

## BAB

### PROVISIONAL ANSWER KEY (CBRT)

Name of the post	Assistant Professor, Immuno Hematology and Blood Transfusion Class-2
Advertisement No.	77/ 2020-21
Preliminary Test held on	14-09-2021
Question No	001 – 200 (Concern Subject)
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THE LINK FOR ONLINE OBJECTION SYSTEM WILL START FROM 16-09-2021; 04:00 PM ONWARDS

### Instructions / સૂચન

**Candidate must ensure compliance to the instructions mentioned below, else objections shall not be considered: -**

- (1) All the suggestion should be submitted through **ONLINE OBJECTION SUBMISSION SYSTEM** only. Physical submission of suggestions will not be considered.
- (2) Question wise suggestion to be submitted in the prescribed format (proforma) published on the website / online objection submission system.
- (3) All suggestions are to be submitted with reference to the Master Question Paper with provisional answer key (Master Question Paper), published herewith on the website / online objection submission system. Objections should be sent referring to the Question, Question No. & options of the Master Question Paper.
- (4) Suggestions regarding question nos. and options other than provisional answer key (Master Question Paper) shall not be considered.
- (5) Objections and answers suggested by the candidate should be in compliance with the responses given by him in his answer sheet. Objections shall not be considered, in case, if responses given in the answer sheet /response sheet and submitted suggestions are differed.
- (6) Objection for each question should be made on separate sheet. Objection for more than one question in single sheet shall not be considered.

**ઉમેદવારે નીચેની સૂચનાઓનું પાલન કરવાની તકેદારી રાખવી, અન્યથા વાંધા-સૂચન અંગે કરેલ રજૂઆતો ધ્યાને લેવાશે નહીં**

- (1) ઉમેદવારે વાંધા-સૂચનો ફક્ત ઓનલાઇન ઓબ્જેક્શન સબમીશન સીસ્ટમ દ્વારા જ સબમીટ કરવાના રહેશે. રૂબરૂ અથવા ટપાલ દ્વારા આયોગની કચેરીએ મોકલવા આવેલ વાંધા-સૂચનો ધ્યાને લેવામા આવશે નહીં જેની ખાસ નોંધ લેવી.
- (2) ઉમેદવારે વાંધા-સૂચનો રજૂ કરવા વેબસાઇટ / ઓનલાઇન ઓબ્જેક્શન સબમીશન સીસ્ટમ પર પ્રસિધ્ધ થયેલ નિયત નમૂનાનો જ ઉપયોગ કરવો.
- (3) ઉમેદવારે પોતાને પરીક્ષામાં મળેલ પ્રશ્નપુસ્તિકામાં છપાયેલ પ્રશ્નક્રમાંક મુજબ વાંધા-સૂચનો રજૂ કરતા તમામ વાંધા-સૂચનો વેબસાઇટ પર પ્રસિધ્ધ થયેલ પ્રોવિઝનલ આન્સર કી (માસ્ટર પ્રશ્નપત્ર)ના પ્રશ્ન ક્રમાંક મુજબ અને તે સંદર્ભમાં રજૂ કરવા.
- (4) માસ્ટર પ્રશ્નપત્રમાં નિર્દિષ્ટ પ્રશ્ન અને વિકલ્પ સિવાયના વાંધા-સૂચનો ધ્યાને લેવામાં આવશે નહીં.
- (5) ઉમેદવારે પ્રશ્નના વિકલ્પ પર વાંધો રજૂ કરેલ છે અને વિકલ્પ રૂપે જે જવાબ સૂચવેલ છે એ જવાબ ઉમેદવારે પોતાની ઉત્તરવહીમાં આપેલ હોવો જોઈએ. ઉમેદવારે સૂચવેલ જવાબ અને ઉત્તરવહીનો જવાબ ભિન્ન હશે તો ઉમેદવારે રજૂ કરેલ વાંધા-સૂચનો ધ્યાનમા લેવાશે નહીં.
- (6) એક પ્રશ્ન માટે એક જ વાંધા-સૂચન પત્રક વાપરવું. એક જ વાંધા-સૂચનો પત્રકમાં એકથી વધારે પ્રશ્નોની રજૂઆત કરેલ હશે તો તે અંગેના વાંધા-સૂચનો ધ્યાને લેવાશે નહીં.

**Website link for online objection submission system : [www.safevaults.in/login](http://www.safevaults.in/login)**

001. Which is not step of Descriptive Statistics?  
 (A) Collecting (B) Organizing  
 (C) Hypothesis testing (D) Presenting Data
002. If Class intervals are not given, then it is called as a \_\_\_\_\_.  
 (A) Discrete Frequency Distribution (B) Continuous Frequency Distribution  
 (C) Grouped Frequency Distribution (D) None of the above
003. Which is NOT type of variability?  
 (A) Biological variability  (B) Random variability  
 (C) Real variability (D) Experimental variability
004. Which is NOT type of Measure of Dispersion?  
 (A) Mean  (B) Range  
 (C) Mean absolute deviation (D) Standard Deviation
005.  $r = 0$  indicates  
 (A) A positive correlation between variables  
 (B) A negative correlation between variables  
 (C) No correlation between variables  
 (D) All of the above
006. The fecal-oral route is common in transmitting which of these hepatitis viruses?  
 (A) HAV (B) HBV  
 (C) HDV (D) HCV
007. Currently, steps taken to reduce transfusion-transmitted CMV include:  
 (A) Plaque reduction neutralization test (B) NAT testing  
 (C) Leukoreduction (D) Minipool screening
008. Which of the following is the most common cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma in the United States?  
 (A) HAV (B) HBV  
 (C) HCV (D) HDV
009. Transient aplastic crisis can occur with:  
 (A) Parvovirus B19. (B) WNV.  
 (C) CMV. (D) EBV.
010. What is the most common parasitic complication of transfusion?  
 (A) Babesiamicroti (B) Trypanosomacruzi  
 (C) Plasmodium species (D) Toxoplasma gondii
011. Window period for HCV by ID NAT is  
 (A) 7.1 days (B) 5.3 days  
 (C) 2.2 days (D) 10.3 days
012. HIV-2 is different in characteristics from HIV-1 by presence of  
 (A) gp 36 (B) gp 160  
 (C) p 66 (D) p31

013. Which is the Licence approving authority for blood transfusion services in INDIA?  
(A) NACO (B) NBTC  
(C) DCGI (D) CLAA
014. Which infectious agent is commonly transmitted by WBCs?  
(A) HIV (B) CMV  
(C) Treponema (D) MP
015. Granulocyte stored at  
(A) 2-8°C (B) 20°C-22°C  
(C) -40°C (D) -80°C
016. LISS does not contain  
(A) Sod Glycinate (B) Saline  
(C) Sod Ascorbate (D) Phosphate buffer
017. Ratio of ACD in blood Bag should be  
(A) 14 ml / 100 ml (B) 15 ml / 100 ml  
(C) 16 ml / 100 ml (D) 5 ml / 100 ml
018. Which of the following is false regarding quality control of cell reagent  
(A) No hemolysis  
(B) No turbidity  
(C) Clear cut reaction with Known antisera  
(D) Weekly assessment
019. How many objectives are there in National Blood Policy and National Plasma Policy respectively?  
(A) 8, 5 (B) 5, 8  
(C) 9, 6 (D) 6, 9
020. The transfusion of directed donor RBC units has been shown:  
(A) To reduce the cost associated with donor testing  
(B) To reduce the risk of TA-GVHD  
(C) To reduce the risk of RBC alloimmunization  
(D) To provide no transfusion safety benefit
021. A pH of \_\_\_\_\_ should be maintained throughout the storage period of platelets  
(A) 5.5 (B) 6.0  
(C) 6.5 (D) 7.0
022. TMA produces \_\_\_\_\_ RNA Amplicons per cycle  
(A) 10-100 (B) 100-1000  
(C) 1000-10000 (D) 1 Lac
023. Analytical sensitivity of (95% LOD) in ID NAT  
(A) 28.6 IU/ml (B) 52 IU/ml  
(C) 3.1 IU/ml (D) 6.8 IU/ml

024. Which of the following is true of hepatitis B vaccination?  
(A) The vaccine is made in a bacterium       (B) The vaccine is made in a yeast  
(C) The vaccine can transmit HIV      (D) The vaccine is given in a single-shot dose
025. Which of the following products does not transmit hepatitis?  
(A) Packed red cells      (B) Fresh frozen plasma  
(C) Platelets       (D) Plasma protein fraction
026. HIV seropositivity is highly prevalent in all of the following except:  
(A) Intravenous drug users      (B) Homosexuals  
(C) Hemophiliacs       (D) Health-care workers
027. Individuals who have received injections of human growth hormone are permanently deferred from blood donation because of the possible transmission of an agent responsible for which of the following diseases?  
(A) AIDS      (B) Hepatitis  
 (C) Creutzfeldt Jakob–disease      (D) Infectious mononucleosis
028. Chagas disease can be transmitted by blood infected with:  
(A) *Treponemapallidum*      (B) *Mycoplasma pneumoniae*  
(C) *Yersinia enterocolitica*       (D) *Trypanosomacruzi*
029. ISBT 128 Labelling system is used for :-  
 (A) Globally accepted blood donation numbering system  
(B) Globally accepted unique numbering system for rare blood group donor register  
(C) Coding system includes patient information  
(D) Coding system to transfer patient internationally with any trouble
030. Levey Jenning’s Chart is  
(A) Graphical method for displaying control results and for evaluation of procedures of kits used for testing TTI  
(B) Follow Westgard’ s rule  
(C) Used for monitoring QC data  
 (D) All of the above
031. Criteria for PAD (Preoperative autologous donation) is all except,  
(A) Hb  $\geq$  11 gm%  
(B) No specific weight is required  
(C) No age limit , minors can donate with consent given by parents  
 (D) None of the above
032. Absolute contraindication for PAD are  
(A) Unstable angina      (B) CAD  
(C) Active seizure disorder       (D) All of the above

033. Massive transfusion is indicated in  
 (A) Medical emergencies e.g. GI bleeding, obstetric cases  
 (B) Organ transplant e.g. Liver Transplant  
 (C) Exchange Transfusion  
 (D) All of the above
034. Which of following biochemical test is not a definitive test to diagnose G6PD deficiency  
 (A) MTT (B) Spectrophotometry  
 (C) Differential Ph metry (D) Sequencing of G6PD gene
035. True about EPO, is  
 (A) Glycoprotein in nature  
 (B) Produced by Kidney  
 (C) Recombinant EPO used in anaemia due to CRF or chronic diseases  
 (D) All of the above
036. Adverse effects following Albumin administration are all, except  
 (A) Anaphylactic reaction (B) Circulatory overload  
 (C) Febrile reaction  (D) Hypertension due to vasoactive substances
037. Which of following is not true about Hemo-Cue  
 (A) Hb measuring range is 0- 25.6 gm / dl  
 (B) Based on cyanmethaemoglobin (HICN) method  
 (C) WHO approved method for donor screening in blood donation camps  
 (D) None of the above
038. Which of following is not correct  
 (A) DolichosBiflorus have anti-A1 activity  
 (B) UlexEuropeus have anti-H activity  
 (C) ViciaGramineahave Anti-N activity  
 (D) Arachis Hypogea have Anti-H activity
039. Which of the following cells is involved in antigen recognition following phagocytosis?  
 (A) B lymphocytes  (B) T lymphocytes  
 (C) Macrophages (D) Granulocytes
040. Which of the following immunoglobulins is produced in the secondary immune response?  
 (A) IgA (B) IgE  
 (C) IgG (D) IgM
041. Which of the following immunoglobulins is most efficient at binding complement?  
 (A) IgA (B) IgE  
 (C) IgG  (D) IgM
042. Which portion of the immunoglobulin molecules contains complement binding sites?  
 (A) Heavy chain variable region (B) Light chain variable region  
 (C) Heavy chain constant region (D) Light chain constant region

043. Which complement pathway is activated by the formation of antigen-antibody complexes?  
 (A) Classical (B) Alternative  
 (C) Lectin (D) Retro
044. Which of the following refers to the presence of an excess amount of antibody present in a test system?  
 (A) Postzone  (B) Prozone  
 (C) Zone of equivalence (D) Endzone
045. Which of the following refers to a state of equilibrium in antigen-antibody reactions?  
 (A) Postzone (B) Prozone  
 (C) Zone of equivalence (D) Endzone
046. Select the term that describes the unique confirmation of the antigen that allows recognition by a corresponding antibody:  
 (A) Immunogen  (B) Epitope  
 (C) Avidity (D) Clone
047. What common cryoprotectant is added to HPC products for freezing?  
 (A) Polyethylene glycol (B) Glycerol  
 (C) Dimethyl sulfoxide (D) Normal saline
048. What is the minimum number of platelets required in a platelet concentrate prepared from whole blood by centrifugation (90% of sampled units)?  
 (A)  $5.5 \times 10^{11}$  (B)  $3 \times 10^{10}$   
 (C)  $3 \times 10^{11}$   (D)  $5.5 \times 10^{10}$
049. Additive solutions are approved for storage of red blood cells for how many days?  
 (A) 21  (B) 42  
 (C) 35 (D) 7
050. Frozen and thawed RBCs processed in an open system can be stored for how many days/hours?  
 (A) 3 days (B) 6 hours  
 (C) 24 hours (D) 15 days
051. Nucleic acid amplification testing is used to test donor blood for which of the following infectious diseases?  
 (A) Hepatitis C virus (B) Human immunodeficiency virus  
 (C) West Nile virus  (D) All of the above
052. Prestorage pooled platelets can be stored for:  
 (A) 4 hours. (B) 24 hours.  
 (C) 5 days. (D) 7 days.
053. Restriction fragment length polymorphism (RFLP) is based on the use of the enzymes:  
 (A) Reverse transcriptases  (B) Bacterial endonucleases  
 (C) DNA polymerases (D) RNA polymerases
054. Plasmids are:  
 (A) Vectors used for molecular cloning (B) Antibiotics  
 (C) Enzymes (D) Part of chromosomes

055. DNA sequencing:
- (A) Is more difficult than peptide sequencing
  - (B) Requires the use of RNA polymerase
  - (C) Can never be automated
  - (D) Is an enzymatic in vitro reaction
056. The most common anticoagulant used for apheresis procedures is:
- (A) Heparin.
  - (B) Sodium fluoride.
  - (C) Warfarin.
  - (D) Citrate.
057. The replacement fluid indicated during plasma exchange for TTP is:
- (A) Normal (0.9%) saline.
  - (B) Hydroxyethyl starch (HES).
  - (C) FFP.
  - (D) Albumin (human) 5%.
058. Which of the following blood pressures is unacceptable for donation?
- (A) 120/70
  - (B) 145/90
  - (C) 190/60
  - (D) 110/80
059. Cellular components for transfusion that may be collected by apheresis include:
- (A) Platelet concentrates
  - (B) Granulocyte concentrates
  - (C) Hematopoietic progenitor cells
  - (D) All of the above
060. AABB standards require that granulocyte components collected by apheresis contain a minimum of \_\_\_\_\_ granulocytes in about 75% of units tested.
- (A)  $1.0 \times 10^{10}$
  - (B)  $5.5 \times 10^{10}$
  - (C)  $3.0 \times 10^{10}$
  - (D)  $1.5 \times 10^{10}$
061. Which of the following is not an action of the chemicals contained in common whole blood anticoagulants?
- (A) Chelates the calcium to prevent blood from clotting
  - (B) Maintains the pH level at optimal levels
  - (C) Provides a substrate for ATP generation
  - (D) Prevents ATP production to increase viability of red cells
062. Leukocyte-reduced red cells can be prepared by the following methods:
- (A) In-line whole blood or red blood cell filter
  - (B) Sterile connected leukoreduction filter
  - (C) Bedside filter
  - (D) All of the above
063. Complement activation in vitro
- (A) does not result in observable hemolysis
  - (B) is possible if EDTA plasma is used
  - (C) is not observed in EDTA plasma
  - (D) is detected only if polyspecific antihuman globulin is used

064. The immune system has evolved to
- (A) Protect microorganisms from the sun's rays
  - (B) Protect the host against infection and prevent reinfection through generation of memory
  - (C) Prevent us from paying higher taxes
  - (D) Protect a host's memory and generate infection
065. Mean cell volume (MCV) is calculated using the following formula:
- (A)  $(\text{Hgb} \div \text{RBC}) \times 10$
  - (B)  $(\text{Hct} \div \text{RBC}) \times 10$
  - (C)  $(\text{Hct} \div \text{Hb}) \times 100$
  - (D)  $(\text{Hgb} \div \text{RBC}) \times 100$
066. What term describes the change in shape of erythrocytes seen on a Wright's-stained peripheral blood smear?
- (A) Poikilocytosis
  - (B) Anisocytosis
  - (C) Hypochromia
  - (D) Polychromasia
067. A Miller disk is an ocular device used to facilitate counting of:
- (A) Platelets
  - (B) Reticulocytes
  - (C) Sickle cells
  - (D) Nucleated red blood cells (NRBCs)
068. SITUATION: RBC indices obtained on an anemic patient are as follows: MCV 88  $\mu\text{m}^3$  (fL); MCH 30 pg; MCHC 34% (.340). The RBCs on the peripheral smear would appear:
- (A) Microcytic, hypochromic
  - (B) Microcytic, normochromic
  - (C) Normocytic, normochromic
  - (D) Normocytic, hypochromic
069. What is the major type of leukocyte seen in the peripheral smear of a patient with aplastic anemia?
- (A) Segmented neutrophil
  - (B) Lymphocyte
  - (C) Monocyte
  - (D) Eosinophil
070. Hemolytic uremic syndrome (HUS) is characterized by all of the following *except*:
- (A) Hemorrhage
  - (B) Thrombocytopenia
  - (C) Hemoglobinuria
  - (D) Reticulocytopenia
071. An autohemolysis test is positive in all the following conditions *except*:
- (A) Glucose-6-phosphate dehydrogenase (G6PD) deficiency
  - (B) Hereditary spherocytosis (HS)
  - (C) Pyruvate kinase (PK) deficiency
  - (D) Paroxysmal nocturnal hemoglobinuria (PNH)
072. "Bite cells" are usually seen in patients with:
- (A) Rh null trait
  - (B) Chronic granulomatous disease
  - (C) G6PD deficiency
  - (D) PK deficiency
073. Which of the following is a common finding in aplastic anemia?
- (A) A monoclonal disorder
  - (B) Tumor infiltration
  - (C) Peripheral blood pancytopenia
  - (D) Defective DNA synthesis



085. Which of the following is a characteristic of classic hemophilia A?  
 (A) Prolonged bleeding time (B) Autosomal recessive inheritance  
 (C) Mild to severe bleeding episodes (D) Prolonged PT
086. Refer to the following results:  
 PT = prolonged  
 APTT = prolonged  
 Platelet count = decreased  
 Which disorder may be indicated?  
 (A) Factor VIII deficiency (B) von Willebrand's disease  
 (C) DIC (D) Factor IX deficiency
087. The most suitable product for treatment of factor VIII deficiency is:  
 (A) Fresh frozen plasma  (B) Factor VIII concentrate  
 (C) Prothrombin complex concentrate (D) Factor V Leiden
088. Fibrin monomers are increased in which of the following conditions?  
 (A) Primary fibrinolysis  (B) DIC  
 (C) Factor VIII deficiency (D) Fibrinogen deficiency
089. From the following, identify a specific component of the adaptive immune system that is formed in response to antigenic stimulation:  
 (A) Lysozyme (B) Complement  
 (C) Commensal organisms (D) Immunoglobulin
090. Which T cell expresses the CD8 marker and acts specifically to kill tumors or virally infected cells?  
 (A) Helper T (B) T suppressor  
 (C) T cytotoxic (D) T inducer/suppressor
091. What is the name of the process by which phagocytic cells are attracted to a substance such as a bacterial peptide?  
 (A) Diapedesis (B) Degranulation  
 (C) Chemotaxis (D) Phagotaxis
092. Which immunoglobulin appears in highest titer in the secondary response?  
 (A) IgG (B) IgM  
 (C) IgA (D) IgE
093. Which immunoglobulin can cross the placenta?  
 (A) IgG (B) IgM  
 (C) IgA (D) IgE
094. The detection of precipitation reactions depends on the presence of optimal proportions of antigen and antibody. A patient's sample contains a large amount of antibody, but the reaction in a test system containing antigen is negative. What has happened?  
 (A) Performance error (B) Low specificity  
 (C) A shift in the zone of equivalence (D) Prozone phenomenon

095. What outcome results from improper washing of a tube or well after adding the enzyme-antibody conjugate in an ELISA system?
- (A) Result will be falsely decreased                       (B) Result will be falsely increased  
(C) Result will be unaffected                              (D) Result is impossible to determine
096. Which test is most likely to be positive in the tertiary stage of syphilis?
- (A) FTA-ABS    (B) RPR  
(C) VDRL    (D) Reagin screen test (RST)
097. Which tests are considered screening tests for HIV?
- (A) ELISA, 4th generation, and rapid antibody tests  
(B) Immunofluorescence, Western blot, Radioimmuno-precipitation assay  
(C) Culture, antigen capture assay, DNA amplification  
(D) Reverse transcriptase and messenger RNA (mRNA) assay
098. Which method is used to test for HIV infection in infants who are born to HIV-positive mothers?
- (A) ELISA    (B) Western blot test  
 (C) Polymerase chain reaction                              (D) Viral culture
099. What constitutes a diagnosis of viral hepatitis?
- (A) Abnormal test results for liver enzymes  
(B) Clinical signs and symptoms  
(C) Positive results for hepatitis markers  
 (D) All of the above
100. A patient who is blood group O is accidentally transfused with group A blood and develops a reaction during the transfusion. What antibody is involved in this type II reaction?
- (A) IgM    (B) IgE  
(C) IgG and IgE    (D) IgG
101. What immune elements are involved in a positive skin test for tuberculosis?
- (A) IgE antibodies     (B) T cells and macrophages  
(C) NK cells and IgG antibody                              (D) B cells and IgM antibody
102. A patient received 5 units of fresh frozen plasma (FFP) and developed a severe anaphylactic reaction. He has a history of respiratory and gastrointestinal infections. Post-transfusion studies showed all 5 units to be ABO-compatible. What immunologic test would help to determine the cause of this transfusion reaction?
- (A) Complement levels, particularly C3 and C4  
(B) Flow cytometry for T-cell counts  
 (C) Measurement of immunoglobulins  
(D) NBT test for phagocytic function
103. If anti-K reacts 3+ with a donor cell with a genotype KK and 2+ with a Kk cell, the antibody is demonstrating:
- (A) Dosage    (B) Linkage disequilibrium  
(C) Homozygosity    (D) Heterozygosity

104. Which genotype is heterozygous for C?  
 (A) DCE/dce (B) DCE/DCE  
 (C) Dce/dce (D) DCE/dCe
105. Which of the following enhancement mediums decreases the zeta potential, allowing antibody and antigen to come closer together?  
 (A) LISS (B) Polyethylene glycol  
 (C) Polybrene (D) ZZAP
106. What antibodies are formed by a Bombay individual?  
 (A) Anti-A and anti-B (B) Anti-H  
 (C) Anti-A,B  (D) Anti-A, B, and H
107. Which blood group has the least amount of H antigen?  
 (A) A1B (B) A2  
 (C) B (D) A1
108. What should be done if all forward and reverse ABO results are negative?  
 (A) Perform additional testing such as typing with anti-A1 lectin and anti-A, B  
 (B) Incubate at 22°C or 4°C to enhance weak expression  
 (C) Repeat the test with new reagents  
 (D) Run an antibody identification panel
109. What reaction would be the same for an A1 and an A2 person?  
 (A) Positive reaction with anti-A1 lectin (B) Positive reaction with A1 cells  
 (C) Equal reaction with anti-H  (D) Positive reaction with anti-A,B
110. A female patient at 28 weeks' gestation yields the following results:  
 Patient cells: Anti-A, 3+ Anti-B, 4+  
 Patient serum: A1 cells, neg B cells, 1+ O cells, 1+  
 Which of the following could be causing the ABO discrepancy?  
 (A) Hypogammaglobulinemia  (B) Alloantibody in patient serum  
 (C) Acquired B  (D) Weak subgroup
111. Why is testing for Rh antigens and antibodies different from ABO testing?  
 (A) ABO reactions are primarily due to IgM antibodies and usually occur at room temperature; Rh antibodies are IgG and agglutination usually requires a 37°C incubation and enhancement media  
 (B) ABO antigens are attached to receptors on the outside of the red cell and do not require any special enhancement for testing; Rh antigens are loosely attached to the red cell membrane and require enhancement for detection  
 (C) Both ABO and Rh antigens and antibodies have similar structures, but Rh antibodies are configured so that special techniques are needed to facilitate binding to Rh antigens  
 (D) There is no difference in ABO and Rh testing; both may be conducted at room temperature with no special enhancement needed for reaction Blood bank/Apply knowledge of fundamental biological characteristics/Rh system/1
112. What techniques are necessary for weak D testing?  
 (A) Saline + 22°C incubation (B) Albumin or LISS + 37°C incubation  
 (C) Saline + 37°C incubation  (D) 37°C incubation + IAT

113. A patient types as AB and appears to be Rh positive on slide typing. What additional tests should be performed for tube typing?
- (A) Rh negative control (B) Direct antiglobulin test (DAT)  
 (C) Low-protein Rh antisera (D) No additional testing is needed
114. Anti-M is sometimes found with reactivity detected at the immediate spin (IS) phase that persists in strength to the IAT phase. What is the main testing problem with a strong anti-M?
- (A) Anti-M may not allow detection of a clinically significant antibody  
 (B) Compatible blood may not be found for patient with a strongly reacting anti-M  
 (C) The anti-M cannot be removed from the serum  
 (D) The anti-M may react with the patient's own cells, causing a positive autocontrol
115. Which antibody is frequently seen in patients with warm autoimmune hemolytic anemia?
- (A) Anti-Jka (B) Anti-e  
 (C) Anti-K (D) Anti-Fyb
116. Which antibody would not be detected by group O screening cells?
- (A) Anti-N (B) Anti-A1  
 (C) Anti-Dia (D) Anti-k
117. SITUATION: An emergency trauma patient requires transfusion. Six units of blood are ordered stat. There is no time to draw a patient sample. O-negative blood is released. When will compatibility testing be performed?
- (A) Compatibility testing must be performed before blood is issued  
 (B) Compatibility testing will be performed when a patient sample is available  
 (C) Compatibility testing may be performed immediately using donor serum  
 (D) Compatibility testing is not necessary when blood is released in emergency situations
118. Can crossmatching be performed on October 14<sup>th</sup> using a patient sample drawn on October 12<sup>th</sup>?
- (A) Yes, a new sample would not be needed  
 (B) Yes, but only if the previous sample has no alloantibodies  
 (C) No, a new sample is needed because the 2-day limit has expired  
 (D) No, a new sample is needed for each testing
119. A major crossmatch and screening cells are 2+ at IS, 1+ at 37°C, and negative at the IAT phase. Identify the most likely problem.
- (A) Combination of antibodies (B) Cold alloantibody  
 (C) Rouleaux (D) Test error
120. Which of the following comprises an abbreviated crossmatch?
- (A) ABO, Rh, and antibody screen (B) ABO, Rh, antibody screen, IS crossmatch  
 (C) Type and screen (D) ABO, Rh, IS crossmatch

121. A patient had a transfusion reaction to packed red blood cells. The medical laboratory scientist began the laboratory investigation of the transfusion reaction by assembling pre- and post-transfusion specimens and all paperwork and computer printouts. What should he do next?
- (A) Perform a DAT on the post-transfusion sample  
 (B) Check for a clerical error(s)  
 (C) Repeat ABO and Rh typing of patient and donor unit  
 (D) Perform an antibody screen on the post- transfusion sample
122. Which type of transfusion reaction occurs in about 1% of all transfusions, results in a temperature rise of 1°C or higher, is associated with blood component transfusion, and is not related to the patient's medical condition?
- (A) Immediate hemolytic (B) Delayed hemolytic  
 (C) Febrile non hemolytic reaction (D) Transfusion-related acute lung injury
123. Which of the following is true regarding apheresis platelets?
- (A) The minimum platelet count must be  $3.0 \times 10^{11}$ , pH must be  $\geq 6.0$   
 (B) The minimum platelet count must be  $3.0 \times 10^{10}$ , pH must be  $\leq 6.2$   
 (C) The minimum platelet count must be  $3.0 \times 10^{11}$ , pH must be  $\geq 6.2$   
 (D) The minimum platelet count must be  $5.5 \times 10^{10}$ , pH must be  $\leq 6.0$
124. What should be done if a noticeable clot is found in an RBC unit?
- (A) Issue the unit; the blood will be filtered  
 (B) Issue the unit; note the presence of a clot on the release form  
 (C) Filter the unit in the blood bank before issue  
 (D) Do not issue the unit
125. What is a special condition for the storage of platelets?
- (A) Room temperature, 20°C–24°C  
 (B) No other components may be stored with platelets  
 (C) Platelets must be stored upright in separate containers  
 (D) Platelets require constant agitation at 20°C–24°C
126. What is the expiration of cryoprecipitate once pooled?
- (A) 4 hours (B) 6 hours  
 (C) 8 hours (D) 24 hours
127. SITUATION: A cancer patient recently developed a severe infection. The patient's hemoglobin is 8 g/dL owing to chemotherapy with a drug known to cause bone marrow depression and immunodeficiency. Which blood products are indicated for this patient?
- (A) Liquid plasma and cryoprecipitate  
 (B) Crossmatched platelets and washed RBCs  
 (C) Factor IX concentrates and FFP  
 (D) Irradiated RBCs, platelets, and granulocytes
128. Polyspecific AHG reagent contains:
- (A) Anti-IgG. (B) Anti-IgG and anti-IgM.  
 (C) Anti-IgG and anti-C3d. (D) Anti-C3d.

129. After the addition of IgG-coated RBCs (check cells) to a negative AHG reaction during an antibody screen, a negative result is observed. Which of the following is a correct interpretation?
- (A) The antibody screen is negative.       (B) The antibody screen needs to be repeated.  
(C) The saline washings were adequate.      (D) Reactive AHG reagent was added.
130. A positive DAT may be found in which of the following situations?
- (A) A weak D-positive patient      (B) A patient with anti-K  
 (C) HDFN      (D) An incompatible crossmatch
131. Irradiation of blood is performed to prevent?
- (A) Febrile nonhemolytic transfusion reaction  
(B) Delayed hemolytic transfusion reaction  
 (C) Transfusion-associated graft-versus-host disease  
(D) Transfusion-associated circulatory overload
132. TRALI presents with the following symptoms:
- (A) Respiratory distress      (B) Severe hypoxemia and hypotension  
(C) Fever       (D) All of the above
133. Which of the following is characteristic of iron overload?
- (A) Delayed, nonimmune complication      (B) Chelating agents are used  
(C) Multiorgan damage may occur       (D) All of the above
134. Middle cerebral artery-peak systolic velocity is used to:
- (A) Measure bilirubin.      (B) Determine fetal blood type.  
(C) Determine change in optical density.       (D) Assess for anemia.
135. ABO HDFN is usually mild because:
- (A) ABO antigens are poorly developed in the fetus.  
(B) ABO antibodies prevent the disease.  
(C) ABO antibodies readily cross the placenta.  
(D) ABO incompatibility is rare.
136. Which is true regarding compatibility testing for the infant younger than 4 months old?
- (A) A DAT is required.  
 (B) A crossmatch is not needed with the infant's blood when unexpected antibodies are present.  
(C) Maternal serum cannot be used for antibody detection.  
(D) To determine the infant's ABO group, RBCs must be tested with reagent anti-A, anti-B, and anti-A,B.
137. A nurse just called to request additional RBC units for a patient for whom you performed compatibility testing 4 days ago. She would like you to use the original specimen, as you keep it for 7 days anyway. Your most appropriate course of action would be to:
- (A) Check to see if there is enough of the original specimen.  
(B) Perform the compatibility testing on the original specimen.  
(C) Request more information in case the patient has developed a clinically significant unexpected antibody.  
 (D) Indicate that a new specimen is necessary because the patient has been recently transfused.

138. Optimum temperature for IAT test is:
- (A) 25 degree C (B) 4 degree C  
 (C) 37 degree C (D) 40 degree C
139. Which of the following involves hemolysis of RBCs through removal by the reticuloendothelial system?
- (A) Extravascular hemolysis (B) Intravascular hemolysis  
 (C) Anaphylaxis (D) None of the above
140. The red cell component storage lesion may show changes with all of the following except
- (A) Changes in the shape of the red cell  
 (B) Decrease in extracellular potassium  
 (C) Changes in oxygen-carrying capacity  
 (D) Possible changes in clinical outcome in some patients
141. What is the first step when a transfusion reaction is suspected?
- (A) Contact the blood bank and attending physician  
 (B) Assess for symptoms of acute hemolytic transfusion reaction  
 (C) Immediately collect a blood sample for crossmatch verification  
 (D) Stop the transfusion
142. In HDFN, the greatest risk to the fetus prior to birth is due to
- (A) Anemia (B) Hyperbilirubinemia  
 (C) An enlarged head (D) Bleeding
143. The most common method of determining fetal anemia is
- (A) Amniotic fluid analysis (B) Cordocentesis  
 (C) Middle cerebral artery Doppler (D) Analysis of maternal serum
144. Since mapping of the human genome, the theory of Rh inheritance is based on
- (A) One gene – Rh  (B) Two genes – RHD and RHCE  
 (C) Three genes – D, C\_c, and E\_e (D) Five genes – D, C, c, E, and e
145. Cellular blood components for infants who have had an intrauterine transfusion are irradiated to prevent
- (A) Sickle cell formation (B) CMV transmission  
 (C) Graft-versus-host disease (D) High potassium in the product
146. In cold agglutinin syndrome, the DAT is usually positive for:
- (A) C3 only (B) IgG only  
 (C) IgG plus C3 (D) neither IgG nor C3
147. A child with clinical signs of hemolytic anemia was admitted to the emergency room. He had a viral infection last week and his mother noticed that his urine was red. The DAT is positive with anti-C3 only and the antibody detection test was negative. Which of the following is a possible diagnosis?
- (A) WAIHA (B) CAS  
 (C) PCH (D) None of the above

148. A patient is suspected of having hemolytic anemia due to a drug that has not been previously described as causing DIIHA. Drug-treated RBCs are prepared in the laboratory and tested with the patient's serum and an eluate from the patient's RBCs. Which of the following is not true of results with drug-treated RBCs?
- (A) Nonreactive results with the patient's samples proves that no drug antibody is present
  - (B) Antiglobulin test reactivity with all normal sera indicates the possibility of non immunologic protein adsorption
  - (C) Direct agglutination after the 37C incubation with some normal sera indicates the possibility of IgM antibodies to the drug (or a structurally similar chemical)
  - (D) Reactivity of the patient's serum and eluate and nonreactive results with normal sera indicates the presence of an antibody to the drug
149. The major immunoglobulin class(es) of anti-B in a group A individual is (are):
- (A) IgM.
  - (B) IgG.
  - (C) IgM and IgG.
  - (D) IgM and IgA.
150. What are the possible ABO phenotypes of the offspring from the mating of a group A to a group B individual?
- (A) O, A, B
  - (B) A, B
  - (C) A, B, AB
  - (D) O, A, B, AB
151. What ABH substance(s) would be found in the saliva of a group B secretor?
- (A) H
  - (B) H and A
  - (C) H and B
  - (D) H, A, and B
152. The enzyme responsible for conferring H activity on red cell membrane is
- (A) N-acetyl galactosaminyl transferase
  - (B) D-galactosyl transferase
  - (C) L-fucosyl transferase
  - (D) Glucosyltransferase
153. Solid phase red cell adherence technique has the following advantages over other techniques except
- (A) Versatility
  - (B) More specific as it is only mean to pick up the clinically significant IgG antibodies
  - (C) Less sensitive specially for the detection of Anti-Jka and Jkb antibodies
  - (D) Platelet antibody screening and platelet crossmatch available
154. The advantage of monoclonal antigens over polyclonal antigens is all except
- (A) Monoclonal reagents are specific
  - (B) No non specific antibodies are present in monoclonal antigens
  - (C) The batch to batch consistency of monoclonal reagents is more
  - (D) Cross reactivity
155. Which of the following statements is false
- (A) Rh antigens are well developed at birth
  - (B) RH gene is present on chromosome one
  - (C) Rh D is the most antigenic
  - (D) Weakened expression of D antigen is called partial D

156. Rh antibodies react best at what temperature (°C)?  
 (A) 15 (B) 18  
 (C) 22 (D) 37
157. What do Rh null cells lack?  
 (A) Lewis antigens (B) Normal oxygen-carrying capacity  
 (C) Rh antigens (D) Hemoglobin
158. Which Rh phenotype has the strongest expression of D?  
 (A) DCe/ce (B) DCe/DCe  
 (C) DcE/DcE (D) D-
159. If a patient who is R1R1 is transfused with RBCs that are Ror, which antibody is he most likely to produce?  
 (A) Anti-D (B) Anti-c  
 (C) Anti-e (D) Anti-G
160. Rh gene is present on chromosome  
 (A) 1 (B) 4  
 (C) 9 (D) 19
161. Which of the following methods may be employed to remove IgG antibodies that are coating a patient's red blood cells?  
 (A) Adsorption (B) Elution  
 (C) Neutralization (D) Titration
162. The recommended minimum number of CD34+ cells required in an HPC-apheresis collection to ensure timely engraftment is:  
 (A)  $2 \times 10^2$  CD34+ cells/kg (B)  $2 \times 10^4$  CD34+ cells/kg  
 (C)  $2 \times 10^6$  CD34+ cells/kg (D)  $2 \times 10^8$  CD34+ cells/kg
163. An A patient received an HPC transplant from a B donor. What type of ABO mismatch does this represent?  
 (A) Major (B) Minor  
 (C) Bidirectional (D) Any of the above
164. Which type of HSCT can be performed within a relatively short period of time?  
 (A) Matched unrelated (B) Cord blood  
 (C) Autologous (D) HLA haploidentical
165. Antibodies that exhibit dosage phenomenon are  
 (A) Rh (except D) (B) Kidd  
 (C) Duffy (D) All
166. The use of proteolytic enzymes provides enhanced antibody reactivity to:  
 1. Rh 2. Kidd 3. Duffy 4. P1 5. I 6. Lewis 7. MNS  
 (A) 1, 2, 4, 5, 6 (B) 1, 2, 3, 4, 5  
 (C) 1, 3, 4, 5, 7 (D) 2, 3, 4, 5, 6

167. With cold-reactive autoantibodies, the protein coating the patient's cells and detected in the DAT is:
- (A) C3.  (B) IgG.  
 (C) C4.  (D) IgM.
168. Which antibody specificity is not required in antibody detection tests?
- (A) K  (B) Cw  
 (C) Fya  (D) S
169. A patient's antibody screen was positive and an anti-c was identified. Antiglobulin crossmatches were performed with c-negative units and 1 of the 6 units was incompatible. What should be performed to resolve the incompatible crossmatch?
- (A) Retype the incompatible unit for the c antigen  
 (B) Perform a DAT on the incompatible unit  
 (C) Perform additional identification testing to include low-specificity antigens  
 (D) all of the above
170. A patient with sickle cell disease is B-positive with a positive antibody screen. The antibody identified is anti-D, and the autocontrol is negative. What is a possible explanation?
- (A) The patient is weak D-positive  
 (B) Autoantibody is present  
 (C) Patient possesses the partial D phenotype  
 (D) The patient has a positive DAT
171. Alternate forms of a gene that can occur at a single chromosome locus are referred to as
- (A) Traits  (B) Alleles  
 (C) Chromosomes  (D) Phenotypes
172. A PCR-based assay:
- (A) Has limitations  
 (B) Gives a prediction of a blood group  
 (C) Amplifies a specific sequence of DNA  
 (D) All of the above
173. Which of the following statements is true about antigen testing in a recently multiply-transfused patient?
- (A) Antigen typing by routine hemagglutination methods gives accurate results.  
 (B) The transfused donor RBCs can be easily distinguished from the patient's own RBCs.  
 (C) DNA analysis is an effective tool for antigen prediction.  
 (D) Antigen typing is not required to manage these patients.
174. A crossmatch label should include:
- (A) The crossmatch interpretation  
 (B) The donor unit number  
 (C) The name and identification of the recipient  
 (D) All of the above

175. The H antigen is found in highest concentration on what type of red blood cell?  
 (A) Group A (B) Group B  
 (C) Group AB (D) Group O
176. The immunodominant sugar associated with the A antigen is:  
 (A) L-fucose (B) N-acetylgalactosamine  
 (C) D-galactose (D) D-glucose
177. The gene that controls the presence or absence of the H substance in body secretions is the:  
 (A) H gene (B) Se gene  
 (C) h gene (D) B gene
178. Group A2 constitutes approximately what percentage of group A individuals?  
 (A) 2% (B) 20%  
 (C) 40% (D) 80%
179. The use of R to denote the presence of “D” in Rh nomenclature is an example of which terminology?  
 (A) Fisher–Race (B) Wiener  
 (C) ISBT (D) None of the above
180. Which of the following is a carbohydrate antigen?  
 (A) Jka (B) Leb  
 (C) AnWj (D) GIL
181. Which of the following antigens are destroyed by ficin?  
 (A) M (B) Jkb  
 (C) Lea (D) Doa
182. Inheritance of which of the following genes determines Lewis antigen expression?  
 (A) FUT1 (B) FUT2  
 (C) FUT2/FUT3 (D) FUT3
183. Individuals with PNH will not express which of the following antigens?  
 (A) MNS (B) Duffy  
 (C) Yt (D) Ok
184. Coding regions of genes are called  
 (A) Exons (B) Introns  
 (C) Polyons (D) None of the above
185. Most immunologic refractoriness to platelets results from antibodies to:  
 (A) HLA class I antigens (B) HLA class II antigens  
 (C) HLA class III antigens (D) ABO antigens
186. “Leap frog” technique relate to the context of  
 (A) Apheresis plasma collection (B) Autologous transfusion  
 (C) Irradiation of blood products (D) Pathogen inactivation of blood products

187. Recommended temperature for storage of cryopreserved umbilical cord blood cells  
 (A)  $\leq -150^{\circ}\text{C}$  (B)  $\leq -210^{\circ}\text{C}$   
 (C)  $\leq 100^{\circ}\text{C}$  (D)  $\leq -80^{\circ}\text{C}$
188. Maximum volume of blood collected from a blood donor should not exceed  
 (A) 10.5 ml/kg body wt (B) 11 ml/kg body wt  
 (C) 12.5 ml/kg body wt (D) 12 ml/kg body wt
189. During preparative regimen in a bidirectional incompatible bone marrow transplant following blood group plasma can only be transfused  
 (A) AB blood group (B) Donor blood group  
 (C) Recipient blood group (D) O blood group
190. Biochemical composition of RBC membrane is  
 (A) 52% Protein, 40% Lipid, 8% Carbohydrate  
 (B) 40% Protein, 52% Lipid, 8% Carbohydrate  
 (C) 8% Protein, 52% Lipid, 52% Carbohydrate  
 (D) None of the above
191. First blood bank in India was established at  
 (A) Delhi  (B) Calcutta  
 (C) Pune (D) Bombay
192. Percentage of Red cell suspension used in column agglutination technique is  
 (A) 1% (B) 5%  
 (C) 10% (D) 40%
193. ABO/Rh information should be mention on which quadrant of blood product lable  
 (A) Upper right quadrant (B) Upper left quadrant  
 (C) Lower right quadrant (D) Lower left quadrant
194. Disadvantage of monoclonal reagent over polyclonal reagent  
 (A) Specificity (B) Potency  
 (C) Cross reactivity (D) All of the above
195. The main purpose of research in education is to \_\_\_\_\_  
 (A) Help in the personal growth of an individual  
 (B) Help the candidate become an eminent educationist  
 (C) Increase job prospects of an individual  
 (D) Increase social status of an individual
196. Sample size depends on  
 (A) Type of problem investigated (B) Resources available  
 (C) Required precision  (D) All of the above
197. When data is classified according to the magnitude it is called  
 (A) Chronological (B) Qualitative  
 (C) Quantitative (D) Continuous

