The OMR Answer sheet is designed for computer evaluation. Therefore, if you do not follow the instructions given, it may make evaluation by the computer difficult. Any resultant loss to the candidates on the above account, i.e. not following instructions completely and properly, shall be the responsibility of the candidates only.
7. After the test, handover the Question Booklet and OMR sheet to the Invigilator on duty.
8. A Candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper or the any assistance or found giving or receiving assistance or found using any other unfair means during the examination will be expelled from the examination by the Centre superintendent/Observer whose decision shall be final.
9. Telecommunication equipment such as pager, cellular phone, wireless, scanner, smart watch/ watch etc. is not permitted inside the examination hall. Use of calculators is not allowed.
10. Candidate should ensure accuracy of their personal details on the OMR Sheet i.e. Name and Roll No. as well as thumb impression. The personal details are to be filled in by the candidates with his/her own hand writing.

TM

1. What is the minimum number of CD34+ cells required to ensure timely engraftment of hematopoietic progenitor cells?
   A. $2 \times 10^3$ CD34+ cells/kg
   B. $2 \times 10^4$ CD34+ cells/kg
   C. $2 \times 10^5$ CD34+ cells/kg
   D. $2 \times 10^6$ CD34+ cells/kg

2. Which red cell abnormality is associated with the Rh null phenotype?
   A. Stomatocytosis
   B. Elliptocytisis
   C. Acanthocytosis
   D. Schistocytosis

3. Which of the following is an indication for therapeutic phlebotomy treatment?
   A. Porphyria cutanea tarda
   B. Psoriasis
   C. Sarcoidosis
   D. Amyloidosis

4. Which of the following lectins is matched appropriately with its target antigen?
   A. Dolichos biflorus: H antigen
   B. Vicea graminea: N antigen
   C. Ulex europaeus: $Sd^a$ antigen
   D. Ulex europaeus: A1 antigen

5. A 40 year old female patient with dengue hemorrhagic fever and platelet count of 8000/µl with bleeding gums, epistaxis and menorrhagia is advised single donor platelet transfusion. Patient is AB Rh D positive but due to non availability of donors of the same group, O Rh D negative single donor apheresis platelet unit is issued to the patient considering the urgency. Patient develops pain in the back, red coloured urine and oliguria 18 hours post transfusion. What is the most likely cause of these symptoms?
   A. Delayed hemolytic transfusion reaction
   B. Acute hemolytic transfusion reaction
   C. Post transfusion purpura
   D. Graft versus host disease

6. Which of the following antibodies could be identified using a patient specimen collected in a plain glass tube, but may **NOT** be identified if a tube with EDTA anticoagulant was used for the collection?
   A. Anti Jka
   B. Anti E
   C. Anti Fya
   D. Anti D

7. A new process is to be implemented in the transfusion laboratory. What would you ensure so that the process consistently produces the desired results?
   A. Quality control
   B. Process validation
   C. Quality indicator
   D. Supplier qualification

8. Which of the following sugars must be present on a precursor substance for A & B antigenic activity to be expressed?
   A. D-glactose
   B. N-acetylgalactosamine
   C. Glucose
   D. L- fucose

9. When a man possesses a phenotypic trait that is expressed in all his daughters and none of his sons, the trait is said to be
   A. X-Linked dominant
   B. X-Linked recessive
   C. Autosomal dominant
   D. Autosomal recessive

10. All of the following are the advantages of Umbilical Cord Blood Stem cell transplant over marrow and peripheral blood **EXCEPT**
   A. Lower incidence of GVHD
   B. Less stringent HLA matching
   C. Hematopoietic stem cells with higher proliferative and self-renewal capacity
   D. Higher cell number

11. A 7-year-old, 20 kg child with Hemophila A has to undergo major abdominal surgery. His factor VIII levels are 1%. It is planned to correct his deficiency by recombinant factor VIII therapy. What is the initial loading dose of factor VIII required?
   A. 1000 IU
   B. 2000 IU
   C. 10000 IU
   D. 20000 IU

12. Which of these organisms is most likely implicated in bacterial contamination during storage of red cells?
   A. Staphylococcus aureus
   B. Pseudomonas Aeruginosa
   C. Yersinia enterocolitica
   D. Klebsiella pneumoniae

13. A 40-year-old male donor with pre donation hemoglobin of 13.5gm/dl and platelet count of 320000/µl was selected for donation of double yield platelets for a patient of leukemia with platelet count of 5000/µl. After 40 minutes of the procedure donor developed paraesthesia over lips and muscle twitching in extremities. Which of the following could be reduced in the donor leading to such symptoms?
   A. Calcium and Potassium
   B. Calcium and Magnesium
   C. Calcium and Sodium
   D. Calcium and Citrate

**14.** A 53-year-old male patient received allogeneic bone marrow transplantation for myelodysplastic syndrome. After 3 weeks of transplantation, the patient developed skin rashes, diarrhoea and fever. Liver function tests were near normal. The skin biopsy revealed features of acute graft versus host disease. Which of the following are implicated to cause transfusion associated graft versus host disease?

A. Donor B lymphocytes
B. Donor Monocytes
C. Donor T lymphocytes
D. Recipient Macrophages

**15.** What is the biological half-life of IgG?

A. 5 days
B. 7 days
C. 14 days
D. 21 days

**16.** What is the mechanism of action of Poly ethylene glycol to enhance antigen-antibody reactions?

A. It decreases the zeta potential
B. It concentrates the antibody by removal of water
C. It increases the antibody affinity for antigen
D. It increases the antibody specificity for antigen

**17.** Which of the following is **NOT** a potentiator in immunohematology?

A. Low ionic strength solution
B. 22% Bovine serum albumin
C. Poly ethylene glycol
D. Dithiothreitol

**18.** Which immunoglobulin class and subclasses are most often associated with severe hemolytic disease of the fetus and newborn?

A. IgG1 and IgG3
B. IgG2 and IgG4
C. IgM and IgG1
D. IgG4 and IgM

**19.** What is the name of the phenomenon in which a false-negative result is obtained in an agglutination-based assay because of an excessively increased ratio of antigen to antibody?

A. Postzone effect
B. Prezone effect
C. Prozone effect
D. Endzone effect

**20.** Which of the following pathways activates complement by recognizing polysaccharides and liposaccharides found on the surfaces of bacteria and tumor cells?

A. Classical pathway
B. Alternative pathway
C. Lectin pathway
D. Cell mediated pathway

**21.** A request is received in the blood center for 2 units of blood for a thalassemia major patient. On testing, the antibody screen and identification panel is found to be positive. The patient specimen is retested with antibody panel cells that have been treated with Dithiothreitol. The antibody no longer reacts against cells in the antibody panel. Which of the following antibodies is most consistent with these results?

A. Anti Fya
B. Anti K
C. Anti Jkb
D. Anti M

**22.** Which of the following is a clinically significant antibody whose detection may be dependent on anticomplement activity in polyspecific AHG?

A. Anti Jka
B. Anti C
C. Anti P1
D. Anti D

**23.** Mr X is a known case of Hemophilia A. He presented to the hospital with a left knee bleed. The hospital is having only plasma derived factor concentrate available which has been solvent detergent and heat treated. Which pathogen is most likely to be transmitted by such a concentrate?

A. Hepatitis A virus
B. Hepatitis B virus
C. Hepatitis C virus
D. Human immunodeficiency virus

**24.** Which of the following is an absolute indication for gamma irradiation of cellular blood components?

A. Repeated febrile non hemolytic transfusion reaction
B. Severe combined immunodeficiency
C. HIV infection
D. Systemic lupus erythematosus

**25.** The antibody against which platelet antigen is the most frequent cause of fetal and neonatal alloimmune thrombocytopenia?

A. HPA-1a
B. HPA-5b
C. HPA-3a
D. HPA-4b

**26.** RhIg immunoprophylaxis is indicated in which of the following circumstances?

A. Mother weak D-positive, infant D-positive
B. Mother weak D-positive, infant D-negative
C. Mother D-negative, infant D-negative and weak D negative
D. Mother D-negative, infant weak D-positive

**27.** Following vascular injury which receptor on platelet favours binding to vWF and facilitates platelet adhesion to vascular endothelium?

A. GPIb/V/IX
B. GPIa/IIa
C. GpIIb/IIIa
D. GPIIb/V/IX

**28.** Which of the following is **NOT** a feature of intravascular hemolysis?

A. Increased lactate dehydrogenase in serum
B. Hemosiderin in urine
C. Increased serum haptoglobin
D. Hemoglobin in urine

**29.** A 37-year-old male patient is admitted for hematopoietic stem cell transplantation for Non-Hodgkin's lymphoma. The blood group of patient is A RhD positive. An HLA matched donor is available and his blood group is O RhD positive. What is this type of incompatibility called?

A. Major incompatibility
B. Minor incompatibility
C. Bidirectional incompatibility
D. Compatible match

**30.** Middle cerebral artery-peak systolic velocity is used for assessment of which of the following parameters in haemolytic disease of the fetus and newborn?

A. Fetal bilirubin
B. Fetal blood type
C. Maternal bilirubin
D. Fetal anemia

**31.** Red blood cells with Fy (a-b-) phenotype are resistant to invasion by which of the following species of Plasmodium?

A. Plasmodium vivax
B. Plasmodium falciparum
C. Plasmodium ovale
D. Plasmodium malariae

**32.** Which are the genes responsible for the production of Rh antigens?

A. RH1, RH2
B. RHAG, RHDCE
C. RHAG, RHD, RHCE
D. RHD, RHC, RHE

**33.** Which alloantibody is most likely to be produced if a patient that has the Rh genotype of R1R1 is transfused with red blood cells that have an Rh genotype of R0R0?

A. Anti C
B. Anti c
C. Anti E
D. Anti e

**34.** What is the composition of HbH inclusions in alpha thalassemia?

A. α4 tetramers
B. ε4 tetramers
C. β4 tetramers
D. γ4 tetramers

**35.** Which of the following is the most type of common mutation in alpha thalassemia?

A. Point mutation
B. Insertion
C. Stop codon
D. Deletion

**36.** Which of the following antibody is neutralizable?

A. anti-D
B. anti-$Jk^a$
C. anti-$Le^a$
D. anti –M

**37.** Eight units of platelets were pooled without using a sterile connecting device. What will be the new expiry date?

A. 2 hours
B. 6 hours
C. 4 hours
D. 24 hours

**38.** Which blood group antigen is **NOT** an integral part of RBC membrane?

A. Lewis blood group system
B. Kell blood group system
C. Rh blood group system
D. Diego blood group system

**39.** Which of the following cells are implicated in passenger lymphocyte syndrome?

A. T-lymphocytes of donor
B. T-lymphocytes of recipient
C. B-lymphocytes of donor
D. B-lymphocytes of recipient

**40.** According to latest BMW guidelines, all glassware is disposed off in which colour coded container?

A. Red
B. Green
C. Yellow
D. Blue

41. Which of the following statement is **INCORRECT** about Single Donor Platelets collected using automated cell separators?
    A. Single donor platelets contain at least $3 \times 10^{11}$ platelets
    B. AABB standards require that 90% of concentrates meet the same quantitative standard
    C. Maximum 36 single donor platelets can be collected from a donor in a year
    D. Dose of platelets in a single donor platelets is equivalent to 5-6 units of random donor platelets

42. Anticoagulation with heparin is required for which of the procedure?
    A. Therapeutic plasma exchange
    B. Low density lipoprotein (LDL) apheresis
    C. Hematopoietic stem cell collection
    D. Red cell exchange

43. Which component is removed during a leukapheresis procedure?
    A. Red cells
    B. Buffy coat
    C. Platelet rich plasma
    D. Plasma

**44.** Anti-Glomerular Basement Membrane Disease with Diffuse Alveolar Hemorrhage is categorized under which American Society of Apheresis (ASFA) guidelines category of indication for apheresis?
    A. Category I
    B. Category II
    C. Category III
    D. Category IV

**45.** For 100 ml of blood collection, CPDA1 required is:
    A. 7 ml
    B. 14 ml
    C. 49 ml
    D. 63 ml

**46.** A blood unit was collected in Quadruple 450 ml blood bag containing Citrate Phosphate Dextrose (CPD) as anticoagulant and Saline adenine Glucose Mannitol (SAGM) as additive solution. At the time of component preparation, technician forgot to add SAGM into the red blood cells. What should be the shelf life of that red blood cell unit?
    A. 42 days
    B. 35 days
    C. 28 days
    D. 21 days

**47.** A laboratory wishes to implement a new automated analyser. The instrument is expected to run 100 specimens per hour with turnaround time 10 minutes per specimen and a failure rate of less than 1%. The process that demonstrates this instrument meets customer specifications is called:

A. Calibration
B. Validation
C. Performance Qualification
D. Quality Control

**48.** A 20- year old male patient has an inherited bleeding disorder characterised by a prolonged bleeding time, normal platelet count, variably prolonged activated partial thromboplastin time and normal Prothrombin time. The most likely diagnosis is:

A. Factor VIII deficiency
B. Factor IX deficiency
C. Glanzmann thrombasthenia
D. Von Willebrand disease

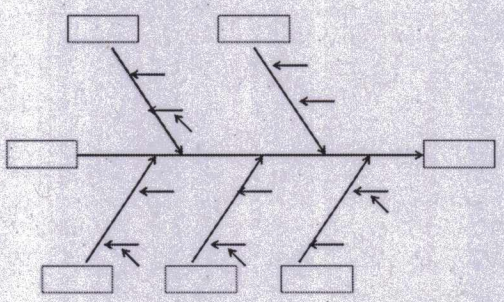
**49.** Type IV hypersensitivity reaction is mainly mediated by which cells

A. Neutrophils
B. Plasma cells
C. Mast cells
**D.** T helper cells

**50.** Which of the following red cell antigen acts as a urea transporter on red cell membrane?

A. Kell antigen
B. Rh antigen
C. Kidd antigen
D. Diego antigen

**51.** The following diagram shown:



A. Is an outline of Parato diagram
B. Is an outline of Ishikawa diagram
C. Is an outline of procedure flow diagram
D. Is an outline of process flow diagram

**52.** A Blood Centre Incharge has received a red cell identification (ID) panel from South East Asia. Which additional red cell antigen will be present on red cells in this ID panel?

A. Lu antigen
B. Mur antigen
C. S antigen
D. $Le^a$ antigen

**53.** All of the following statements are true about Forms **EXCEPT**:

A. Blank Forms provide template for capture of information
B. Anyone can design a form
C. A form becomes a record once completed providing objective evidence of work performed
D. Forms should be managed within document control

**54.** A 17 year old haemophiliac patient developed wheals, itching, hypotension and difficulty in breathing within 15 minutes of fresh frozen plasma transfusion. The transfusion was stopped immediately and patient was given hydrocortisone and was put on oxygen support. Blood bag along with post transfusion samples were sent to the blood centre for further work up. Blood centre work up was negative. The pre-transfusion and post-reaction vitals are as shown

| | Blood Pressure (mmHg) | Pulse (bpm) | Respiratory rate(breath cycle per min) | Oxygen saturation ($SPO_2$) | Temperature |
|---|---|---|---|---|---|
| Pre-transfusion | 120/80 | 74 | 18 | 99% | $98.6^0F$ |
| Post-reaction | 90/60 | 102 | 28 | 86% | $98.6^0F$ |

Classify the transfusion reaction

A. Allergic transfusion reaction
B. Anaphylactic transfusion reaction
C. Transfusion associated dyspnea
D. Transfusion associated circulatory overload

**55.** A 10 year old thalassemic female patient comes to the blood centre for regular transfusion. The resident noted that the patient experienced severe allergic reactions during the last two transfusions. Which type of red cell should be transfused to the patient now?

A. Packed red blood cells
B. Washed red blood cells
C. Leucoreduced red blood cells
D. Buffy coat reduced packed red blood cells

56. Which one of the following important anti neutrophil antibody implicated in causing TRALI

A. HNA-3a
B. HNA-2a
C. HNA-1a
D. None of the above

**57.** Which of the following is right about granulocyte concentrate storage?

A. Can store at 20-24$^0$C temperature for 24hrs with continuous agitation
B. Can store at 20-24$^0$C temperature for 5 days with continuous agitation
**C.** Can store at 20-24$^0$C temperature for 5 days without agitation
D. Can store at 20-24$^0$C temperature for 24 hrs without agitation

**58.** Which of the following blood component **DOES NOT** need to be crossmatched with patient's serum sample?

A. Apheresis product containing 3 ml of red cells
B. Granulocytes collected by apheresis
C. Leukocyte reduced RBCs
D. Pooled platelet product containing 1.5 ml of red cells

**59.** Donation interval for whole blood donation after bone marrow harvest is:

A. 3 months
B. 6 months
C. 9 months
D. 12 months

**60.** All of the following are recommended replacement fluids for Therapeutic Plasma Exchange EXCEPT?

A. Fresh Frozen Plasma
B. 5% Albumin
C. 20% albumin
D. Normal saline

**61.** Immunoadsorption columns are recommended for which of the following indication as per American Society of Apheresis (ASFA) guidelines?

A. ANCA associated vasculitis
B. ABO incompatible renal transplant
C. Thrombotic Thrombocytopenic Purpura
D. Stiff person syndrome

**62.** Nursing staff is about to start transfusion of a blood unit to the patient, which of the following step she is doing wrong to prepare the patient for transfusion?

A. Verify the physician's order
B. Verify that informed consent was obtained
C. Add medication to the blood component
D. Check the patient identity

**63.** Which of the following would be appropriate therapy for the treatment of perioral parasthesias caused by citrate?

A. Ignore the symptoms because they are mild and occur commonly
B. Discontinue the procedure and restart the procedure without any anticoagulant
C. Increase the whole blood-to-citrate ratio
D. Increase the rate of reinfusion

**64.** Which of the following blood component is not a potent cause of transfusion related acute lung injury (TRALI)?

A. Red cell concentrate
B. Fresh Frozen Plasma
C. Solvent detergent treated plasma
D. Leukoreduced platelet concentrate

**65.** Which phenotype is associated with enhanced expression of D antigen?

A. DIV
B. Del
C. $DC^{w}$-
D. DHAR

**66.** Which of the following changes are seen in a RBC unit stored in CPDA-1 solution at the end of 35 days storage?

A. Decrease in supernatant potassium concentration
B. Decrease in 2,3-DPG
C. Decrease in supernatant Hb concentration
D. Decrease in percentage of viable cells at 24 hours following transfusion

**67.** Blood group B Rh D positive packed red cell unit was issued for a patient having haemoglobin of 5 g/dl. Before staring the transfusion, the resident doctor observed that the historic blood group of the patient is A Rh D positive. Further checks revealed that a wrong blood unit has been issued. The resident doctor returned the blood unit and also reported the incident to the blood center. This is an example of

A. Adverse event
B. Adverse reaction
C. Near miss event
D. Adverse incident

**68.** Apheresis technology can be used to collect each of the following components except:

A. Leukocytes
B. Macrophages
C. Hematopoietic progenitor cells
D. Platelets

**69.** Which of the following statement is **INCORRECT** about FORS blood group system?

A. The system belongs to protein blood group system
B. The system harbors a single low prevalence antigen
C. The antigen bears resemblance to A antigen
D. The anti-FORS1 antibodies may cause hemolysis in vitro

**70.** All of the following are correct about Autologous donation **EXCEPT:**

A. Minimum hemoglobin required for autologous donation is 11 g/dl
B. Collection should be at least 72 hours before anticipated surgery or transfusion
C. Unstable angina is not a contraindication to autologous donation
D. The most appropriate candidates are alloimmunised donors for whom compatible blood is hard to collect

**71.** You are in-charge of a blood bank and your licence is expiring on 5.12.2023. For renewal of licence of blood and blood components, you will apply on

A. Form 27-C
B. Form 28-E
C. Form 27-E
D. Form 26-I

**72.** HLA class I molecules are present on all of the following **EXCEPT**

A. Platelets
B. Red blood cells
C. Monocytes
D. Lymphocytes

**73.** Which one of the following is the latest blood group included in ISBT

A. AUG
B. FORS
C. LAN
D. VEL

**74.** Haemoglobin F is increased in all of the following **EXCEPT**

A. Thalassaemia
B. Megaloblastic anaemia
C. Iron deficiency anaemia
D. Pregnancy

**75.** A 45-year-old male is admitted for an exploratory laparotomy. Patient's blood group is O positive. Type and antibody screen is ordered prior to his scheduled surgery. Three cell antibody screen was negative at 37°C and Anti-human globulin phase using tube method. One drop of Coombs' check cells was added to each tube, and the results were negative. Which of the following is CORRECT interpretation?

A. Antibody screen is negative
B. Antibody screen needs to be repeated
C. Saline washing was adequate
D. Reactive AHG was added

**76.** Regarding Haemovigilance programme of India all are true **EXCEPT**

A. Reporting is mandatory
B. Only severe Febrile non haemolytic transfusion reactions are reported at international level
C. It is under National Institute of Biologicals
D. Donor haemovigilance was started in 2015

**77.** Low Ionic Strength Solutions generally contain

A. 0.2% sodium chloride
B. 0.3% sodium chloride
C. 0.4% sodium chloride
D. 0.5% sodium chloride

**78.** Intrauterine transfusion requires all of the following **EXCEPT**

A. Irradiation of the unit
B. Cytomegalovirus negative Packed Red Blood Cells(PRBC)
C. Haematocrit of transfused unit of 60%
D. Antigen negative PRBC to which antibody is present

**79.** All are true regarding post transfusion purpura **EXCEPT**

A. Occurs mostly 2-3 days after transfusion
B. Mostly confused with heparin induced thrombocytopenia clinically
C. Platelet counts are usually less than 10000/μl
D. Anti HPA1a is most commonly implicated

**80.** What should be the Factor VIII levels in one unit of cryoprecipitate to meet quality control criteria as per Director General of Health Services?

A. 60-70 IU
B. 70-90 IU
C. 80-120 IU
D. 80-140 IU

**81.** Which of the following is **FALSE** regarding irradiated blood components?

A. Radiation dose is 25-50 Gy with a minimum delivery of 25Gy to any portion(US standard)
B. Platelet shelf life stays the same
C. Patients of severe combined immunodeficiency should receive irradiated blood
D. Shelf life of packed red cells is reduced 28 days post irradiation or stays at its original expiry whichever is earlier (US standard)

**82.** A 50-year-old multitransfused patient requires 3 units of PRBCs. On crossmatching, 2 out 3 units were found to be incompatible. Antibody screen and identification reveals anti c and anti $Fy^a$ in the patient. Assuming the prevalence of c antigen as 55% and $Fy^a$ antigen as 60% in your donor population, how many units do we need to type to find 3 units of antigen negative compatible blood for this patient?

A. 12
B. 16
C. 14
D. 20

**83.** Which of the following statements regarding Hepatitis C virus is **FALSE**?

A. HCV is a small, non-enveloped, single stranded RNA virus
B. Sexual and vertical transmissions are uncommon
C. Co-infection with HIV increases transmission rates by sexual and vertical routes
D. Donor questionnaires have limited potential to exclude individuals who maybe harbouring HCV infection

**84.** Enzyme treatment weakens, destroys or enhances all of the following antigens **EXCEPT**

A. Duffy
B. Kidd
C. MNS
D. Kell

**85.** Which of the following statement is **INCORRECT** regarding frozen RBCs?

A. RBCs can be frozen and stored for upto 10 years after addition of glycerol
B. Thawing and deglycerolisation is required before transfusion.
C. Shelf life of RBCs deglycerolised in a closed system is 21 days
D. Measurement of free haemoglobin in final wash can confirm adequate free haemoglobin removal and adequate deglycerolisation

**86.** All statements are true for Transfusion related acute lung injury (TRALI) **EXCEPT**

A. There is initial leucopenia
B. In the new consensus definition of TRALI, possible TRALI was dropped
C. Hypertension is a usual presentation
D. Onset within 6 hours of transfusion

**87.** All of the following are contents of the dense granules of platelets **EXCEPT**

A. Calcium
B. Serotonin
C. Thrombospondin
D. Catecholamines

**88.** In the iron cycle, the transferrin receptor carries

A. Iron out of duodenal cells from intestinal lumen
B. Iron out of duodenal cells into plasma
C. Transferrin bound iron in the plasma
D. Transferrin bound iron into erythrocytes

**89.** Which of the following statement regarding central vein catheters (CVCs) is **TRUE** with regards to therapeutic apheresis

A. One with flexible walls is preferred to allow manoeuvring
B. Tunneled catheters have lower rate of infection
C. Catheters placed in femoral vein have lesser risk of infection compared to those placed in subclavian/internal jugular vein
D. CVCs are preferred for occasional and infrequent procedures

**90.** Citrate used as an anticoagulant in apheresis procedures is metabolised and removed from the body by all **EXCEPT**

A. Kidney
B. Liver
C. Skeletal muscle
D. Sweat glands

**91.** For a double red blood cell collection, the haematocrit should be

A. 20%
B. 30%
C. 40%
D. 45%

**92.** The signs and symptoms of hypocalcaemia due to citrate toxicity in the order of appearance are

A. Perioral and acral paresthesias, light-headedness, nausea and vomiting, tetany
B. Light-headedness, nausea and vomiting, perioral and acral paresthesias, tetany
C. Light-headedness, perioral and acral paresthesias, nausea and vomiting, Tetany
D. Light-headedness, perioral and acral paresthesias, tetany, nausea and vomiting

**93.** All of the following are complications of massive transfusion **EXCEPT**

A. Hypocalcemia
B. Hypomagnesemia
C. Hyperglycemia
D. Hypoproteinemia

**94.** Which of the following form of haemoglobin molecule has the lowest affinity for oxygen?

A. Tense
B. Relaxed
C. Arterial
D. Venous

**95.** An 18-year-old male involved in a road side accident presents to the emergency with splenic laceration and a haemoglobin of 6gm/dl. Two units of packed red cells are ordered. After transfusing the first unit, he complains of tightness in the chest and dyspnoea along with rigors. On examination, the following pre and post transfusion vitals are recorded:

| Vital | Pre transfusion | Post transfusion |
|---|---|---|
| Temperature | 37°C | 37.5°C |
| Pulse | 84/min | 104/min |
| BP | 110/70mmHg | 90/60mmHg |
| RR | 18/min | 24/min |
| $SpO_2$ | 97% | 86% |

Workup of transfusion reaction reveals no clerical errors, ABO matched and compatible unit was issued, blood culture of bag, Direct antiglobulin test and antibody screen of post transfusion sample were negative. What further management and investigations should be advised?

A. Respiratory support and chest X-ray
B. Diuretics and echocardiography
C. Diuretics and urine haemoglobin/hemosiderin
D. Broad spectrum antibiotics and blood culture of patient

**96.** Molecular testing for predicting red cell antigens is useful in all of the following **EXCEPT**

A. In quantitative gene expression analysis
B. Antibody typing reagent is not available
C. Distinguishing an alloantibody from an autoantibody
D. Resolving blood group discrepancies

**97.** Type 2 precursor chain has

A. Terminal galactose in a 1-3 linkage to subterminal N acetylglucosamine
B. Terminal galactose in a 1-4 linkage to subterminal N acetylglucosamine
C. Terminal fucose in a 1-3 linkage to subterminal N acetylglucosamine
D. Terminal fucose in a 1-4 linkage to subterminal N acetylglucosamine

**98.** Hold over time for blood storage refrigerator is defined as

A. A half load of blood units at 4° C takes at least 1 hour to rise above +6° C
B. A full load of blood units at 4° C takes at least 1 hour to rise above +6° C
C. A half load of blood units at 4° C takes at least 2 hours to rise above +6°C
D. A full load of blood units at 4° C takes at least 2 hours to rise above +6° C

**99.** Secretions of a person with the genes *B, Se,* and *Le* contain which of the following?

A. B substance, H substance, $Le^a$ and $Le^b$ substances
B. B substance, $Le^a$ substance
C. H substance, $Le^a$ and $Le^b$ substances
D. H substance, $Le^a$ substance

**100.** Many warm reactive autoantibodies have a broad specificity within which of the following blood group system

A. Rh
B. Kell
C. Duffy
D. Kidd

## SUBJECT: TRANSFUSION MEDICINE

| | |
|---|---|
| 1 | D |
| 2 | A |
| 3 | A |
| 4 | B |
| 5 | B |
| 6 | A |
| 7 | B |
| 8 | D |
| 9 | A |
| 10 | D |
| 11 | A |
| 12 | C |
| 13 | B |
| 14 | C |
| 15 | D |
| 16 | B |
| 17 | D |
| 18 | A |
| 19 | A |
| 20 | B |

| | |
|---|---|
| 21 | B |
| 22 | A |
| 23 | A |
| 24 | B |
| 25 | A |
| 26 | D |
| 27 | A |
| 28 | C |
| 29 | B |
| 30 | D |
| 31 | A |
| 32 | C |
| 33 | B |
| 34 | C |
| 35 | D |
| 36 | C |
| 37 | C |
| 38 | A |
| 39 | C |
| 40 | D |

| | |
|---|---|
| 41 | C |
| 42 | B |
| 43 | B |
| 44 | A |
| 45 | B |
| 46 | D |
| 47 | C |
| 48 | D |
| 49 | D |
| 50 | C |
| 51 | B |
| 52 | B |
| 53 | B |
| 54 | B |
| 55 | B |
| 56 | A |
| 57 | D |
| 58 | D |
| 59 | D |
| 60 | C |

| | |
|---|---|
| 61 | B |
| 62 | C |
| 63 | C |
| 64 | C |
| 65 | C |
| 66 | B |
| 67 | C |
| 68 | B |
| 69 | A |
| 70 | C |
| 71 | A |
| 72 | B |
| 73 | A |
| 74 | C |
| 75 | B |
| 76 | A |
| 77 | A |
| 78 | C |
| 79 | A |
| 80 | C |

| | |
|---|---|
| 81 | A |
| 82 | B |
| 83 | A |
| 84 | D |
| 85 | C |
| 86 | C |
| 87 | C |
| 88 | D |
| 89 | B |
| 90 | D |
| 91 | C |
| 92 | A |
| 93 | D |
| 94 | A |
| 95 | A |
| 96 | A |
| 97 | B |
| 98 | B |
| 99 | A |
| 100 | A |