Unit 7: Nitrogen, Sulphur and Metals

37 MCQs. Correct option in bold. 1 mark each.

1. A key component of photochemical smog formed from NO, NO_2 and unburned hydrocarbons is
A. carbon monoxide **B. peroxyacetyl nitrate (PAN)**
C. sulphuric acid D. ammonia

2. PAN stands for
A. polyacetyl nitrogen B. photoacetyl nitrate
C. peroxy acid nitrite **D. peroxyacetyl nitrate**

3. The oxides of nitrogen involved in photochemical smog are
A. N_2O_5 only B. NH_3 and HNO_3
C. NO and NO_2 D. N_2 and NH_3

4. In sunlight, NO_2 undergoes photodissociation to form NO and
A. an oxygen atom B. ammonia
C. nitrogen D. hydrogen

5. Acid rain is rain having a pH less than
A. 7 **B. 5** C. 9 D. 3

6. Acid rain is caused mainly by dissolving of SO_2 and _____ in rainwater.
A. NO_2 B. H_2 C. N_2 D. O_2

7. In the formation of acid rain, NO_2 acts as a _____ in the oxidation of SO_2.
A. reactant that is used up B. solvent
C. product **D. catalyst**

8. SO_3 reacts with water vapour to form
A. sulphurous acid B. hydrochloric acid
C. sulphuric acid D. nitric acid

9. The Contact process is used for the manufacture of
A. sodium carbonate B. nitric acid
C. ammonia **D. sulphuric acid**

10. The Contact process is based on the catalytic oxidation of
A. SO_2 to SO_3 B. NH_3 to NO
C. H_2 to H_2O D. N_2 to NH_3

11. The balanced equation of the key step in the Contact process is
A. $SO_2 + H_2O \rightarrow H_2SO_3$ B. $S + O_2 \rightarrow SO_2$ only
C. $2SO_2 + O_2 \square 2SO_3$ D. $N_2 + 3H_2 \square 2NH_3$

12. In the Contact process, sulphur dioxide is produced by burning sulphur or
A. burning natural gas **B. roasting sulphide ores**
C. electrolysis of water D. burning methane

13. The catalyst used in the Contact process is
A. nickel B. iron
C. platinum **D. vanadium(V) oxide**

14. The typical temperature for the Contact process is
A. 450 °C B. 1000 °C C. 200 °C D. 700 °C

15. The Contact process reaction is
A. reversible and endothermic B. irreversible and exothermic
C. reversible and exothermic D. irreversible and endothermic

16. In the Contact process, SO_3 is absorbed in 98 % H_2SO_4 to give
A. nitric acid **B. oleum ($H_2S_2O_7$)**
C. ammonia D. water

17. The Haber process is used to manufacture
A. ammonia B. sulphuric acid
C. nitric acid D. sodium carbonate

18. The balanced equation for the production of ammonia is
A. $2NH_3 \rightarrow N_2 + 3H_2$ only **B. $N_2 + 3H_2 \square 2NH_3$**
C. $N_2 + 2H_2 \rightarrow 2NH_3$ D. $N_2 + H_2 \rightarrow NH_3$

19. What are the sources of hydrogen and nitrogen in the Haber process?
A. Methane and water B. Water and air
C. Methane and air D. Water and methane

20. The catalyst used in the Haber process is
A. vanadium(V) oxide B. platinum
C. nickel **D. iron**

21. The temperature typically used in the Haber process is
A. 300 °C B. 600 °C **C. 450 °C** D. 200 °C

22. The pressure typically used in the Haber process is about
A. 20 atm **B. 200 atm** C. 1 atm D. 2 atm

23. The boiling point of ammonia is about
A. 33 °C B. 0 °C C. 100 °C **D. −33 °C**

24. Binary compounds of elements with oxygen are called
A. oxides B. salts C. acids D. hydrides

25. Acidic oxides are generally oxides of
A. alkali metals B. noble gases only
C. metals **D. non-metals**

26. Which of the following is an acidic oxide?
A. CuO B. CaO **C. SO_2** D. Na_2O

27. SO_2 reacts with water to form
A. sulphurous acid (H_2SO_3) B. calcium hydroxide
C. sulphuric acid only D. sodium hydroxide

28. Basic oxides are generally oxides of
A. noble gases **B. metals**
C. non-metals D. halogens

29. Which of the following is a basic oxide?
A. SO_2 B. NO_2 C. CO_2 **D. CaO**

30. Amphoteric oxides react with
A. only acids B. neither acids nor bases
C. both acids and bases D. only bases

31. Which of the following oxides is amphoteric?
A. Al_2O_3 B. CO_2 C. SO_2 D. CuO

32. Atmospheric oxides react with acids and bases to form
A. a base and hydrogen **B. a salt and water**
C. an acid and a gas D. a salt and hydrogen

33. Metals react with dilute acids to form a salt and
A. hydrogen gas B. carbon dioxide
C. oxygen gas D. water only

34. Which metals do not react with dilute acids?
A. Iron and aluminium **B. Copper, silver and gold**
C. Sodium and potassium D. Magnesium and zinc

35. Which metals react vigorously with cold water?
A. Zinc and iron B. Gold and platinum
C. Copper and silver **D. Potassium, sodium and calcium**

36. Which metal does NOT react with steam?
A. Magnesium B. Iron **C. Copper** D. Zinc

37. The correct order of decreasing reactivity is
A. Au > Ag > Cu > Pb > Fe > Zn
B. Na > K > Ca > Al > Mg > Fe > Zn
C. Cu > Fe > Zn > Mg > Na
D. K > Na > Ca > Mg > Al > Zn > Fe > Pb > Cu > Ag > Au