21 **(d) NH_3**

Explanation (Simple & Clear):

A **Lewis acid** is an **electron pair acceptor**.

22. (b) $Ba(NO_3)_2$does not undergo hydrolysis.

23. (b) $H_2SO_4$is a mineral acid.

24. (c) Because it is a electron pair acceptor it' s central atom have a vacant *d*-orbital.

25. (d) $HClO_4$is a acid and their conjugate base is ClO_4^-.

26. (c) It is completely ionised because their ionization is very high.

27. (c) $NaHCO_3$in water is alkaline in nature due to hydrolysis of HCO_3^-ion. $NaCO_3 \rightleftharpoons Na^+ + HCO_3^-$

28. (d) In this reaction H_2Oacts as a acid.

29. (b) The basic character of hydride decreases down the group.

30. (b) Its ionization is very less.

31. **(b) As a base**

Explanation (Simple & Clear):

In liquid hydrogen fluoride (HF), the solvent system is:

$HF \rightleftharpoons H^+ + HF_2^-$

So:

A substance that gives H^+ behaves as an acid.

A substance that accepts H^+ behaves as a base.

Now, HNO_3 is normally an acid in water.

But in liquid HF, it accepts a proton (H^+) → therefore it acts as a BASE.

32. (c) Hydrolysis of Cu^{2+} produces H^+ ions in solution.

$$Cu^{2+} + 2H_2O \rightarrow Cu(OH)_2 + 2H^+$$

33. (d) Both possess the tendancy to accept proton.

34. (a) *HF* does not give proton easily.

35. (a) In weak electrolyte the degree of dissociation is very small. So it increases with increasing dilution.

36. (a) Because it is a electron pair acceptor.

37. (c) $H_3PO_4 \overset{\text{I step}}{\rightleftharpoons} H^+ + H_2PO_4^-$

$H_2PO_4^- \overset{\text{II step}}{\rightleftharpoons} H^+ + HPO_4^{--}$

$HPO_4^{--} \overset{\text{III step}}{\rightleftharpoons} H^+ + PO_4^{---}$

38. (c) Na_2HPO_4 on hydrolysis of HPO_4^{2-} ion produces free OH^- ion in solution.

39. (c) $H_2SO_4 \rightleftharpoons H^+ + HSO_4^-$.

40. (a) $Fe^{3+} + 3H_2O \rightarrow Fe(OH)_3 + 3H^+$