

Q1: Which of the following makes water a liquid at room temperature?

- a) Noncovalent interactions
- b) Hydrogen bonds between water molecules
- c) Van der Waals forces of attraction
- d) Covalent bonding

Answer: b

Q2: Which of the following mixture in aqueous solution of equimolar concentration acts as a buffer solution?

- a) $\text{NH}_4\text{OH}(\text{excess}) + \text{HCl}$
- b) $\text{HNO}_3 + \text{NaOH}$
- c) $\text{CH}_3\text{COOH} + \text{NaOH}(\text{excess})$
- d) $\text{H}_2\text{SO}_4 + \text{KOH}$

Answer: a

Q3: Which of the following is an example of epimers?

- a) Mannose & Glucose
- b) Glucose & Ribose
- c) Galactose & Mannose
- d) Glucose & Galactose

Answer: d

Q4: In which of the following, glucose residues are linked by $\beta 1 \rightarrow 4$ glycosidic bonds?

- a) Starch
- b) Cellulose
- c) Glycogen
- d) Amylose

Answer: b

Q5: Raffinose is an example of a ____

- a) monosaccharide
- b) disaccharide
- c) trisaccharide
- d) tetrasaccharide

Answer: c

Q6: Which of the following disaccharides gives two same monosaccharide units on hydrolysis?

- a) Maltose
- b) Sucrose
- c) Lactose
- d) Lactulose

Answer: a

Q7: Sucrose consists of which of the following monosaccharide units?

- a) Fructose, galactose
- b) Fructose, glucose
- c) Galactose, glucose
- d) Glucose, glucose

Answer: b

Q8: Which of the following is a non-reducing sugar?

- a) Galactose
- b) Glucose
- c) Fructose
- d) Sucrose

Answer: d

Q9: Which of the following carbohydrates does not satisfy the formula $C_x(H_2O)_y$?

- a) Fructose
- b) Glucose
- c) Deoxyribose
- d) Lactose

Answer: c

Q10: Which of the following carbohydrates does not have the formula $C_{12}H_{22}O_{11}$?

- a) Galactose
- b) Sucrose
- c) Allolactose
- d) Maltose

Answer: a

Q11: Which of the following monosaccharaides is a ketohexose?

- a) Glucose
- b) Galactose
- c) Fructose
- d) Mannose

Answer: c

Q12: Which of the following tests does glucose give?

- a) Tollen's test
- b) 2,4-DNP test
- c) Schiff's test
- d) Addition product with NaHSO_3

Answer: a

Q13: The α -D-glucose and β -D-glucose isomers of glucose are known as ____

- a) enantiomers
- b) stereoisomers
- c) anomers
- d) glycomers

Answer: c

Q14: The hydroxyl group at which carbon is involved in ring formation in glucose?

- a) C3
- b) C4
- c) C5
- d) C6

Answer: c

Q15: When the OH group at anomeric carbon lies on the same side as that of the OH group on C3 carbon, it is known as __

- a) α -glucose
- b) β -glucose
- c) D-glucose
- d) (+)-glucose

Answer: b

Q16: Which of the following is incorrect with respect to fructose?

- a) It is a ketohexose
- b) It is present in honey
- c) It has 'L' configuration
- d) It is known as laevulose

Answer: c

Q17: The furanose structure of fructose is obtained by the interaction of groups at which carbon atoms?

- a) C1 and C5
- b) C1 and C6
- c) C2 and C5
- d) C2 and C6

Answer: c

Q18: Which of the following disaccharides on hydrolysis with invertase gives two different monosaccharides?

- a) Sucrose
- b) Lactulose
- c) Lactose
- d) Maltose

Answer: a

Q19: Two monosaccharides are joined through a _ bond to form a disaccharide.

- a) ionic
- b) peptide
- c) glycosidic
- d) phosphodiester

Answer: c

Q20: Which of the following is false regarding the reaction of sucrose to give fructose and glucose?

- a) It can take place in the presence of enzyme sucrase
- b) It results in the formation of a glycosidic bond.
- c) It is an inversion reaction
- d) It is a hydrolysis reaction

Answer: b

Q21: Which of the following is incorrect regarding maltose?

- a) It consists of two glucopyranose units
- b) It is a non-reducing sugar
- c) Glycosidic bond between C1 of one unit and C4 of the other unit
- d) It is a disaccharide

Answer: b

Q22: Which of the following statements is incorrect with respect to starch?

- a) It is a reducing carbohydrate
- b) It is a polymer of α -D-glucose
- c) It gives blue colour with iodine
- d) It consists of branched chains

Answer: a

Q23: The branching in the _ component of starch occurs by the glycosidic linkage between _ carbons.

- a) amylose; C1-C4
- b) amylose; C1-C6
- c) amylopectin; C1-C4
- d) amylopectin; C1-C6

Answer: d

Q24: Starch : Plants :: X : Animals. Identify X.

- a) Starch
- b) Glucose
- c) Cellulose
- d) Glycogen

Answer: d

Q25: For arterial blood has a pH of 7.22 and P_{CO_2} of 20 mmHg, is ventilation increased, decreased, or unchanged (compared with normal)?

Answer: increased (compensatory hyperventilation for metabolic acidosis)

Q26: A person's arterial blood pH is 7.25, P_{CO_2} is 24 mmHg, and HCO_3^- is 10.2 mEq/L. Which of the following might cause this pattern: diarrhea, vomiting, obstructive pulmonary disease, hysterical hyperventilation, salicylate overdose, chronic renal failure?

Answer: Diarrhea, salicylate OD, chronic renal failure

Q27: A patient is seen in the emergency department with the following blood values: pH 7.1, $HCO_3^- = 10$ mEq/L; $Na^+ = 142$ mEq/L; and $Cl^- = 103$ mEq/L. What is the acid-base disorder?

Answer: Metabolic acidosis

Q28: Among patients with the following disorders, which is/are hyperventilating: diarrhea, vomiting, ascent to high altitude, morphine overdose, obstructive lung disease, hyperaldosteronism, ethylene glycol poisoning, salicylate poisoning?

Answer : vomiting, morphine OD, obstructive lung disease, hyperaldosteronism

Q29: Two patients have an elevated arterial P_{CO_2} of 70 mmHg. One has acute respiratory acidosis and the other has chronic respiratory acidosis. Which patient has the higher blood HCO_3^- concentration? Which patient has the higher pH?

Answer : the patient with chronic respiratory acidosis will have the higher HCO_3^- and the higher pH (closer to normal)

Q30: A patient has the following blood values: pH 7.22, $HCO_3^- = 18$ mEq/L, and $P_{CO_2} = 45$ mmHg. Are these values consistent with a simple acid-base disorder? If yes, which one? If no, what acid-base disorders are present?

Answer: No; metabolic acidosis and respiratory acidosis

Q31: In the conversion from acute to chronic respiratory alkalosis, what happens to blood pH?

Answer: Decreases (toward normal)

Q32: The reason that respiratory compensation for metabolic alkalosis can never be complete (return plasma pH to normal) is that (Note: PaCO_2 = systemic arterial carbon dioxide partial pressure.)

- A. high PaCO_2 inhibits respiratory ventilation
- B. high PaCO_2 stimulates respiratory ventilation
- C. low PaCO_2 inhibits respiratory ventilation
- D. low PaCO_2 stimulates respiratory ventilation
- E. none of the above, since respiratory compensation for metabolic alkalosis can be complete

Answer : B. Respiratory compensation for metabolic alkalosis involves depression of alveolar ventilation to accumulate CO_2 . However, the higher PaCO_2 stimulates ventilation, which prevents complete compensation (return of pH to 7.4)

Q33: The appearance of large amounts of ammonium ion (NH_4^+) in the urine is characteristic of the renal response to :

- A. respiratory acidosis
- B. respiratory alkalosis
- C. acidosis resulting from pancreatic diabetes
- D. alkalosis resulting from gastric vomiting
- E. both A and C above

Answer: E. Renal compensation for acidosis, of both respiratory and metabolic origin (assuming the metabolic acidosis is not due to renal pathology), involves synthesis of NH_3 and subsequent excretion of NH_4^+ .

Q34: An individual hoping for an LSD "acid high" mistakenly gives himself an intravenous injection of hydrochloric acid. The responses of his body which attempt to compensate for this ignorance of physiology include all of the following except:

- A. hyperventilation
- B. increase in the acid form of the blood fixed buffers
- C. decrease in blood bicarbonate ion concentration
- D. increase in urine bicarbonate ion excretion
- E. increase in urine ammonium ion excretion

Answer : D. Renal compensation for acidosis involves bicarbonate reabsorption, not bicarbonate excretion.

Q35: A young woman is found comatose, having taken an unknown number of sleeping pills an unknown time before. An arterial blood sample yields the following values: pH 6.90 HCO_3^- 13 meq/liter PaCO_2 68 mmHg. This patient's acid-base status is most accurately described as :

- A. uncompensated metabolic acidosis
- B. uncompensated respiratory acidosis
- C. simultaneous respiratory and metabolic acidosis
- D. respiratory acidosis with partial renal compensation
- E. respiratory acidosis with complete renal compensation

Answer: C. The low pH indicates acidosis. The low bicarbonate indicates metabolic acidosis. The high PaCO_2 indicates respiratory acidosis. Presumably, the narcotic overdose depressed the patient's respiratory center in the brain, reducing ventilation. The reduction of available oxygen then caused cellular anaerobic metabolism to increase, leading to production of lactic acid, etc.

Q36: Which of the following is an example of bacterial and yeast polysaccharide ?

- A) Starch
- B) Glycogen
- C) Cellulose
- D) Dextrans

Answer : D

Q37: In which of the following , glucose residues are linked by β 1,4 glycosidic bonds ?

- A) Amylose
- B) Starch
- C) Cellulose
- D) Glycogen

Answer : C

Q38:When all monosaccharaides in a polysaccharide are same type , such type of a polysaccharide is called :

- A)Glycogen
- B)Homoglycan
- C)Heteroglycan
- D)Oligosaccharide

Answer :B

Q39:In which of the following forms , glucose is stored in the liver ?

- A)Glycogen
- B)Starch
- C)Dextrin
- D)Cellulose

Answer :A

Q40: Which of the following are the structural polysaccharides ?

- A) Glycogen
- B) Starch
- C) Chitin
- D) Glucose

Answer: C

Q41: Which of the following is analogous to starch ?

- A) Cellulose
- B) Glycogen
- C) Sucrose
- D) Chitin

Answer : B

Q42: Which part of glycogen is the reducing end ?

- A) Second monomer from the left
- B) Second monomer from the right
- C) Left end
- D) Right end

Answer : D

Q43: Which part of cellulose is the non-reducing end ?

- A) Second monomer from the left
- B) Second monomer from the right
- C) Left end
- D) Right end

Answer : C