Direction
To earn the CME credit, please answer the following questions and return the answers to the CME Office at Sina & Sadra Convention Center, Neshaat Street, Shiraz, 71345.1846, Iran. Successful completion of the test is defined as a score of at least 70% correct.

1) Which of the following acid-base disturbances is usually seen during the anhepatic phase of liver transplantation?
   a. Metabolic alkalosis
   b. Respiratory acidosis
   c. Lactic acidosis
   d. Mixed respiratory and metabolic acidosis

2) Administration of a large amount of normal saline solution usually causes:
   a. Hyperchloremic metabolic acidosis
   b. Hyperchloremic metabolic alkalosis
   c. High anion gap metabolic acidosis
   d. Lactic acidosis

3) Which of the following items is not a complication of sodium bicarbonate therapy?
   a. Increasing plasma sodium
   b. Increasing plasma osmolarity
   c. Decreasing plasma osmolarity
   d. Increasing CO₂ production

4) Administration of sodium bicarbonate usually causes:
   a. Intracellular alkalosis
   b. Intracellular acidosis
   c. Decreasing plasma lactic acid
   d. Decreasing plasma tonicity

5) Which of the following cardiovascular changes is usually seen during end-stage liver disease?
   a. Low systemic vascular resistance
   b. Ischemic heart disease
   c. Ischemic cardiomyopathy
   d. Pulmonary valvular regurgitation

6) Currently, which of the following items is considered standard treatment for metabolic acidosis during liver transplantation surgery?
   a. Colloid solution therapy
   b. Ringer solution therapy
   c. Ringer lactate solution therapy
   d. Sodium bicarbonate therapy

7) During liver transplantation surgery for maintenance of the hemodynamic which of the following strategies prevents progressive metabolic acidosis?
   a. Use of a large quantity of the crystalloid fluid.
   b. Use of a mixture of crystalloid and colloid fluids.
   c. Use of a mixture of crystalloid and colloid fluids and vasoconstrictors.
   d. Use of a large quantity of crystalloid fluid and vasoconstrictors.

8) Metabolic alkalosis occurs at which stage of liver transplantation surgery?
   a. Hepatectomy
   b. Anhepatic
   c. Neo-hepatic
   d. None of the above
9) Sodium bicarbonate increases lactic acid production by:
   a. Increasing anaerobic glycolysis
   b. Limiting phosphofructokinase function
   c. Shifting the oxyhemoglobin curve to the right
   d. All of the above

10) Correction of metabolic acidosis with sodium bicarbonate in patients with hyponatremia could increase the possibility of:
    a. Mixed metabolic acid respiratory alkalosis
    b. Cerebroptentine myelinolyses
    c. Severe hypotensive reaction
    d. Severe hypotonicity of plasma

11) Regarding causes of hypotension during the hepatectomy phase of liver transplantation, which of the following items is not correct?
    a. Drainage of ascites fluid
    b. Bleeding during hepatectomy
    c. Mobilization of the liver
    d. Severe lactic acidosis

12) At the end of liver transplantation surgery, early sign of good graft function is:
    a. Respiratory alkalosis
    b. Subsiding metabolic acidosis
    c. Increasing CO₂ production
    d. Normalization of plasma glucose

13) Which of the statements regarding the effect of normal saline administration on strong ion difference (SID) is correct?
    a. Decreasing SID
    b. Increasing SID
    c. No change in SID
    d. Increasing weak acid

14) What is the meaning of strong ion difference (SID)?
    a. (Na+ K)-(Cl+HCO₃)
    b. Na-(Cl+HCO₃)
    c. (Na+ Mg+ Ca+ K) - (Cl+HCO₃)
    d. (Na+ Mg+ Ca+ K) - (Cl +A⁻)

15) For treatment of hypotension in patients with end stage-stage liver disease, which of the following vasoconstrictors is better?
    a. Epinephrine
    b. Dobutamin
    c. Dopamine
    d. Norepinephrine

16) In end stage liver disease for correction of an acid-base disturbance, it is best to consider:
    a. Strong ion difference
    b. Total concentration of weak acid
    c. The PaCO₂
    d. All of the above

17) Administration of normal saline decreases SID, with increasing which of the following ion?
    a. Na
    b. CL
    c. HC3
    d. Mg
18) What is the best definition of a crystalloid solution?
   a Solution in which the major component is glucose
   b Solution in which the major component is Na
   c Solution in which the major component is Mg
   d Solution in which the major is Ca

19) Administration of sodium bicarbonate usually causes?
   a Increasing strong ion differences
   b Decreasing strong ion differences
   c Decreasing CO₂ production
   d Increasing serum chloride

20) If ventilation is not adequate, administration of sodium bicarbonate usually causes:
   a Respiratory alkalosis
   b Respiratory acidosis
   c Increasing PaCO₂
   d B and C