41. (c) $\underset{\text{Conjugate acid}}{H_2PO_4^-} \rightleftharpoons H^+ + HPO_4^{2-}$ action.

42. (d) $H^+ + OH^- \rightleftharpoons H_2O$, it is a neutralization reaction.

43. (c) It is a conjugate base of the strong acid.

44. (a) Because those acid have higher pK_a value are weak acid.

45. (a) Conjugate acid is obtained from the base by gain of H^+.

46. (c) CH_3COOH is weak acid shows dissociation equilibrium as $CH_3COOH \rightleftharpoons CH_3COO^- + H^+$

47. (c) $pK_a = log_{10}\frac{1}{K_a}$

48. (d) A weak acid and strong base.

49. (a) In NaH_2PO_2 both hydrogen are bonded with 'P,' so it is not replaceable.

50. (b) Aqueous solution of Na_2CO_3 is alkaline due to hydrolysis of CO_3^{--}.

51. (b) Because they give CO_3^{--} in solution.

52. (a) M.eq. of $0.2M\ H_2SO_4 = \frac{2\times0.2M}{1000} \times 100 = 0.04\ m/l$

M.eq. of $.2M\ \ NaOH = \frac{0.2}{1000} \times 100 = 0.02\ m/l$

left $[H^+] = .04 - .02 = .02$.

Total volume $= 200 = \frac{.02}{200} = .0001 = 10^{-4}M$

$pH = 4$.

53. (a) H_3BO_3 is a weak monobasic acid it does not act as a H^+donor but behaves as a Lewis acid.

54. (a) Because $SnCl_2$ is a electron acceptor according to Lewis concept.

55. (d) *ROH* is a Lewis base because it has an lone pair of electron.

56. (b) $H_2SO_4 + 2H_2O \rightleftharpoons 2H_3O^+ + SO_4^{--}$

$NaOH \rightleftharpoons Na^+ + OH^-$

1 mole of H_2SO_4 acid gives 2 moles of H_3O^+ ions. So 2 moles of OH^- are required for complete neutralization.

57. (ab)Diprotic solvents give $2H^+$ ions or OH^- ions.

58. (a) $N_{NaOH} = 1 \times 1 = 1N$

$\boldsymbol{N_{H_2SO_4} = 2 \times 10 = 20N}$

M.eq. of $NaOH = 1 \times 100 = 100$

M.eq. of $H_2SO4 = 20 \times 10 = 200$

Thus M.eq. of acid are left and therefore $pH < 7$, so the resulting mixture will be acidic.

59. **(c) Either weak acids or weak bases**

Explanation (Simple & Clear):
pH indicators are substances that change colour with change in pH. They must ionize slightly and exist in two different coloured forms depending on pH.
This is possible only when the indicator is a weak acid or weak base.

60. (d) PH_3 is a Lewis base.