

- (B) Iron
- (C) Boron
- (D) Carbon

Answer: Option D

03. Raw materials for nitric acid manufacture are

- (A) Hydrogen peroxide, air and water
- (B) Anhydrous ammonia and air
- (C) Anhydrous ammonia, air and water
- (D) Wet ammonia, air and water

Answer: Option C

04. $H_4P_2O_7$ is the chemical formula of _____ phosphoric acid.

- (A) Pyro
- (B) Ortho
- (C) Meta
- (D) None of these

Answer: Option A

05. Plant tranquillisers

- (A) Hold back stem growth and halt plants at a desired height
- (B) Cause early maturation of plants
- (C) Accelerate ripening of food and grain
- (D) Produce seedless fruit

Answer: Option A

06. Catalytic ammonia synthesis reaction as in Haber's process is

- (A) Endothermic
- (B) Exothermic
- (C) Irreversible
- (D) None of these

Answer: Option B

07. Nitrogen content of a nitrogenous fertiliser is 35%. It could be

- (A) Urea
- (B) Ammonium nitrate
- (C) Calcium ammonium nitrate (CAN)
- (D) Ammonium sulphate

Answer: Option B

08. Which one of the following is used as a nitrogenous fertiliser, as a weed killer in the onion fields and for correcting acidic soils?

- (A) Urea
- (B) CAN
- (C) Ammonium sulphate
- (D) Calcium cyanamide

Answer: Option D

09. Nitrogen content of urea is about _____ percent.

- (A) 10
- (B) 46
- (C) 80
- (D) 94

Answer: Option B

10. The most suitable fertiliser for accelerating seeding or fruit formation in later stages of plant growth is _____ fertiliser.

- (A) Nitrogenous
- (B) Phosphatic
- (C) Potassic
- (D) None of these

Answer: Option B

11. With increases in pressure, the conversion of Ammonium carbamate into urea

- (A) Increases

- (B) Decreases
 - (C) Remains unaltered
 - (D) Can either increase or decrease depends on biuret content
- Answer: Option A

12. Triple superphosphate is made by reacting phosphate rock with _____ acid.

- (A) Phosphoric
- (B) Nitric
- (C) Sulphuric
- (D) Hydrochloric

Answer: Option A

13. Nitric acid is produced on commercial scale in a fertiliser plant by

- (A) Oxidation of ammonia
- (B) $\text{CaNO}_3 + \text{H}_2\text{SO}_4$ reaction
- (C) Passing air through high voltage electric arc
- (D) None of these

Answer: Option A

14. _____ catalyst is used in the production of urea from CO_2 and NH_3 .

- (A) Vanadium pentoxide
- (B) No
- (C) Alumina
- (D) Nickel

Answer: Option B

15. In ammonia synthesis ($\text{N}_2 + 3\text{H}_2 = 2\text{NH}_3$), there is a decrease in total volume, hence to get high equilibrium conversion, the reaction should be carried out at

- (A) Low pressure
- (B) High pressure
- (C) Very high temperature
- (D) Atmospheric pressure; as the pressure has no effect on conversion

Answer: Option B

16. Ammonium nitrate is

- (A) Having about 40% N_2
- (B) Not hygroscopic
- (C) Not prone to explosive thermal decomposition
- (D) Mixed with limestone powder to reduce its explosive nature before using it as a fertilizer

Answer: Option D

17. Tricresyl phosphate is chemically represented as

- (A) $(\text{CH}_3 \text{C}_6 \text{H}_4)_3 \text{PO}_4$
- (B) $\text{Ca}_{10}(\text{PO}_4)_3\text{F}_6$
- (C) $(\text{NH}_4)_2\text{HPO}_4$
- (D) $\text{NH}_4\text{H}_2\text{PO}_4$

Answer: Option A

18. Reaction of anhydrous liquid ammonia with ortho-phosphoric acid produces

- (A) Ammonium phosphate
- (B) Superphosphate
- (C) Triple superphosphate
- (D) None of these

Answer: Option A

19. Nitrolime is

- (A) Calcium nitrate
- (B) Calcium ammonium nitrate
- (C) A mixture of nitric acid and lime
- (D) A mixture of ammonium nitrate and calcium nitrate

Answer: Option B

20. 5-10-5 fertilisers mean that they contain

- (A) 5, 10, 5% respectively of N_2 , P_2O_5 and K_2O
- (B) Only 5 to 10% active fertiliser constituents

- (C) 5 to 10% filler & carrier of soil conditioners
(D) None of these
Answer: Option A

21. Multistage operation (as in the case of catalytic oxidation of SO₂) is not carried out for NH₃ synthesis, because of

- (A) Comparatively higher pressure drop
(B) High cost of the high pressure vessel used for the reactor
(C) Higher pumping cost
(D) Chances of entrainment and disturbance of catalyst bed
Answer: Option B

22. Hydrogen is recovered from coke oven gas on commercial scale (as practised in fertiliser plant at Rourkela) by

- (A) Adsorption on palladium
(B) Cryogenic operations (low temperature cooling)
(C) Absorption (using ethanolamine or pyrogallol solution)
(D) None of these
Answer: Option B

23. Steam reforming of naphtha produces ammonia synthesis gas. This is a/an _____ process.

- (A) Autocatalytic
(B) Endothermic
(C) Exothermic
(D) Non-catalytic
Answer: Option B

24. Catalyst used in steam reforming of naphtha is

- (A) Nickel
(B) Platinum
(C) Silica gel
(D) Rhodium
Answer: Option A

25. An increase in the NH₃/CO₂ ratio in urea manufacture results in

- (A) Increased degree of conversion of CO₂ to urea
(B) Decreased degree of conversion of NH₃ to urea
(C) Decreased yield of urea
(D) Decreased specific volume of molten mass
Answer: Option A

26. Color of nitric acid is light yellow due to the presence of

- (A) NO
(B) NO₂
(C) N₂H₅
(D) NH₃
Answer: Option B

27. Maximum nitrogen percentage is in

- (A) Ammonium sulphate
(B) Calcium ammonium nitrate
(C) Urea
(D) Liquid ammonia
Answer: Option D

28. Fauser Montecatini converter is used for

- (A) Ammonia synthesis (e.g. at FCI Sindri, India)
(B) Methanation of CO and CO₂
(C) Shift conversion (i.e. CO to CO₂)
(D) None of these
Answer: Option A

29. Fertiliser plants get their N₂ requirements

- (A) By fractionation of liquefied air

- (B) By dissociating oxides of nitrogen
 - (C) From coal gas (coke oven gas)
 - (D) From producer gas
- Answer: Option A

30. Which of the following is not a commercially used feed-stock for the production of ammonia synthesis gas?

- (A) Water
 - (B) Naphtha
 - (C) Tar
 - (D) Coal/coke oven gas
- Answer: Option C

31. Which of the following is not a measure component necessarily to be present in fertilisers?

- (A) Nitrogen
 - (B) Potassium
 - (C) Phosphorous
 - (D) Sulphur
- Answer: Option D

32. Conditioners like finely divided peat are added to the fertiliser to

- (A) Counteract burning
 - (B) Avoid caking & hardening
 - (C) Produce bulk
 - (D) Increase its solubility
- Answer: Option B

33. Yield of urea can be increased with excess ammonia and higher pressure & temperature, but because of _____ this is normally not done.

- (A) Increased biuret formation
 - (B) High corrosion rate
 - (C) Increased cost of equipment
 - (D) All (A), (B) & (C)
- Answer: Option D

34. Urea is a better fertilizer than ammonium sulphate, because

- (A) It is cheaper
 - (B) Nitrogen content is higher
 - (C) It is not poisonous
 - (D) It is easy to manufacture
- Answer: Option B

35. The concentration (weight %) of nitric acid produced by the oxidation of ammonia and absorption of nitrogen oxides with water is about _____ percent.

- (A) 60
 - (B) 30
 - (C) 95
 - (D) 100
- Answer: Option A

36. Electric furnace method for production of phosphorous uses phosphate rock and _____

- (A) Phosphoric acid
 - (B) Coke
 - (C) Sulphuric acid
 - (D) Silica and coke
- Answer: Option D

37. Heating of coke, sand & phosphate rock in an electric furnace is done for the manufacture of

- (A) Phosphoric acid
 - (B) Superphosphate
 - (C) Phosphorous
 - (D) Triple superphosphate
- Answer: Option C

38. Lower temperature and large excess of ammonia in urea melt

- (A) Increases biuret formation
- (B) Decreases biuret formation
- (C) Is undesirable
- (D) Does not effect biuret formation

Answer: Option B

39. Which of the following is the costliest method for commercial production of hydrogen for ammonia synthesis?

- (A) H₂ separation from coke oven gas
- (B) Steam reforming of naphtha
- (C) Cracking of natural gas
- (D) Electrolysis of water

Answer: Option D

40. Bio-fertilisers are cheaper, renewable and pollution free. They improve the _____ of the soil.

- (A) Nutrient supply
- (B) Texture
- (C) Water holding capacity
- (D) All (A), (B) and (C)

Answer: Option D

41. Urea is formed only

- (A) In liquid phase
- (B) In vapour phase
- (C) At very high temperature
- (D) At very low pressure (vacuum)

Answer: Option A

42. Montecatini process is used for the manufacture of

- (A) Nitric acid
- (B) Phosphoric acid
- (C) Urea
- (D) Calcium ammonium nitrate (CAN)

Answer: Option C

43. A mixture of phosphate rock _____ is heated in an electric furnace to produce phosphorous.

- (A) Salt & coke
- (B) Sand & coke
- (C) And coke
- (D) And sand

Answer: Option B

44. Sodium tri poly phosphate (STPP) is manufactured by reaction of phosphoric acid with sodium

- (A) Carbonate
- (B) Phosphate
- (C) Bicarbonate
- (D) Silicate

Answer: Option A

45. _____ is the most suitable fertiliser for paddy.

- (A) Urea
- (B) Ammonium sulphate
- (C) Superphosphate
- (D) Potassium nitrate

Answer: Option B

46. Temperature and pressure in urea autoclave is

- (A) 120°C and 300 atm
- (B) 190°C and 200 atm
- (C) 400°C and 550 atm
- (D) 200°C and 10 atm

Answer: Option B

47. Phosphorus vapour comprises of

- (A) P
- (B) P_2
- (C) P_3
- (D) P_4

Answer: Option D

48. Coal based fertiliser plants at Ramagundam (Andhra Pradesh) and Talcher (Orissa)

- (A) Use coal for heating purpose
- (B) Gasify coal to get hydrogen from coal gas
- (C) Use coal as filler in fertiliser
- (D) Use coal as conditioner in fertiliser

Answer: Option B

49. Reaction of Cresylic acid with _____ produces Tricresyl phosphate.

- (A) Phosphorous pentoxide
- (B) Phosphorous oxychloride
- (C) Ammonium phosphate
- (D) Calcium phosphate

Answer: Option B

50. During conversion of ammonium carbamate into urea, presence of large excess of water

- (A) Increases the yield of urea
- (B) Adversely affects the yield of urea
- (C) Reduces the evaporator load by diluting the urea solution
- (D) Does not affect the yield of urea

Answer: Option B

51. Commercial production of hydrogen for the manufacture of nitrogenous fertilisers is done by

- (A) Steam reforming of naphtha and cracking of natural gas
- (B) Electrolysis of water
- (C) Cryogenic separation of hydrogen from coke oven gas
- (D) All (A), (B) and (C)

Answer: Option D

52. Excessive use of chemical fertilisers causes shrivelling of the roots and wilting of the plant, because the

- (A) Osmotic pressure of the soil water becomes less than that of the plant sap
- (B) Soil becomes too alkaline
- (C) Osmotic pressure of the soil water becomes higher than that of the plant sap
- (D) Soil becomes too acidic

Answer: Option C

53. Liquid ammonia is not used as such a fertiliser in tropical countries like India, because

- (A) Its N_2 content is very low
- (B) It is very costly
- (C) It will evaporate on spraying
- (D) It is not available

Answer: Option C

54. The essential ingredient of all the synthesis gas is

- (A) H_2
- (B) O_2
- (C) CO_2
- (D) N_2

Answer: Option A

55. Low grade phosphate rock can be used in electrical furnace, because

- (A) Of the better CaO/SiO_2 balance for slag formation
- (B) CaO content is less
- (C) It is cheap
- (D) It produces low cost product

Answer: Option A

56. CO₂ present in reformed gas (obtained by steam reforming of naphtha) is removed by absorbing in

- (A) Mono-ethanolamine (MEA)
- (B) Slaked lime
- (C) Ammoniacal liquor
- (D) Methyl-Ethyl Ketone (MEK)

Answer: Option A

57. Naphtha in a fertiliser plant is used as a source of

- (A) Fuel
- (B) H₂
- (C) N₂
- (D) O₂

Answer: Option B

58. P₂O₅ percentage in the phosphoric acid produced by wet process is about

- (A) 10
- (B) 30
- (C) 50
- (D) 70

Answer: Option B

59. Use of catalyst is a must in the ammonia manufacture, because the reaction is reversible as well as the heat of dissociation of N₂ & H₂ is high. The presence of promoter along with the catalyst helps in _____ of the catalyst.

- (A) Stabilisation
- (B) Increasing the effectiveness
- (C) Improving the strength & heat resistance
- (D) All a, b & c

Answer: Option D

60. The fertiliser plant getting hydrogen by electrolysis of water is situated at (INDIA):

- (A) Namrup
- (B) Nangal
- (C) Rourkela
- (D) Korba

Answer: Option B

61. Phosphatic fertiliser is graded based on its _____ content.

- (A) P₂O₃
- (B) PCl₅
- (C) P₂O₅
- (D) H₃PO₄

Answer: Option C

62. Catalyst used in Haber's process for ammonia production is

- (A) Reduced iron oxide
- (B) Nickel
- (C) Vanadium pentoxide
- (D) Silica gel

Answer: Option A

63. Which of the following gasifiers can be attached to coal based fertiliser plants?

- (A) Lurgi (high pressure) gasifier
- (B) Kopper-Totzek gasifier
- (C) Gasifier working at 20 atm
- (D) Gasifier working at 40 atm

Answer: Option B

64. In the manufacture of urea, the intermediate chemical formed is

- (A) Biuret
- (B) Ammonium carbamate
- (C) Ammonium carbonate

(D) None of these
Answer: Option B

65. Conversion of yellow phosphorous to red phosphorous is done by heating it in covered retorts at _____ °C in absence of air.

- (A) 50-80
- (B) 250-400
- (C) 1000-1200
- (D) 800-900

Answer: Option B

66. Which fertiliser is made (using coke oven gas) in by products plant of an integrated steel plant?

- (A) Urea
- (B) CAN
- (C) Ammonium sulphate
- (D) Superphosphate

Answer: Option C

67. Reaction of _____ acid with phosphate rock produces superphosphates.

- (A) Hydrochloric
- (B) Sulphuric
- (C) Nitric
- (D) Phosphoric

Answer: Option B

68. Pick out the wrong statement.

- (A) 'Green acid' is the other name of phosphoric acid produced by the reaction of phosphate rock & sulphuric acid
- (B) Chemically unreactive nature of red phosphorous is due to its polymeric structure
- (C) Red phosphorous is the most reactive allotropic form of phosphorous
- (D) Red phosphorous, which is used in the manufacture of safety matches, is converted into white phosphorous by vaporisation followed by condensation

Answer: Option C

69. HPO_3 is the chemical formula of _____ phosphoric acid.

- (A) Pyro
- (B) Ortho
- (C) Meta
- (D) None of these

Answer: Option C

70. Catalyst used in the oxidation of ammonia is

- (A) Platinum-beryllium
- (B) Platinum-rhodium
- (C) Cobalt-molybdenum
- (D) Platinum-molybdenum

Answer: Option B

71. $(\text{CH}_3 \text{ C}_6 \text{ H}_4)_3 \text{ PO}_4$ is the chemical formula of

- (A) Triple superphosphate
- (B) Tricresyl phosphate
- (C) Fluorapatite
- (D) Superphosphate

Answer: Option B

72. Largest capacity nitrogenous fertiliser plants (2700 tons of NH_3 per day) (2 Nos.) in India are located at

- (A) Thal-Vaishet (under RCF in Maharashtra) and Hazira (under IFFCO in Gujarat)
- (B) Talcher (Orissa) and Ramagundam (A.P.) both under FCI
- (C) Korba (M.P.) and Talcher (Orissa) both under FCI
- (D) Haldia (W.B) and Namrup (Assam) both under HFC

Answer: Option A

73. During nitric acid manufacture, catalytic oxidation of ammonia at 800°C in presence of platinum catalyst produces nitrogen oxide. Conversion of NH₃ to NO is about _____ percent.

- (A) 38
- (B) 68
- (C) 82
- (D) 98

Answer: Option D

74. H₃PO₄ is the chemical formula of _____ phosphoric acid.

- (A) Pyro
- (B) Ortho
- (C) Meta
- (D) None of these

Answer: Option B

75. Ammonia synthesis reaction is

- (A) Exothermic
- (B) Endothermic
- (C) Autocatalytic
- (D) None of these

Answer: Option A

76. Nitrolime is chemically known as

- (A) Calcium nitrate
- (B) Ammonium nitrate
- (C) Calcium ammonium nitrate (CAN)
- (D) None of these

Answer: Option C

77. Nitrogenous fertiliser is required

- (A) During the early stage of growth to promote development of stem and leaves
- (B) For accelerating fruit formation in later stage of growth
- (C) To lessen the effect of excessive potash application
- (D) None of these

Answer: Option A

78. Ammonium phosphate is a _____ fertiliser.

- (A) Nitrogenous
- (B) Phosphatic
- (C) Complex
- (D) Mixed

Answer: Option D

79. In the manufacture of ortho-phosphoric acid by strong H₂SO₄ leaching wet process, keeping the reactor temperature above 100°C, results in the formation of undesirable

- (A) CaSO₄ · ½ H₂O and CaSO₄ crystals
- (B) Pyrophosphoric acid
- (C) Meta-phosphoric acid
- (D) All (A), (B) and (C)

Answer: Option A

80. Commercial fertilisers are available mostly in the form of

- (A) Powder
- (B) Granules
- (C) Lumps
- (D) Flakes

Answer: Option B

81. Reaction of phosphate rock with 98% H₂SO₄ produces

- (A) Ortho-phosphoric acid
- (B) Superphosphate
- (C) White phosphorous
- (D) None of these

Answer: Option A

82. A fertiliser plant is classified as a gas based fertiliser plant, when it uses _____ gas as a source of hydrogen for the manufacture of ammonia.

- (A) Coke oven
- (B) Producer
- (C) Natural
- (D) Coal

Answer: Option C

83. Reaction of dilute sulphuric acid with phosphate rock produces

- (A) Phosphoric acid
- (B) Superphosphate
- (C) Triple superphosphate
- (D) Gypsum

Answer: Option A

84. Catalyst used in ammonia synthesis uses _____ as a promoter.

- (A) Pt
- (B) K_2O
- (C) Al_2O_3
- (D) Ni

Answer: Option B

85. Neutralisation of nitric acid with ammonia to produce ammonium nitrate is a/an _____ reaction.

- (A) Catalytic
- (B) Endothermic
- (C) Exothermic
- (D) Autocatalytic

Answer: Option C

86. Which is the most suitable fertiliser for paddy?

- (A) CAN
- (B) Ammonium sulphate
- (C) Ammonium nitrate
- (D) Superphosphate

Answer: Option B

87. Triple superphosphate is chemically represented as

- (A) $CaF_2 \cdot 3Ca_3(PO_4)_2$
- (B) $3Ca_3(PO_4)_2$
- (C) $Ca(PO_3)_2$
- (D) $Ca(H_2PO_4)_2$

Answer: Option A

88. Potassic fertilisers

- (A) Are useful during early stage of the plant growth
- (B) Stimulate early growth and accelerate seeding
- (C) Help in development of starches of potatoes and grain
- (D) None of these

Answer: Option C

89. Vapor phase reaction of ammonia & nitric acid to produce ammonium nitrate is termed as the _____ process.

- (A) Haber's
- (B) Stengel
- (C) Le-chatelier's
- (D) Du-pont's

Answer: Option B

90. Maximum stability of white phosphorous is at

- (A) Very high pressure
- (B) Atmospheric pressure
- (C) Room temperature
- (D) $> 600^\circ C$

Answer: Option D

91. Triple superphosphate which contains about 46% P_2O_5 is produced by the reaction of phosphate rock with ortho phosphoric acid of _____ percent concentration.

- (A) 25-28
- (B) 52-54
- (C) 75-80
- (D) > 98

Answer: Option B

92. Fertiliser plant making ammonium sulphate employing gypsum-ammonia reaction (usual practice is to use ammonia and sulphuric acid) is located in India at

- (A) Rourkela (under SAIL)
- (B) Bokaro (under SAIL)
- (C) Sindri (under FCI)
- (D) Baroda (under G.S.F.C.)

Answer: Option C

93. Promoter used in NH_3 synthesis catalyst is

- (A) K_2O
- (B) SiO_3
- (C) V_2O_5
- (D) U_2O_3

Answer: Option C

94. Though kinetics of ammonia synthesis dictates the use of low temperature for high equilibrium conversion, yet it is kept moderately high ($550^\circ C$), because at low temperature

- (A) Rate of reaction is very low
- (B) Very high pressure is required resulting in costly pressure vessel
- (C) Space velocity of gas is very low resulting in decreased conversion
- (D) None of these

Answer: Option A

95. Pick out the wrong statement.

- (A) All the nitrogenous fertilisers are not soluble in water
- (B) A straight fertiliser contains only one nutrient
- (C) Calcium cyanamide is used as weed killer in onion fields
- (D) The phosphorous nutrient makes the plant stem stronger and increases its branches

Answer: Option A

96. Fertiliser value of a nitrogenous fertiliser is expressed in terms of its _____ content.

- (A) N_2
- (B) KNO_3
- (C) NO_2
- (D) NHO_3

Answer: Option A

97. P_2O_5 content in superphosphate is about _____ percent.

- (A) 30-35
- (B) 15-20
- (C) 65-70
- (D) 85-90

Answer: Option B

98. Base suspension fertiliser essentially contains

- (A) 13% N_2 and 43% P_2O_5
- (B) 43% N_2 and 13% P_2O_5
- (C) 43% N_2 and 13% K_2O
- (D) 43% K_2O and 43% P_2O_5

Answer: Option A

99. Dehydration of ammonium carbamate produces

- (A) Urea
- (B) Biuret
- (C) Ammonia water

(D) None of these
Answer: Option A

100. The main constituent of rock phosphate is

- (A) Mono-calcium phosphate
 - (B) Di-calcium phosphate
 - (C) Fluorspar
 - (D) None of these
- Answer: Option B

101. Calcium ammonium nitrate (CAN) is

- (A) A mixed fertiliser
 - (B) A straight fertiliser
 - (C) A complex fertiliser
 - (D) Not a fertiliser; it is an explosive
- Answer: Option C

102. Potassic fertilisers do not promote the development of

- (A) Stems & leaves during early stage of plant growth
 - (B) Starches of potatoes & grains
 - (C) Sugar of fruits & vegetables
 - (D) Fibrous materials of plants
- Answer: Option A

103. NPK means a _____ fertiliser.

- (A) Mixed
 - (B) Potassic
 - (C) Liquid
 - (D) Solid
- Answer: Option A

104. Heating of ortho-phosphoric acid to 250°C produces

- (A) Meta-phosphoric acid
 - (B) Pyrophosphoric acid
 - (C) No change in it
 - (D) None of these
- Answer: Option B

105. Ammonium nitrate (is mixed with limestone) is not used as fertiliser as such, because

- (A) It is hygroscopic and explosive in nature
 - (B) It is highly acidic in nature
 - (C) It is a liquid at room temperature
 - (D) Its nitrogen content is very less
- Answer: Option A

106. Pick out the wrong statement.

- (A) Nitrogen is normally supplied in fertiliser either in Ammoniacal or the nitrate form, from which the soil takes it up in the form of ammonium ions or nitrate ions and forms amino acids
 - (B) Calcium present in the fertiliser helps in correcting the soil acidity
 - (C) Particle size range of a good granular fertiliser is 10-15 mesh and it contains less moisture as compared to finely divided powder form of fertiliser
 - (D) Ammonium nitrate fertiliser is obtained as a by-product in an integrated steel plant having by-product coke ovens
- Answer: Option D

107. Ammonium sulphate can be produced by reacting gypsum with

- (A) Ammonia
 - (B) Ammonium carbonate
 - (C) Nitric acid
 - (D) None of these
- Answer: Option B

108. Chemical formula of biuret is

- (A) $\text{NH}_2\cdot\text{CO}\cdot\text{NH}_2$
- (B) $\text{NH}_3\cdot\text{COO}\cdot\text{NH}_3$

(C) $\text{NH}_2\text{CONHCONH}_2$

(D) $\text{NH}_4\text{COONH}_2$

Answer: Option C

109. Out of the following, N_2 content is minimum in

(A) Urea

(B) Ammonium nitrate

(C) Ammonium sulphate

(D) Ammonium chloride

Answer: Option C

110. Ammonia synthesis gas is produced from natural gas by

(A) Thermal cracking

(B) Steam reforming

(C) Partial oxidation

(D) Hydrogenation

Answer: Option B

111. The optimum size of the ammonia plant is _____ tons/day.

(A) 10

(B) 100

(C) 1000

(D) 1000

Answer: Option C

112. In an ammonia plant, the purge off is essential to

(A) Maintain inert gas concentration within a limit

(B) Remove excess poisonous gases

(C) Maintain $\text{H}_2 : \text{N}_2$ ratio at 3 : 1

(D) Remove uncondensed ammonia vapour

Answer: Option C

113. Phosphoric acid is produced in wet process from phosphate rock and

(A) Dilute H_2SO_4

(B) Concentrated H_2SO_4

(C) Concentrated HNO_3

(D) Concentrated HCl

Answer: Option A

114. Pick out the wrong statement.

(A) Dehydration of ammonium carbamate to produce urea is endothermic

(B) Direct use of liquid ammonia as a fertiliser for a tropical country like India is suitable

(C) Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) is obtained as a by-product in the wet process for manufacture of ortho-phosphoric acid

(D) Phosphate rock when reacted with dilute H_2SO_4 produces superphosphate

Answer: Option B

115. Iron is not used alone as a catalyst in ammonia synthesis, because

(A) Its activity declines rapidly, if heated to above 520°C

(B) It decomposes ammonia

(C) It gets oxidised above 500°C

(D) None of these

Answer: Option A

116. Superphosphate is manufactured by reacting phosphate rock with

(A) Acetic acid

(B) Sulphuric acid

(C) Aluminium chloride

(D) None of these

Answer: Option B

117. Rock phosphate constitutes mainly of

(A) Fluorapatite

(B) Di-calcium phosphate

(C) Mono-calcium phosphate

(D) Di-ammonium phosphate

Answer: Option A

118. Which of the following nitrogenous fertilisers has the highest percentage of nitrogen?

- (A) Calcium nitrate
- (B) Calcium ammonium nitrate (CAN)
- (C) Urea
- (D) Ammonium sulphate

Answer: Option C

119. Electric process as compared to wet process (for the manufacture of phosphoric acid)

- (A) Can use only high grade phosphate rock
- (B) Is used less frequently
- (C) Produces a valuable by-product called gypsum
- (D) Is weak acid process

Answer: Option B

120. In _____ converter for ammonia synthesis, the catalyst is arranged in the form of a single continuous bed.

- (A) Fauser-Montecatini
- (B) Claude
- (C) Uhde
- (D) Kellogg

Answer: Option B

121. Fertiliser produced during soda ash manufacture by dual process is ammonium

- (A) Chloride
- (B) Sulphate
- (C) Nitrate
- (D) None of these

Answer: Option A

122. Vetrocoke solution is

- (A) A mixture of K_2CO_3 and As_2O_3
- (B) K_2SO_4
- (C) A mixture of Na_2CO_3 and As_2O_3
- (D) Na_2SO_4

Answer: Option A

123. Potassic fertiliser is graded based on its _____ content.

- (A) KCl
- (B) K_2O
- (C) KNO_3
- (D) K_2SO_4

Answer: Option B

124. Ammonia synthesis gas is produced from fuel oil by

- (A) Steam reforming
- (B) Hydro-cracking
- (C) Partial oxidation
- (D) Hydrogenation

Answer: Option C

125. Dehydration of ammonium carbamate (to produce urea) is a/an _____ reaction.

- (A) Reversible
- (B) Catalytic
- (C) Exothermic
- (D) Endothermic

Answer: Option D

126. Reaction of calcium Fluorapatite with sulphuric acid produces

- (A) Ortho-phosphoric acid
- (B) Simple superphosphate
- (C) Triple superphosphate
- (D) Red phosphorous

Answer: Option B

127. The composition of fresh feed to the high temperature, high pressure urea autoclave is

- (A) Excess liquid ammonia and liquefied CO_2
- (B) Excess liquid ammonia and compressed CO_2 gas
- (C) Liquid ammonia and excess compressed CO_2
- (D) Compressed ammonia gas and excess compressed CO_2

Answer: Option B

128. Pick out the wrong statement.

- (A) Yellow phosphorous which is the most reactive allotropic form of phosphorous is transported under water
- (B) Apatite is the principal material present in phosphate rock which is chemically $\text{Ca}_{10}(\text{PO}_4)_6(\text{F}, \text{Cl}, \text{OH})$
- (C) Urea is more hygroscopic than ammonium nitrate
- (D) Nitrogen fixation means the process of bringing atmospheric nitrogen into combination i.e. into nitrogen compound form

Answer: Option C

129. A fertiliser contains 82% N_2 . It could be

- (A) Urea
- (B) Liquid NH_3
- (C) Ammonium nitrate
- (D) None of these

Answer: Option B

130. Which of the following solvents is used for the extraction of H_3PO_4 from CaCl_2 solution during manufacture of ortho-phosphoric acid by wet process employing hydrochloric acid leaching?

- (A) Isopropyl alcohol
- (B) Butyl alcohol
- (C) Toluene
- (D) Hexane

Answer: Option B

131. Catalyst used in the manufacture of NH_3 by Haber's process is finely divided

- (A) Nickel
- (B) Iron
- (C) Vanadium pentoxide
- (D) Alumina

Answer: Option B

132. Main component of bone ash is

- (A) Calcium sulphate
- (B) Calcium phosphate
- (C) Calcium carbonate
- (D) Sodium phosphate

Answer: Option B

133. _____ is required more for leafy crops.

- (A) Nitrogen
- (B) Phosphorous
- (C) Potassium
- (D) Carbon

Answer: Option A

134. Ammonium nitrate (a fertiliser) is coated with limestone powder to

- (A) Increase its nitrogen content
- (B) Cut down its production cost
- (C) Avoid the risk of explosion
- (D) Add extra nutrient as fertiliser

Answer: Option C

135. Nitrogen content of calcium ammonium nitrate (CAN) is _____ percent.

- (A) 10

- (B) 25
- (C) 50
- (D) 80

Answer: Option B

136. Fertilizer plant getting its hydrogen requirement partly from coke oven gas is (in India) situated at

- (A) Rourkela (under SAIL)
- (B) Barauni (under HFC)
- (C) Nangal (under NFL)
- (D) Talcher (under FCI)

Answer: Option A

137. Which is a catalyst promoter used in catalytic ammonia synthesis reaction?

- (A) Al_2O_3
- (B) Cr_2O_3
- (C) K_2O
- (D) MnO

Answer: Option C

138. Heating of ortho-phosphoric acid to about $900^\circ C$, produces

- (A) Meta-phosphoric acid
- (B) Pyrophosphoric acid
- (C) No change in it
- (D) None of these

Answer: Option A

139. Montecatini process is a widely used process for the manufacture of

- (A) Urea
- (B) Calcium ammonium nitrate
- (C) Triple superphosphate
- (D) None of these

Answer: Option A

140. Prilling tower is found in the flowsheet for the manufacture of

- (A) Ammonia
- (B) Urea
- (C) Superphosphate
- (D) Triple superphosphate

Answer: Option B

141. NPK fertiliser is a _____ fertiliser.

- (A) Complex
- (B) Mixed
- (C) Nitrogenous
- (D) Phosphatic

Answer: Option B

142. Which of the following fertilisers is required for the development of fibrous materials of the plants and of the sugar of vegetable & fruits?

- (A) Nitrogenous fertilisers
- (B) Phosphatic fertilisers
- (C) Potassic fertiliser
- (D) None of these

Answer: Option C

143. Red phosphorous is changed into white phosphorous by

- (A) Heating in presence of light
- (B) Melting under pressure
- (C) Vaporisation followed by condensation
- (D) None of these

Answer: Option C

144. Both white phosphorous as well as red phosphorous

- (A) Are soluble in CS_2

- (B) Burns when heated in air
 - (C) Reacts with hot caustic soda solution to give Phosphine
 - (D) All (A), (B), and (C)
- Answer: Option B

145. Reaction of nitric acid and sulphuric acid with phosphate rock produces

- (A) Nitrophosphate
 - (B) Diammonium phosphate
 - (C) Tricresyl phosphate
 - (D) Tributyl phosphate
- Answer: Option A

146. Urea is a _____ fertiliser.

- (A) Nitrogenous
 - (B) Potassic
 - (C) Phosphatic
 - (D) None of these
- Answer: Option A

147. Phosphatic fertilisers

- (A) Are useful during early stage of the plant growth
 - (B) Accelerate fruit formation in later stages of growth
 - (C) Lessen the effect of excessive nitrogen application
 - (D) None of these
- Answer: Option B

148. Dehydration of ammonium carbamate to yield urea is a/an _____ reaction.

- (A) Exothermic
 - (B) Endothermic
 - (C) Autocatalytic
 - (D) Catalytic
- Answer: Option B

149. Reaction of ortho-phosphoric acid with soda ash produces

- (A) Sodium Tributyl phosphate (STPP)
 - (B) Tricresyl phosphate
 - (C) Tributyl phosphate
 - (D) Nitrophosphate
- Answer: Option A

150. Nitrogen content in ammonium sulphate (a fertiliser) is around _____ percent.

- (A) 5
- (B) 20
- (C) 50
- (D) 65

Answer: Option B

151. Urea is represented as

- (A) $\text{NH}_2\cdot\text{CO}\cdot\text{NH}_2$
- (B) $\text{NH}_3\text{CO}\cdot\text{CH}_3$
- (C) $\text{NH}\cdot\text{CO}_2\cdot\text{NH}$
- (D) $\text{NH}_3\cdot\text{CO}_2\cdot\text{NH}_3$

Answer: Option A

152. Flushing liquor used for cooling coke oven gas constitutes of

- (A) Ammoniacal liquor
- (B) K_2CO_3 solution
- (C) Dilute H_2SO_4
- (D) Dilute HCl

Answer: Option A

153. _____ is not a fertiliser.

- (A) Calcium ammonium nitrate
- (B) Ferrous sulphate
- (C) Liquid ammonia

(D) Ammonium sulphate

Answer: Option B

154. Which of the following is not a mixed fertiliser?

(A) Nitrophosphate

(B) Calcium ammonium nitrate (CAN)

(C) Ammonium phosphate

(D) None of these

Answer: Option B

155. P_2O_5 content in triple superphosphate is about _____ percent.

(A) 42-50

(B) 15-20

(C) 85-90

(D) 70-75

Answer: Option A

156. Leaching of phosphate rock by strong _____ acid produces phosphoric acid.

(A) Sulphuric

(B) Hydrochloric

(C) Either (A) or (B)

(D) Neither (A) nor (B)

Answer: Option C

157. Yield of elemental phosphorous from rock phosphate is about _____ percent.

(A) 1-2

(B) 15-25

(C) 40-45

(D) 60-65

Answer: Option B

158. Raw materials required for the production of CAN (Calcium ammonium nitrate) is NH_3

(A) HNO_3 & limestone

(B) CO_2 & H_2SO_4

(C) HNO_3 & NH_4Cl

(D) CO_2 & KNO_3

Answer: Option A

159. Two gas based fertiliser plants are located in India are:

(A) Maharashtra and Gujarat

(B) Maharashtra and Orissa

(C) Gujarat and Madhya Pradesh

(D) Jharkhand and Chhattisgarh

Answer: Option A

160. A nitrogenous fertiliser contains 20% N_2 . It could be

(A) Ammonium nitrate

(B) Calcium ammonium nitrate (CAN)

(C) Urea

(D) Ammonium chloride

Answer: Option B

161. Urea (a nitrogenous fertiliser) is produced from carbon dioxide and

(A) Nitric acid

(B) Ammonia

(C) Ammonium nitrate

(D) Nitric oxide

Answer: Option B

162. Which of the following is the costliest source of hydrogen needed for ammonia manufacture under Indian condition?

(A) Electrolysis of water

(B) Cryogenic removal of H_2 from coke oven gas

(C) Steam reforming of naphtha

(D) Natural gas cracking

Answer: Option A

163. Ammonium sulphate fertiliser is

- (A) The highest concentration nitrogenous fertiliser
- (B) The best fertiliser for paddy
- (C) A basic fertiliser
- (D) A neutral fertiliser

Answer: Option B

164. Chemical formula of meta-phosphoric acid is

- (A) H_3PO_4
- (B) $\text{H}_4\text{P}_2\text{O}_7$
- (C) HPO_3
- (D) Same as that of Pyrophosphoric acid

Answer: Option C

165. Which of the following fertilisers is needed for promoting the development of leaves and stems during early stages of plant growth?

- (A) Nitrogenous fertiliser
- (B) Potassic fertiliser
- (C) Phosphatic fertiliser
- (D) None of these

Answer: Option A

166. Pick out the wrong statement.

- (A) Loamy soil is the best soil for vigorous plant growth, while the clayey soil is solid and hence the plant roots penetrate with difficulty
- (B) Large excess use of nitrogenous fertiliser in land causes the problem of diarrhoea and cyanosis
- (C) Application of large excess of Potassic fertiliser in soil increases the valuable carotene in fruits and vegetables
- (D) Cereal crops grown on alkaline soil absorb higher amount of fluorides thereby spreading fluorosis

Answer: Option C

167. Hydrogen content of coke oven gas is _____ percent.

- (A) 4
- (B) 22
- (C) 58
- (D) 84

Answer: Option C

168. Gas based fertiliser plants use

- (A) Natural gas as a source of hydrogen
- (B) Natural gas as heating medium
- (C) Coal gas as a source of hydrogen
- (D) Coal gas as heating medium

Answer: Option A

169. Which of the following fertilisers is used as a cattle feed?

- (A) Urea
- (B) Calcium ammonium nitrate
- (C) Superphosphate
- (D) Ammonium sulphate

Answer: Option A

170. Main constituent of phosphate rock is

- (A) Ammonium phosphate
- (B) Flour apatite
- (C) Calcium fluoride
- (D) Calcium phosphate

Answer: Option B

171. Which of the following does not come under the category of 'secondary nutrient' for plant growth?

- (A) Calcium

- (B) Magnesium
 - (C) Sulphur
 - (D) Oxygen
- Answer: Option D

172. Low grade coal is _____ to produce ammonia synthesis gas.

- (A) Hydrogenated
 - (B) Liquefied
 - (C) Gasified
 - (D) Dehydrogenated
- Answer: Option C

173. Which of the following set of conditions is favourable for the maximum yield of ammonia by Haber's process?

- (A) High pressure, low reactants concentration, high temperature
 - (B) High pressure, low reactants concentration, low temperature
 - (C) High pressure, high reactants concentration, low temperature
 - (D) Low pressure, high reactants concentration, low temperature
- Answer: Option C

174. Liquid ammonia and 60% nitric acid reaction (which produces ammonium nitrate) is

- (A) Exothermic
 - (B) Endothermic
 - (C) Autocatalytic
 - (D) None of these
- Answer: Option A

175. Steam reforming of naphtha is a source of hydrogen production for nitrogenous fertiliser industry. What is the usual ratio of steam to carbon maintained in the process of steam reforming of naphtha?

- (A) 1.5 : 1
- (B) 3.5 : 1
- (C) 10 : 1
- (D) 15 : 1

Answer: Option B

176. Catalyst used in steam reforming of naphtha is

- (A) Bauxite
- (B) Cobalt
- (C) Nickel oxide on alumina support
- (D) Chromium

Answer: Option C

177. Catalyst used in desulphurisation of naphtha is

- (A) Co-Mo
- (B) Pt-Rh
- (C) Silica gel
- (D) Nickel

Answer: Option A

178. Heating a mixture of phosphate rock, coke and sand in an electric furnace produces

- (A) Phosphoric acid
- (B) Ammonium phosphate
- (C) Phosphorous
- (D) Superphosphate

Answer: Option C

179. In calcium ammonium nitrate (CAN) fertiliser

- (A) Nitrate nitrogen is quick acting
- (B) Ammoniacal nitrogen is quick acting
- (C) Nitrate nitrogen is slower acting
- (D) None of these

Answer: Option A

180. Nitro-phosphate (manufactured at Trombay-India) is a _____ fertiliser.

- (A) Mixed
 - (B) Complex
 - (C) Highly hygroscopic
 - (D) Highly explosive
- Answer: Option B

181. Optimum reaction temperature in steam reforming of naphtha is _____ °C.

- (A) 700 - 1000
- (B) 300 - 450
- (C) 1500-1700
- (D) 100-200

Answer: Option A

182. Which of the following fertilisers contains the least percentage of nitrogen?

- (A) Liquid ammonia
- (B) Urea
- (C) Ammonium phosphate
- (D) Ammonium sulphate

Answer: Option C

183. Action of phosphoric acid on rock phosphate produces

- (A) Superphosphate
- (B) Triple superphosphate
- (C) Nitrophosphate
- (D) Diammonium phosphate

Answer: Option B

184. pH value of soil is maintained at _____ by the addition of fertiliser for optimum growth and health of the plant.

- (A) 4-5
- (B) 7-8
- (C) 9-10
- (D) 12-13

Answer: Option B

185. Which is the best fertiliser for paddy?

- (A) Ammonium sulphate
- (B) Nitro-phosphate
- (C) Superphosphate
- (D) Potassium nitrate

Answer: Option A

186. Though liquid ammonia itself is a fertiliser (with 82% nitrogen content) yet it is commonly not used as such in a tropical country like India, because it

- (A) Has a pungent smell
- (B) Vaporises at normal temperature
- (C) Is toxic and highly corrosive
- (D) Is in short supply

Answer: Option B

187. Effectiveness of a fertiliser is independent of the

- (A) Nature of soil
- (B) Type of crop
- (C) pH of soil
- (D) None of these

Answer: Option D

188. In the manufacture of H_3PO_4 (ortho); strong H_2SO_4 leaching wet process as compared to electric furnace process

- (A) Uses lower grade phosphate rock
- (B) Requires lower capital investment in the plant
- (C) Produces lower purity acid
- (D) Is very costly

Answer: Option C

189. Biuret formation in urea is kept at minimum (< 1 %), because it is

- (A) Corrosive in nature
- (B) Toxic and harmful to some crops
- (C) Helpful in decomposition of urea
- (D) Explosive in nature

Answer: Option B

190. Oxidation of ammonia is

- (A) Exothermic
- (B) Endothermic
- (C) Non-catalytic
- (D) Autocatalytic

Answer: Option A

191. Reaction of ortho-phosphoric acid with phosphate rock produces

- (A) Superphosphate
- (B) Triple superphosphate
- (C) Meta-phosphoric acid
- (D) Monoammonium phosphate

Answer: Option B

192. Pick out the correct statement.

- (A) Reaction of NH_3 with HNO_3 to produce $(\text{NH}_4)_2\text{NO}_3$ is endothermic
- (B) With increase in NH_3/CO_2 ratio, urea yield decreases for a given temperature, pressure and total feed rate
- (C) Biuret (an intermediate during urea manufacture) is toxic to seeds and animals
- (D) Both (B) and (C)

Answer: Option B

193. A phosphatic fertiliser contains 16% P_2O_5 . It could be

- (A) Dicalcium phosphate
- (B) Superphosphate
- (C) Triple superphosphate
- (D) None of these

Answer: Option B

194. _____ is the undesirable by-product produced in the manufacture of urea.

- (A) Ammonium carbonate
- (B) Biuret
- (C) Carbon dioxide
- (D) Ammonium carbamate

Answer: Option B

195. Fusion zone in the electric furnace used for reduction of phosphate rock to elemental phosphorous is maintained at _____ °C.

- (A) 250-300
- (B) 500-750
- (C) 950-1050
- (D) 1400-1450

Answer: Option D

196. Temperature and pressure in ammonia converter is

- (A) 200 atm, 1000°C
- (B) 450 atm, 200°C
- (C) 450 atm, 550°C
- (D) 450 atm, 1000°C

Answer: Option C

197. Formation of ammonium carbamate by reaction of NH_3 with CO_2 is a/an _____ reaction.

- (A) Catalytic
- (B) Exothermic
- (C) Endothermic
- (D) Reversible

Answer: Option B

198. C/H ratio (by weight) of naphtha used in nitrogenous fertiliser making is about

- (A) 2
- (B) 6
- (C) 13
- (D) 20

Answer: Option B

199. Raw materials for urea production are

- (A) CO_2 and N_2
- (B) CO_2 , H_2 and N_2
- (C) NH_3 and CO
- (D) HNO_3 and CaCO_3

Answer: Option B

200. Rock phosphate used for the production of phosphatic fertiliser is mined at (INDIA):

- (A) Amjhor (Jharkhand)
- (B) Talcher (Orissa)
- (C) Bailladella (M.P.)
- (D) Kiriburu (Bihar)

Answer: Option A

201. $\text{CaH}_4(\text{PO}_4)_2$ is the chemical formula of

- (A) Superphosphate
- (B) Triple superphosphate
- (C) Calcium phosphate
- (D) Meta phosphoric acid

Answer: Option B

202. A Potassic fertiliser contains 50% K_2O . It could be

- (A) Potassium sulphate
- (B) Potassium chloride
- (C) A mixture of $\text{NaCl} + \text{KCl}$
- (D) None of these

Answer: Option A

203. In natural gas, the C/H ratio (by weight) varies in the range of

- (A) 3-4
- (B) 8-10
- (C) 15-17
- (D) 20-25

Answer: Option A

204. Prilling of urea should be accomplished (in a sprayer) just above the melting point of urea with minimum of retention time, otherwise it will result in

- (A) Low bulk density product
- (B) Biuret formation
- (C) Non-spherical prills
- (D) Substantially wet non-flowing and sticky product

Answer: Option B

205. Conversion of yellow phosphorus to red phosphorous is done in retorts at 250-450°C in the

- (A) Presence of an inert atmosphere
- (B) Presence of a reducing atmosphere
- (C) Absence of air
- (D) Presence of an oxidising atmosphere

Answer: Option C

206. Which nutrient in fertiliser makes the plant stems stronger and increases branching?

- (A) Nitrogen
- (B) Phosphorous
- (C) Potassium
- (D) Calcium

Answer: Option B