بعض الاسئلة فيها صعوبة تعود تشغل مخك

انتم من ضمن اذكى 5% من البشر

1. **Which of the following is not a conjugate acid/base pair?**
   a. CH_3COOH/CH_3COO^-
   b. $HCOOH/HCOO^-$
   c. H_3PO_4/HPO_4^{-2}
   d. HCO_3^-/CO_3^{-2}

2. **Which of the following changes will not happened when strong acid is added to an aqueous solution?**
   a. H^+ will increase
   b. pH will increase
   c. pOH will increase
   d. OH^- will decrease

3. **Kw =**
   a. 1×10^{-14} M
   b. 1×10^{-14} M^2
   c. 1×10^{-7} M
   d. 1×10^{-7} M^2

4. **The following are Ka's of some acids; the weakest acid is?**
   a. 5.3×10^{-3}
   b. 7.2×10^{-2}
   c. 1.5×10^{-11}
   d. 3.3×10^{-9}

5. **The following are pka's of some acids the strongest acid is:**
   a. 4.5
   b. 2.7
   c. 5.3
   d. 9.2

6. **What is the pH of 0.5 M solution HCl?**
   a. 0.3
   b. 0.5
   c. 3
   d. 5

7. **Calculate the pH of a solution contain 75 / 25 ratio of conjugate base / acid if pKa = 5?**
   a. 6.47
   b. 5.47
   c. 4.52
   d. 3.52

8. **What is the pKa of a weak acid if at pH = 9, A^- / HA ratio is 100:1?**
   a. 11
   b. 7
   c. 10
   d. 8

9. **What is the pH of a solution contains equal amounts of H_2CO_3 and $NaHCO_3$ (H_2CO_3 Pka_1 = 6.1 , pKa_2 = 10.2)**
   a. 6.1
   b. 10.2
   c. 7.9
   d. 3.8

10. **What is the pH of a solution prepared by mixing equal concentration of H_3PO_4 and NaH_2PO_4 (pKa_1 = 2.1, pKa_2 = 7.2, pKa_3 = 12.4)?**
    a. 12.4
    b. 7.2
    c. 2.1
    d. Cannot be known.

11. **A phosphoric acid H_3PO_4 (pKa_1 = 2.1 , pKa_2 = 7.2 , pKa_3 = 12.4) solution that has pH = 9, which of the following species will be the predominate form of phosphate?**
    a. H_3PO_4
    b. $H_2PO_4^-$
    c. HPO_4^{-2}
    d. PO_4^{-3}

12. **What is the pH of a buffer solution has NH_4^+ / NH_3 ratio is 4, pKa NH_4^+ = 4.7**
    a. 8.7
    b. 10
    c. 4.1
    d. 5.3

13. **HA is a weak acid, pKa = 6; at what pH 50 % of this acid dissociate?**
    a. 5
    b. 6
    c. 7
    d. 8

14. at what pH 91 % of an acid dissociate?

a. pH = pKa – 1
b. pH = pKa + 1
c. pH = pKa +2
d. pH = pKa + 3

15. If you have X moles of NaOH, how many moles of weak acid must be added to have buffer with equal concentration of HA and A^-?

a. X
b. X/2
c. 2X
d. 1.5X

16. weak acid HA has pka = 4.4, which solution below containing the acid and its salt NaA will have pH exactly 5?

a. HA= 0.25 M , NaA= 0.1 M
b. HA= 0.4 M , NaA= 0.1 M
c. HA= 0.1 M , NaA= 0.4 M
d. HA= 0.1 M , NaA= 0.25 M
e. None

17. 100 mmole of triprotic acid were titrated with NaOH; pKa Values 3,6,9, How many mmoles of NaOH must be added to have pH=6?

a. 100
b. 150
c. 200
d. 250
e. 300

18. If a solution has H_3PO_4:$H_2PO_4^-$ ratio = 25:75 pKas for H_3PO_4 = 2.14 ,7.2 , 12.4; What is the pH of this solution?

a. 7.7
b. 6.7
c. 2.6
d. 12.9
e. 11.9

19. if 0.1 M solutions of sodium dihydrogen phosphate (NaH_2PO_4) and disodium hydrogen phosphate (Na_2HPO_4) are mixed together in equal proportion, what is the approximate pH (pks H_3PO_4 = 2.1 , 7.2 , 12)

a. 12
b. 9.4
c. 7.2
d. 4.4
e. 2.1

20. Which of the following statement about Henderson-Hasselbalch equation is false?

a. It relates the pH of the solution with the pKa of the weak acid
b. pH is variable
c. base/acid ratio is constant
d. pKa is constant

21. when the pH of weak acid solution increase:

a. conjugate base/acid ratio increase
b. conjugate base/acid is unaffected
c. Acid/conjugate base ratio increase
d. pKa is increased

22. Which of the following buffers would be most suitable for maintaining the pH of a biochemical experiment at pH 7.4?

a. CH_3COOH/CH_3COO^- pKa = 4.67
b. NH_4^+/NH_3 pKa = 4.5
c. H_2PO4^-/HPO_4^{-2} pKa = 7.2
d. $H_3PO_4/H_2PO_4^-$ pKa = 2.1

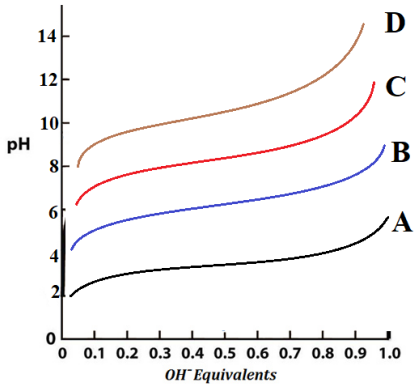
23. You prepare a sodium phosphate buffer by mixing 100ml of 0.1M Na_2HPO_4 with 100ml of 0.01M NaH_2PO_4. The pH of the final solution is 8.5, what is the approximate pka of the acid component of the buffer?

a. 5.5
b. 7.5
c. 6.5
d. 8.5

24. You have been observing an insect that defends itself from enemies by secreting a liquid. Analysis of this liquid shows it to have a concentration of formic acid (pka = 3.75) of 1.45M and concentration of formate ion of 0.015M, what is the pH of the secretion?

a. 7.00
b. 1.76
c. 5.73
d. 1.91

Refer following titration curve of 4 different monoprotic acids, then answer Question 25 and 26



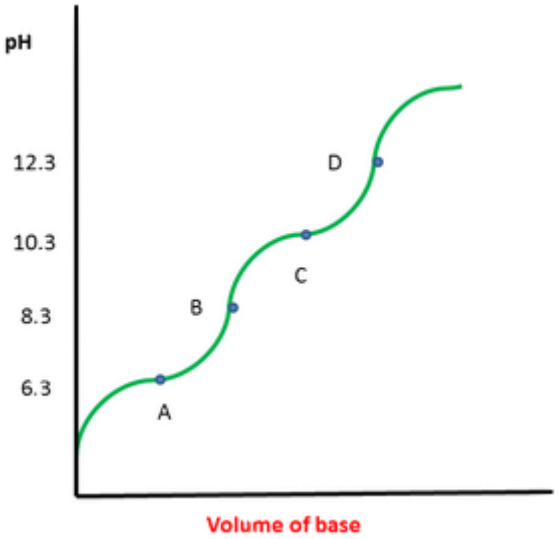
25. Which acid is the strongest?

a. A
b. B
c. C
d. D

26. Which acid can form a buffer at pH = 8?

a. A
b. B
c. C
d. D

Refer to the following figure which represent the titration curve of Carbonic acid (H_2CO_3) then answer questions (27-29)



27. Which point(s) on the graph represent the pKa

a. A and B
b. A and C
c. B and C
d. B and D

28. The predominate species at point B is:

a. $H2CO_3$
b. HCO_3^-
c. CO_3^{-2}
d. Equal H_2CO_3 and HCO_3^-

29. What is the net charge at point A?

a. +1
b. Zero
c. – 0.5
d. – 1
e. – 2

30. A 2 years old child present with metabolic acidosis after ingesting an unknown number of flavored Aspirin (Acetyl salicylic acid), at presentation his blood pH was 7 (normal 7.35-7.45), given that pKa of Aspirin is 3, calculate the ratio of ionized (conjugate base) to unionized (Acid) form of Aspirin in his blood?

a. 0.1
b. 10
c. 1000
d. 10'000

31. J.P is a 59 years old male patient admitted to the hospital by his wife, she claimed that he is a diabetic and he refuse to take insulin injection, in the blood sample taken [HCO_3^-] = 16.2 and [H_2CO_3]= 1.26 , pka is 6.1, most likely pH of blood is:

a. 7.1 b. 7.2 c. 7.3 d. 7.5 e. 7.7

32. What is the concentration of OH^- in a solution of pH = 6?

a. 10^{-6} M
b. 8 M
c. 10^{-8} M
d. 10^{-3} M
e. 6 M

33. Formic acid HCOOH is a weak acid with pKa value = 3.76 at pH = 5, what will be it's pKa at pH = 3?

a. Lesser than 3.76
b. Greater than 3.76
c. Equals 3.76
d. Equals 3
e. Greater than 3

34. One of the following characteristics describe Triprotic acids:

a. Has 3 different forms during titration
b. Has 3 ionizable groups
c. Require one OH^- equivalent for complete titration
d. Form 3 different buffers with the same buffer capacity region
e. Cannot be found in nature

35. What is the pH when 0.1 M HCl solution is added to 1 Liter of 0.6M buffer solution pka = 9.4 at maximum buffering capacity "ignore changes in volume"?

a. Lesser than or equal 8.4
b. Equal 9.4
c. Greater than 9.4
d. Lesser than 9.4
e. Equal to 8.4

عندما تعطى تركيز Buffer كامل هذا يمثل مجموع تراكيز

Weak acid and its conjugate base

36. Which of the following cannot form buffer solution when mixed together?

a. 10mM of CH_3COOH / 10mM CH_3COO^-
b. 10mM of CH_3COOH / 5mM NaOH
c. 10mM of CH_3COO^- / 5mM HCl
d. 10mM CH_3COOH / 10mM NaOH

37. What is the net charge of phosphate ion when 0.1M of H_3PO_4 is titrated by 0.15M of NaOH?

a. Zero
b. - 1
c. - 2
d. - 0.5
e. – 1.5

38. Calculate the volume of 0.1M NaOH solution that is required to titrate 10ml of 0.25M solution of HCOOH "Formic acid"

a. 15 ml
b. 10 ml
c. 25 ml
d. 50 ml

39. How many mmols of NaOH required for complete neutralization of 15mmol of H_2SO_4 "sulfuric acid = diprotic acid"

a. 15 mmol
b. 25 mmol
c. 30 mmol
d. 45 mmol

40. In a titration of sulfuric acid (H_2SO_4 a diprotic acid) against sodium hydroxide, 32.20 mL of 0.250M NaOH is required to neutralize 26.60mL of H2SO4. Calculate the molarity of the sulfuric acid?

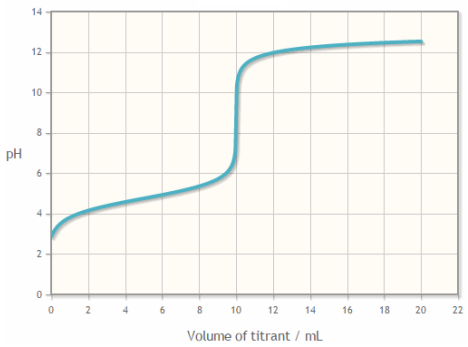
a. 0.1 M
b. 0.15 M
c. 0.3 M
d. 0. 25 M

41. In a titration of phosphoric acid (H_3PO_4 a Triprotic acid) against sodium hydroxide, 32.20 mL of 0.250M NaOH is required to neutralize 26.60mL of H3PO4. Calculate the molarity of the phosphoric acid?

a. 0.1 M
b. 0.15 M
c. 0.3 M
d. 0. 25 M

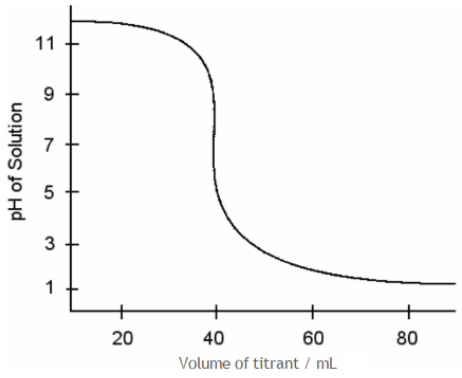
42. In the titration curve shown, determine the Analyte/Titrant respectively:

a. Strong acid/ weak base
b. Weak base/strong acid
c. Strong base/weak acid
d. Weak acid/strong base



43. Examine the titration curve shown. Which of the following titration could it represent?

a. NH_3 by CH_3COOH
b. NaOH by CH_3COOH
c. NH_3 by HCl
d. NaOH by HCl



Question	Answer	Question	Answer
1	C	31	B
2	B	32	C
3	B	33	C
4	C	34	B
5	B	35	D
6	A	36	D
7	B	37	E
8	B	38	C
9	A	39	C
10	C	40	B
11	C	41	A
12	D	42	D
13	B	43	D
14	B		
15	C		
16	C		
17	B		
18	C		
19	C		
20	C		
21	A		
22	C		
23	B		
24	B		
25	A		
26	C		
27	B		
28	B		
29	C		
30	D		