

# AYK

## PROVISIONAL ANSWER KEY (CBRT)

Name of the post	Professor, Immuno Haematology and Blood Transfusion, GSS, Class-1
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THE LINK FOR ONLINE OBJECTION SYSTEM WILL START FROM 09-09-2021; 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 Positional central tendency?  
(A) Arithmetic Mean (B) Geometric Mean  
(C) Harmonic Mean (D) Median
002. The value of correlation coefficient will vary from \_\_\_\_\_  
(A) 0 to 1 (B) -1 to +1  
(C)  $-\infty$  to  $+\infty$  (D) -1 to 0
003. The relationship between more than two variables is said to be \_\_\_\_\_  
(A) Simple Correlation (B) Random Correlation  
(C) Partial Correlation (D) Multiple correlation
004. In which of the following year the Transplantation of Human Organs Act was passed by Government of India?  
(A) 1994 (B) 1996  
(C) 2000 (D) 2002
005. Currently, which of the following does the AABB consider to be the most significant infectious threat from transfusion?  
(A) Bacterial contamination (B) CMV  
(C) Hepatitis (D) HIV
006. All of the following statements are true concerning WNV (West Nile Virus) except:  
(A) 1 in 150 infections results in severe neurologic disease.  
(B) Severe disease occurs most frequently in the over-50 age group.  
(C) Deaths occur more often in those over 65 years who present with encephalitis.  
(D) Fatalities occur in approximately 38% of infected individuals.
007. Fifth disease is caused by:  
(A) CMV (B) EBV  
(C) Parvovirus B19 (D) HTLV-II
008. Contribution of total cases of HIV by blood transfusion  
(A) >90% (B) 3-4%  
(C) 5-10% (D) < 1%
009. Leukoreduction assists in reducing the risk of transmission of the following viruses  
(A) Human T Lymphotropic virus (HTLV-1)  
(B) Human immunodeficiency Virus  
(C) Cytomegalovirus (CMV)  
(D) Human Herpes Virus 8 (HHV8)
010. Life of whole blood in ACD  
(A) 21 days (B) 28 days  
(C) 35 days (D) 42 days
011. Shelf life of Albumin at room temperature  
(A) 1 year (B) 3 year  
(C) 3 month (D) 5 years

012. A 25 year old LT history of needle prick injury and the source was HbsAg reactive. LT was not vaccinated for hepatitis B vaccine , what post exposure prophylaxis would you advise to him
- (A) HbsAg vaccination
  - (B) HbsAg vaccination + Antiviral Therapy
  - (C) HbsAg vaccination + hepatitis immunoglobulins
  - (D) Should be treated medically as Hepatitis b reactive case
013. The advantage of SOP is
- (A) It ensure safe blood transfusion to the patient
  - (B) It helps to monitor the performance of the task in a more effective way
  - (C) It standardize all staff member to do their job more effectively
  - (D) It standardize training of staff
014. Which blood group system is associated with resistance to *P. vivax* malaria?
- (A) P
  - (B) Kell
  - (C) Duffy
  - (D) Kidd
015. The proportion of CPDA1 required for a 300 ml of blood unit
- (A) 1:7
  - (B) 1:11
  - (C) 9:1
  - (D) 1:4
016. Which of the following statement is incorrect regarding NAT-PCR
- (A) Amplification product is c-DNA amplicon
  - (B) Ultracentrifugation is not required
  - (C) Risk of False negative results
  - (D) High risk of contamination in compare to TMA
017. Which of the following is an incomplete virus and is present only when hepatitis B infection is present?
- (A) Hepatitis A
  - (B) Hepatitis B
  - (C) Hepatitis C
  - (D) Hepatitis D
018. HIV is pathogenic for which of the following cells?
- (A) T4 cell
  - (B) T8 cell
  - (C) Monocytes
  - (D) Nerve cells
019. Cytomegalovirus-positive blood is dangerous for which of the following?
- (A) Pregnant women who are seronegative
  - (B) Immunosuppressed individuals
  - (C) Neonates
  - (D) All of the above
020. Which of the following organisms grows well in the cold and especially likes the iron-rich environment of stored blood?
- (A) Escherichia coli
  - (B) Hepatitis B virus
  - (C) Malarial organisms
  - (D) Yersinia enterocolitica

021. Lyme disease is spread by:  
(A) Mosquito (B) Tick  
(C) Water (D) None of the above
022. Which of the following screening method has dramatically reduced the likelihood of window period transmission?  
(A) Donor questioning (B) Implementation of NAT  
(C) Western blot testing (D) None of the above
023. Disadvantages of autologous transfusion is  
(A) Does not alter bacterial contamination  
(B) Does not alter risk of clerical error with ABO incompatibility  
(C) Wastage of blood if not transfused  
(D) All of the above
024. Massive transfusion is defined as:  
(A) Transfusion of whole blood equal to person's blood volume  
(B) Transfusion of 10 units of whole blood in 24 hrs  
(C) Replacement of > 50% of blood volume in 3-4 hrs in an adult  
(D) All of the above
025. Major complications arise due to Massive Transfusion are all, except  
(A) Hypothermia (B) Hypercalcemia  
(C) Hypokalemia (D) Acidosis
026. Which of following is not a complication of Blood Transfusion :-  
(A) Transmission of blood transmissible infections  
(B) Alloimmunization  
(C) Iron Overload  
(D) Hypoxia
027. Most common AIHA is  
(A) Warm AIHA (B) Cold agglutinin syndrome  
(C) Paroxysmal cold haemoglobinuria (D) Drug induced AIHA
028. G6PD deficiency, True is  
(A) X-Linked recessive disorder (B) X-Linked dominant disorder  
(C) Autosomal recessive disorder (D) Autosomal dominant disorder
029. Most common red cell enzyme deficient disorder is  
(A) G6PD deficiency (B) Pyruvate kinase deficiency  
(C) Phosphofructokinase deficiency (D) Aldolase deficiency
030. Which of following drug will cause haemolysis in G6PD deficient individual  
(A) Primaquine (B) Sulfonamides  
(C) Methylene blue (D) All of the above

031. In pre marriage counselling for haemophilia, carrier detection may be done using  
(A) Family history (B) Coagulation based assay  
(C) DNA testing (D) All of the above
032. Pharmacological agents used in blood sparing strategies  
(A) Desmopressin (B) Aprotinin  
(C) EACA (D) All of the above
033. NOT true about VIT. K  
(A) Fat soluble vitamin  
(B) Factor II, VII, IX, X are dependent factor  
(C) Deficiency may occur due to antibiotic and fat malabsorption  
(D) Vitamin K depletion causes decrease in PT
034. Outdated platelet application involves  
(A) Platelet derived microparticles (B) Infusible platelet membranes  
(C) Human platelet factor 4 (D) All of the above
035. Adequacy of Therapeutic Phlebotomy is assessed by  
(A) Hb = 12.5 gm/dl  
(B) Hct =33%  
(C) MCV decreased by 3% below pre- phlebotomy value  
(D) All of the above
036. Indication for 25% Albumin are all, except  
(A) Hypoproteinemia following burns and extensive surgery  
(B) Hypoproteinemia in malnutrition  
(C) Haemorrhagic shock  
(D) Replacement fluid in plasma exchange
037. True about Copper sulphate method for Hb estimation is  
(A) Method based on specific gravity  
(B) Indirectly measure Hb value  
(C) Standard solution have Specific gravity 1.052 to 1.055  
(D) All of the above
038. Which of the following is not involved in the acquired or adaptive immune response?  
(A) Phagocytosis  
(B) Production of antibody or complement  
(C) Induction of immunologic memory  
(D) Accelerated immune response upon subsequent exposure to antigen
039. Which of the following immunoglobulins is produced in the primary immune response?  
(A) IgA (B) IgE  
(C) IgG (D) IgM

040. Which of the following is known as the “membrane attack complex” in the classical complement pathway?
- (A) C1 (B) C3  
(C) C4, C2, C3 (D) C5b, C6, C7, C8, C9
041. Which of the following immunoglobulin classes is capable of crossing the placenta and causing hemolytic disease of the newborn?
- (A) IgA (B) IgE  
(C) IgG (D) IgM
042. Molecules that promote the uptake of bacteria for phagocytosis are:
- (A) Opsonins (B) Cytokines  
(C) Haptens (D) Isotypes
043. Which of the following terms refers to the net negative charge surrounding red blood cells?
- (A) Dielectric constant (B) Van der Waals forces  
(C) Hydrogen bonding (D) Zeta potential
044. Which of the following anticoagulant preservatives provides a storage time of 35 days at 1°C to 6°C for units of whole blood and prepared RBCs if an additive solution is not added?
- (A) ACD-A (B) CP2D  
(C) CPD (D) CPDA-1
045. What are the current storage time and storage temperature for platelet concentrates and apheresis platelet components?
- (A) 5 days at 1°C to 6°C (B) 5 days at 24°C to 27°C  
(C) 5 days at 20°C to 24°C (D) 7 days at 22°C to 24°C
046. Which of the following occurs during storage of red blood cells?
- (A) pH decreases (B) 2, 3-DPG increases  
(C) ATP increases (D) plasma K<sup>+</sup> decreases
047. The central dogma of molecular biology states that:
- (A) DNA is the genetic material (B) RNA is the genetic material  
(C) DNA is translated to mRNA (D) Proteins are transcribed from mRNA
048. The polymerase chain reaction (PCR):
- (A) Is carried out in vivo (B) Is used for peptide synthesis  
(C) Requires RNA polymerase (D) Is used for the amplification of DNA
049. Pre - seroconversion window period is defined as:-
- (A) Is the time when donors can be infected but do not yet test positive by serologic methods  
(B) May be narrowed by using molecular methods  
(C) Refers mainly to viral pathogens  
(D) All of the above

050. In plasma exchange, the therapeutic effectiveness is:
- (A) Greatest with the first plasma volume removed
  - (B) Affected by the type of replacement fluid used
  - (C) Enhanced if the unwanted antibody is IgG rather than IgM
  - (D) Independent of the use of concomitant immunosuppressive therapy
051. The most common adverse effect of plateletpheresis collection is:
- (A) Allergic reaction.
  - (B) Hepatitis.
  - (C) Hemolysis.
  - (D) Citrate effect.
052. The anticoagulant added to blood as it is removed from a donor or patient during an apheresis procedure acts by:
- (A) Binding calcium ions.
  - (B) Increasing intracellular potassium.
  - (C) Binding to antithrombin III.
  - (D) Inactivating factor V.
053. Peripheral blood stem cells are:
- (A) Responsible for phagocytosis of bacteria.
  - (B) Removed during erythrocytapheresis.
  - (C) Pluripotential hematopoietic precursors that circulate in the peripheral blood.
  - (D) Lymphocytes involved with the immune response.
054. The minimum hemoglobin concentration for an autologous donor is:
- (A) 11 g/dL
  - (B) 12 g/dL
  - (C) 12.5 g/dL
  - (D) 13 g/dL
055. To ensure traceability and trackability of a collected unit, a unique identifying number should be applied to:
- (A) Donor history record
  - (B) Primary collection bag
  - (C) All pilot tubes
  - (D) All of the above
056. Which of the following tests is not required with routine donor unit processing?
- (A) HBs Ag
  - (B) Serologic test for syphilis
  - (C) CMV
  - (D) ABO/Rh
057. Which of the following is required to help ensure a safe blood supply?
- (A) Written policies and procedures
  - (B) Documentation of all steps to ensure traceability and trackability
  - (C) Accurate and truthful information from a donor
  - (D) All of the above
058. "Surge" elutriation and the Latham bowl technology are used by which system?
- (A) COBE Spectra
  - (B) Haemonetics MCS
  - (C) Baxter CS-3000
  - (D) Fresenius AS 104
059. Therapeutic cytapheresis includes:
- (A) Thrombocytapheresis
  - (B) Leukapheresis
  - (C) Erythrocytapheresis
  - (D) All of the above

060. The collection of blood components through automated blood collections has an impact on:
- (A) Blood supply
  - (B) Donor recruiting process
  - (C) Blood center and transfusion services operations
  - (D) All of the above
061. Finished red blood cells may be transported at what temperature range?
- (A) 1°C to 10°C
  - (B) 2°C to 12°C
  - (C) 35°C to 37°C
  - (D) 20°C to 24°C
062. Frozen plasma products must be stored at what Temperature?
- (A) 1°C to 6°C
  - (B) -18°C or lower
  - (C) 20°C to 24°C
  - (D) 2°C to 8°C
063. Antibody is produced by
- (A) B cells differentiated into plasma cells
  - (B) T cells under the influence of thymosin
  - (C) B cells, T cells, and macrophages
  - (D) Pluripotent stem cell
064. The immunoglobulin molecules consists of
- (A) Two heavy and two light chains
  - (B) Identical heavy and identical light chains
  - (C) Four heavy and four light chains separated by disulfide bonds
  - (D) Carbohydrate sequences that confer subclass specificity in the variable regions
065. Hemagglutination in antigen–antibody reactions is influenced by
- (A) Ionic strength of the test system
  - (B) pH
  - (C) Incubation time
  - (D) All of the above
066. Most immune responses include
- (A) Both a cellular and humoral component
  - (B) Inflammation and specific acquired immunity
  - (C) Recognition of a non-self substance and cell activation
  - (D) All of the above
067. Insufficient centrifugation will result in:
- (A) A false increase in hematocrit (Hct) value
  - (B) A false decrease in Hct value
  - (C) No effect on Hct value
  - (D) All of these options, depending on the patient
068. Which of the following is the preferable site for bone marrow aspiration and biopsy in an adult?
- (A) Iliac crest
  - (B) Sternum
  - (C) Tibia
  - (D) Spinous processes of a vertebra

069. A 7.0-mL ethylenediamine tetraacetic acid (EDTA) tube is received in the laboratory containing only 2.0 mL of blood. If the laboratory is using manual techniques, which of the following tests will most likely be erroneous?
- (A) RBC count (B) Hemoglobin (Hgb)  
 (C) Hct (D) WBC count
070. What phagocytic cells produce lysozymes that are bacteriocidal?
- (A) Eosinophils (B) Lymphocytes  
 (C) Platelets (D) Neutrophils
071. A decreased osmotic fragility test would be associated with which of the following conditions?
- (A) Sick cell anemia (B) Hereditary spherocytosis  
 (C) Hemolytic disease of the newborn (D) Acquired hemolytic anemia
072. Which of the following erythrocyte inclusions can be visualized with supravital stain but cannot be detected on a Wright's-stained blood smear?
- (A) Basophilic stippling  (B) Heinz bodies  
 (C) Howell-Jolly bodies (D) Siderotic granules
073. What staining method is used most frequently to stain and manually count reticulocytes?
- (A) Immunofluorescence  (B) Supravital staining  
 (C) Romanowsky staining (D) Cytochemical staining
074. Using an electronic cell counter analyzer, an increased RDW should correlate with:
- (A) Spherocytosis (B) Leucocytosis  
 (C) Anisocytosis (D) Presence of NRBCs
075. Which of the following is considered a normal hemoglobin?
- (A) Carboxyhemoglobin (B) Methemoglobin  
 (C) Sulfhemoglobin (D) Deoxyhemoglobin
076. In which age group would 60% lymphocytes be a normal finding?
- (A) 6 months–2 years (B) 4–6 years  
 (C) 11–15 years (D) 40–60 years
077. Which of the following results on an automated differential suggests that a peripheral smear should be reviewed manually?
- (A) Segs = 70% (B) Band = 6%  
 (C) Mono = 15% (D) Eos = 2%
078. Which is the first stage of erythrocyte maturation in which the cytoplasm is pink due to the formation of hemoglobin?
- (A) Reticulocyte (B) Pronormoblast  
 (C) Basophilic normoblast (D) Polychromatic normoblast
079. Which of the following Hgb configurations is characteristic of Hgb H?
- (A)  $\gamma 4$  (B)  $\alpha 2\text{-}\gamma 2$   
 (C)  $\beta 4$  (D)  $\alpha 2\text{-}\gamma 2$

080. Which of the following organs is responsible for the “pitting process” for RBCs?  
(A) Liver (B) Spleen  
(C) Kidney (D) Lymph nodes
081. The anemia seen in sickle cell disease is usually:  
(A) Microcytic, normochromic (B) Microcytic, hypochromic  
(C) Normocytic, normochromic (D) Normocytic, hypochromic
082. In which of the following conditions will autosplenectomy most likely occur?  
(A) Thalassemia major (B) Hgb C disease  
(C) Hgb SC disease (D) Sickle cell disease
083. Which antibody is associated with paroxysmal cold hemoglobinuria (PCH)?  
(A) Anti-I (B) Anti-i  
(C) Anti-M (D) Anti-P
084. Autoimmune hemolytic anemia is best characterized by which of the following?  
(A) Increased levels of plasma C3 (B) Spherocytic red cells  
(C) Decreased osmotic fragility (D) Decreased unconjugated bilirubin
085. Congenital dyserythropoietic anemias (CDAs) are characterized by:  
(A) Bizarre multinucleated erythroblasts (B) Cytogenetic disorders  
(C) Megaloblastic erythropoiesis (D) An elevated M:E ratio
086. Microangiopathic hemolytic anemia is characterized by:  
(A) Target cells and Cabot rings  
(B) Toxic granulation and Dohle bodies  
(C) Pappenheimer bodies and basophilic stippling  
(D) Schistocytes and nucleated RBCs
087. Which of the following conditions may produce spherocytes in a peripheral smear?  
(A) Pelger–Huet anomaly (B) Pernicious anemia  
(C) Autoimmune hemolytic anemia (D) Sideroblastic anemia
088. The osmotic fragility test result in a patient with thalassemia major would most likely be:  
(A) Increased (B) Decreased  
(C) Normal (D) Decreased after incubation at 37°C
089. Iron deficiency anemia is characterized by:  
(A) Decreased plasma iron, decreased % saturation, increased total iron-binding capacity (TIBC)  
(B) Decreased plasma iron, decreased plasma ferritin, normal RBC porphyrin  
(C) Decreased plasma iron, decreased % saturation, decreased TIBC  
(D) Decreased plasma iron, increased % saturation, decreased TIBC
090. Which of the following is the primary Hgb in patients with thalassemia major?  
(A) Hgb D (B) Hgb A  
(C) Hgb C (D) Hgb F

091. Which anemia is characterized by a lack of intrinsic factor that prevents B12 absorption?  
(A) Tropical sprue (B) Transcobalamin deficiency  
(C) Blind loop syndrome (D) Pernicious anemia
092. A patient with a vitamin B12 anemia is given a high dosage of folate. Which of the following is expected as a result of this treatment?  
(A) An improvement in neurological problems  
(B) An improvement in hematological abnormalities  
(C) No expected improvement  
(D) Toxicity of the liver and kidneys
093. Which of the following disorders is associated with ineffective erythropoiesis?  
(A) G6PD deficiency (B) Liver disease  
(C) Hgb C disease (D) Megaloblastic anemia
094. Which of the following are most characteristic of the red cell indices associated with megaloblastic anemias?  
(A) MCV 99 fl, MCH 28 pg, MCHC 31%  
(B) MCV 62 fL, MCH 27 pg, MCHC 30%  
(C) MCV 125 fL, MCH 36 pg, MCHC 34%  
(D) MCV 78 fL, MCH 23 pg, MCHC 30%
095. The anticoagulant of choice for most routine coagulation studies is:  
(A) Sodium oxalate (B) Sodium citrate  
(C) Heparin (D) Ethylenediaminetetraacetic acid (EDTA)
096. Which results would be expected for the prothrombintime (PT) and activated partial thromboplastin time (APTT) in a patient with polycythemia?  
(A) Both prolonged (B) Both shortened  
(C) Normal PT, prolonged APTT (D) Both normal
097. What reagents are used in the PT test?  
(A) Thromboplastin and sodium chloride (B) Thromboplastin and potassium chloride  
(C) Thromboplastin and calcium (D) Actin and calcium chloride
098. Which of the following characterizes vitamin K?  
(A) It is required for biological activity of fibrinolysis  
(B) Its activity is enhanced by heparin therapy  
(C) It is required for carboxylation of glutamate residues of some coagulation factors  
(D) It is made by the endothelial cells
099. Which of the following clotting factors are measured by the APTT test?  
(A) II, VII, IX, X (B) VII, X, V, II, I  
(C) XII, XI, IX, VIII, X, V, II, I (D) XII, VII, X, V, II, I





119. The absorbance of a sample measured by ELISA is greater than the highest standard. What corrective action should be taken?
- (A) Extrapolate an estimated value from the highest reading
  - (B) Repeat the test using a standard of higher concentration
  - (C) Repeat the assay using one half the volume of the sample
  - (D) Dilute the test sample
120. Which of the following is the most sensitive test to detect congenital syphilis?
- (A) VDRL
  - (B) RPR
  - (C) Microhemagglutinin test for *T. pallidum* (MHA-TP)
  - (D) Polymerase chain reaction (PCR)
121. Which specimen is the sample of choice to evaluate latent or tertiary syphilis?
- (A) Serum sample
  - (B) Chancre fluid
  - (C) CSF
  - (D) Joint fluid
122. Which tests are considered confirmatory tests for HIV?
- (A) ELISA and rapid antibody tests
  - (B) Western blot test, HIC-1, 2 differentiation assays, and polymerase chain reaction
  - (C) Culture, antigen capture assay, polymerase chain reaction
  - (D) Reverse transcriptase and mRNA assay
123. Interpret the following results for HIV infection. ELISA: positive; repeat ELISA: negative; Western blot: no bands
- (A) Positive for HIV
  - (B) Negative for HIV
  - (C) Indeterminate
  - (D) Further testing needed
124. All of the following hepatitis viruses are spread through blood or blood products except:
- (A) Hepatitis A
  - (B) Hepatitis B
  - (C) Hepatitis C
  - (D) Hepatitis D
125. Which test would measure the coating of red cells by antibody as occurs in hemolytic transfusion reactions?
- (A) Indirect antiglobulin test (IAT)
  - (B) Direct antiglobulin test (DAT)
  - (C) ELISA
  - (D) Hemagglutination
126. Which of the following tests is used to detect circulating immune complexes in the serum of some patients with systemic autoimmune diseases such as rheumatoid arthritis?
- (A) Direct immunofluorescence
  - (B) Enzyme immunoassay
  - (C) Assay of cryoglobulins
  - (D) Indirect antiglobulin test
127. In the Hardy–Weinberg formula,  $p^2$  represents:
- (A) The heterozygous population of one allele
  - (B) The homozygous population of one allele
  - (C) The recessive allele
  - (D) The dominant allele

128. Why do IgM antibodies, such as those formed against the ABO antigens, have the ability to directly agglutinate red blood cells (RBCs) and cause visible agglutination?
- (A) IgM antibodies are larger molecules and have the ability to bind more antigen
  - (B) IgM antibodies tend to clump together more readily to bind more antigen
  - (C) IgM antibodies are found in greater concentrations than IgG antibodies
  - (D) IgM antibodies are not limited by subclass specificity
129. A patient's red cells forward as group O, serum agglutinates B cells (4+) only. Your next step would be:
- (A) Extend reverse typing for 15 minutes
  - (B) Perform an antibody screen including a room- temperature incubation
  - (C) Incubate washed red cells with anti-A1 and anti-A,B for 30 minutes at room temperature
  - (D) Test patient's red cells with Dolichos biflorus
130. What type RBCs can be transfused to an A2 person with anti-A1?
- (A) A only
  - (B) A or O
  - (C) B
  - (D) AB
131. A stem cell transplant patient was retyped when she was transferred from another hospital. What is the most likely cause of the following results?
- Patient cells: Anti-A neg, Anti-B 4+,  
Patient serum: A1 cells neg, B cells neg
- (A) Viral infection
  - (C) Immunodeficiency
  - (B) Alloantibodies
  - (D) Autoimmune hemolytic anemia
132. Which of the following results is most likely discrepant? Anti-A neg, Anti-B 4+, A1 cells neg, B cells neg.
- (A) Negative B cells
  - (C) Negative A1 cells
  - (B) Positive reaction with anti-B
  - (D) No problem with this typing
133. If a patient has a positive direct antiglobulin test, should you perform a weak D test on the cells?
- (A) No, the cells are already coated with antibody
  - (B) No, the cells are Rh null
  - (C) Yes, the immunoglobulin will not interfere with the test
  - (D) Yes, Rh reagents are enhanced in protein media
134. Which genotype usually shows the strongest reaction with anti-D?
- (A) DCE/DCE
  - (C) D-/D-
  - (B) Dce/dCe
  - (D) -CE/-ce
135. A patient tests positive for weak D but also appears to have anti-D in his serum. What may be the problem?
- (A) Mix up of samples or testing error
  - (B) Most weak D individuals make anti-D
  - (C) The problem could be due to a disease state
  - (D) A D mosaic may make antibodies to missing antigen parts

136. What does the genotype —/— represent in the Rh system?
- (A) Rh negative (B) D mosaic  
(C) Rh null (D) Total Rh
137. Which technology may report an Rh-weak D positive as Rh negative?
- (A) Gel System (B) Solid Phase  
(C) Tube Testing (D) None of these options
138. A technologist is having great difficulty resolving an antibody mixture. One of the antibodies is anti-Lea. This antibody is not clinically significant in this situation, but it needs to be removed to reveal the possible presence of an underlying antibody of clinical significance. What can be done?
- (A) Perform an enzyme panel  
(B) Neutralize the serum with saliva  
(C) Neutralize the serum with hydatid cyst fluid  
(D) Use DTT (dithiothreitol) to treat the panel cells
139. A patient is suspected of having paroxysmal cold hemoglobinuria (PCH). Which pattern of reactivity is characteristic of the Donath–Landsteiner antibody, which causes this condition?
- (A) The antibody attaches to RBCs at 4°C and causes hemolysis at 37°C  
(B) The antibody attaches to RBCs at 37°C and causes agglutination at the IAT phase  
(C) The antibody attaches to RBCs at 22°C and causes hemolysis at 37°C  
(D) The antibody attaches to RBCs and causes agglutination at the IAT phase
140. Which group of antibodies is commonly found as cold agglutinins?
- (A) Anti-K, anti-k, anti-Jsb (B) Anti-D, anti-e, anti-C  
(C) Anti-M, anti-N (D) Anti-Fya, anti-Fyb
141. The k (Cellano) antigen is a high-frequency antigen and is found on most red cells. How often would one expect to find the corresponding antibody?
- (A) Often, because it is a high frequency antibody  
(B) Rarely, because most individuals have the antigen and therefore would not develop the antibody  
(C) It depends upon the population, because certain racial and ethnic groups show a higher frequency of anti-k  
(D) Impossible to determine without consulting regional blood group antigen charts
142. An antibody screen is reactive at IAT phase of testing using a three-cell screen and the autocontrol is negative. What is a possible explanation for these results?
- (A) A cold alloantibody  
(B) High-frequency alloantibody or a mixture of alloantibodies  
(C) A warm autoantibody  
(D) A cold and warm alloantibody



152. Which of the following methods requires the use of check cells?  
 (A) LISS (B) Gel  
(C) Solid-phase (D) Enzyme-linked
153. Which factor can affect AHG testing, yet is uncontrollable in the lab?  
(A) Temperature (B)  Antibody affinity  
(C) Gravitational force in the centrifuge (D) Incubation time
154. Fatal transfusion reactions are mostly caused by?  
(A) Serologic errors (B) Improper storage of blood  
 (C) Clerical errors (D) Improper handling of the product
155. Early manifestation of an acute hemolytic transfusion reaction can be confused with?  
(A) Allergic reaction (B)  Febrile non hemolytic reaction  
(C) Anaphylactic shock (D) Sepsis
156. HDFN is characterized by:  
(A) IgM antibody.  
(B) Nearly always anti-D.  
 (C) Different RBC antigens between mother and father.  
(D) Antibody titer less than 32.
157. Pre-transfusion testing:  
(A) Proves that the donor's plasma is free of all irregular antibodies  
(B) Detects most irregular antibodies on the donor's RBCs that are reactive with patient's serum  
 (C) Detects most errors in the ABO groupings  
(D) Ensures complete safety of the transfusion
158. The purpose of the immediate spin crossmatch is to:  
(A) Ensure survival of transfused RBCs.  
 (B) Determine ABO compatibility between donor and recipient.  
(C) Detect cold-reacting unexpected antibodies.  
(D) Meet computer crossmatch requirements.
159. A crossmatch is positive at AHG phase with polyspecific AHG reagent but is negative with monospecific anti-IgG AHG reagent. This may indicate the antibody:  
(A) Is a weak anti-D.  
 (B) Is a clinically insignificant Lewis antibody.  
(C) Can cause decreased survival of transfused RBCs.  
(D) Is a Duffy antibody.
160. Which of the following does NOT occur days to weeks following transfusion?  
(A) Transfusion-associated graft-versus-host disease  
(B) Hemolytic transfusion reaction  
 (C) Transfusion-related acute lung injury  
(D) Post transfusion purpura

161. The most common type of HDFN is due to antibodies of the  
 (A) Kell system (B) Kidd system  
 (C) Lewis system (D) Rh system
162. Titration studies are most predictive of the severity of hemolytic disease  
 (A) During the first affected pregnancy  
 (B) When the antibody is anti-K  
 (C) When there is a one tube difference between the current and most recent past specimen  
 (D) If the titration is done using enzyme enhanced indicator cells
163. Thrombocytopenia is seen in all, except  
 (A) HSP (B) DIC  
 (C) TTP (D) Leukemia
164. Warm autoimmune hemolytic anemia is characterized most frequently by which of the following serologic patterns?  
 (A) DAT positive (IgG and C3) and a reactive eluate  
 (B) DAT positive (IgG only) and a nonreactive eluate  
 (C) DAT positive (C3 only) and a reactive eluate  
 (D) DAT positive (IgG and C3) and a nonreactive eluate
165. An ABO type on a patient gives the following reactions:

Patient Cells With	Patient Serum With
Anti-A Anti-B	A1 cells B cells
4+ 4+	Neg Neg

- What is the patient's blood type?  
 (A) O (B) A  
 (C) B (D) AB
166. Which of the following ABO blood groups contains the least amount of H substance?  
 (A) A1B (B) A2  
 (C) B (D) O
167. An example of a technical error that can result in an ABO discrepancy is:  
 (A) Acquired B phenomenon. (B) Missing isoagglutinins.  
 (C) Cell suspension that is too heavy. (D) Acriflavine antibodies.
168. RBCs made universal by masking of RBC antigens using  
 (A) PEG (B) BSA  
 (C) DTT (D) 2ME
169. Apparent phenotype of an individual with Genotype hh  
 (A) Cannot be determined (B) B  
 (C) AB (D) O

170. The ABO locus is on chromosome number  
(A) 1 (B) 4  
 (C) 9 (D) 19
171. If a woman is Rh negative and her husband is heterozygous for D, then probability that the child will inherit D is?  
(A) 25% (B)  50%  
(C) 75% (D) None of the above
172. Antibodies are excluded using RBCs that are homozygous for the corresponding antigen because:  
 (A) Antibodies may show dosage  
(B) Multiple antibodies may be present  
(C) It results in a P value of 0.05 for proper identification of the antibody  
(D) All of the above
173. Which of the following antibody is least likely to be naturally occurring  
 (A) Anti D (B) Anti M  
(C) Anti A (D) Anti B
174. Which is an advantage of an HPC transplant using umbilical cord blood as the HPC source?  
(A) Recipient weight of no concern. (B) Donor screening and testing abbreviated  
(C) Higher risk of GVHD (D)  No significant risk to the donor or mother
175. What is the test of choice for HLA antigen testing?  
(A) Agglutination (B)  Molecular  
(C) Cytotoxicity (D) ELISA
176. Why is HLA matching not feasible in cardiac transplantation?  
(A) No HLAs are present on cardiac cells (B) No donors ever have HLA antibodies  
(C) Total ischemic time is too long (D)  Total ischemic time is too short
177. Among the combinations of attributes described below, select the one that would not be suitable for a genetic system used in parentage testing analysis.  
(A) The system has multiple alleles in Hardy-Weinberg equilibrium  
 (B) The system has a high mutation rate  
(C) Databases of allele frequencies are available for all ethnic groups tested by the laboratory  
(D) All systems selected are genetically independent from each other
178. Methods of Antibody Identification are  
(A) Saline test at room temperature for IgM  
(B) Enzyme (one stage technique) or albumin (additive technique) for IgG  
(C) IAT for IgG and anti-complement antibodies  
 (D) All of the above

179. Anti I can be neutralized with  
 (A) Hydatid cyst fluid (B) Saliva  
 (C) Human breast milk (D) Urine
180. Many warm-reactive autoantibodies have a broad specificity within which of the following blood groups?  
 (A) Kell. (B) Duffy.  
 (C) Rh. (D) Kidd.
181. The blood group involved in the autoantibody specificity in PCH is:  
 (A) P. (B) ABO.  
 (C) Rh. (D) Lewis.
182. Which is not true of rouleaux formation?  
 (A) Mimics agglutination (B) Appears like a “stacking of coins”  
 (C) Can be seen in the antiglobulin test (D) Can be dispersed by saline
183. Eggs and sperm are formed through the process of  
 (A) Mitosis  (B) Meiosis  
 (C) Linkage (D) Crossing-over
184. A blood sample is received for type and screen, but the sample is labeled with the patient’s last and first names only. What additional information is necessary for the sample to be acceptable for use?  
 (A) Nothing else is required, the label is acceptable  
 (B) A patient identification number or second patient identifier  
 (C) Physician’s name  
 (D) Patient location
185. The lectin used for detection of the H antigen is called:  
 (A) *Arachis hypogaea* (B) *Dolichos biflorus*  
 (C) *Ulex europaeus* (D) *Salvia sclarea*
186. ABO grouping discrepancies may occur due to which of the following causes?  
 (A) Rouleaux (B) Clerical error  
 (C) Atypical antibody  (D) All of the above
187. Antigens carried on molecules with a GPI linkage to the red cell surface are often involved in which of the following functions?  
 (A) Cytokine receptor (B) Glycerol and water transport  
 (C) Enzymatic activities (D) Adhesion function
188. Which of the following antigens is linked to the Kell glycoprotein by a single disulfide bond?  
 (A) JMH  (B) Kx  
 (C) Gerbich (D) Dombrock
189. Colour of the label used for autologous transfusions units  
 (A) Pink (B) Orange  
 (C) Green (D) Blue

