IC Engines and Nuclear Power Plants

1. The device used to convert chemical energy into mechanical energy is:

(A) Boiler

(B) IC Engine

(C) Turbine

(D) Condenser

Answer: B) IC Engine

2. The cycle used in petrol engines is:

(A) Otto cycle

(B) Diesel cycle

(C) Brayton cycle

(D) Rankine cycle

Answer: A) Otto cycle

3. The cycle used in diesel engines is:

(A) Otto cycle

(B) Diesel cycle

(C) Carnot cycle

(D) Dual cycle

Answer: B) Diesel cycle

4. The air-fuel ratio for a petrol engine is typically:

(A) 8:1

(B) 15:1

(C) 30:1

(D) 50:1

Answer: B) 15:1

5. The function of a carburetor is to:

(A) Atomize fuel

(B) Mix air and fuel

(C) Supply air only

(D) Supply fuel only

Answer: B) Mix air and fuel

6. The compression ratio in diesel engines is:

(A) 4–8

(B) 6–10

(C) 12–20

(D) 20–30

Answer: C) 12–20

7. Spark plug is used in:

(A) Diesel engine

(B) Petrol engine

(C) Both

(D) None of these

Answer: B) Petrol engine

8. The major product after fission in nuclear reactors is:

(A) Uranium

(B) Plutonium

(C) Barium and Krypton

(D) Thorium

Answer: C) Barium and Krypton

9. The moderator used in nuclear reactors to slow down neutrons is:

(A) Heavy water

(B) Light water

(C) Carbon

(D) All of these

Answer: D) All of these

10. The proportion of oxygen in air is about:

(A) 21%

(B) 78%

(C) 0.03%

(D) 50%

Answer: A) 21%

11. The calorific value of petrol is approximately:

(A) 25 MJ/kg

(B) 42 MJ/kg

(C) 50 MJ/kg

(D) 60 MJ/kg

Answer: B) 42 MJ/kg

12. The control rods in nuclear power plants are made of:

(A) Cadmium

(B) Copper

(C) Lead

(D) Zinc

Answer: A) Cadmium

13. Diesel engine is also known as:

(A) Spark ignition engine

(B) Compression ignition engine

(C) Gasoline engine

(D) Two-stroke engine

Answer: B) Compression ignition engine

14. Cylinder liners are generally made of:

(A) Cast iron

(B) Copper

(C) Brass

(D) Aluminum

Answer: A) Cast iron

15. The ratio of work output to the input energy in an engine is:

(A) Efficiency

(B) Power

(C) Torque

(D) BHP

Answer: A) Efficiency

16. The coolant used in IC engines is usually:

(A) Water

(B) Air

(C) Oil

(D) Sodium

Answer: A) Water

17. Regeneration in nuclear power plants refers to:

(A) Reuse of heat

(B) Reuse of steam

(C) Reuse of fuel

(D) Reuse of moderator

Answer: A) Reuse of heat

18. Exhaust gases from an engine are expelled through:

(A) Intake valve

(B) Exhaust valve

(C) Cylinder

(D) Carburetor

Answer: B) Exhaust valve

19. The fuel used in nuclear reactor is:

(A) U-235

(B) Coal

(C) Diesel

(D) Natural gas

Answer: A) U-235

20. The engine cycle used for aircraft is:

(A) Otto cycle

(B) Diesel cycle

(C) Brayton cycle

(D) Dual cycle

Answer: C) Brayton cycle

21. Self-ignition temperature of diesel is:

(A) 220°C

(B) 350°C

(C) 600°C

(D) 800°C

Answer: B) 350°C

22. Pre-ignition occurs when:

(A) Spark occurs before piston reaches TDC

(B) Spark occurs after piston reaches TDC

(C) Injection occurs before piston reaches BDC

(D) None

Answer: A) Spark occurs before piston reaches TDC

23. The heat exchanger in nuclear power plants is called:

(A) Boiler

(B) Reactor

(C) Steam generator

(D) Condenser

Answer: C) Steam generator

24. The cycle efficiency of IC engines is improved by:

(A) Increasing compression ratio

(B) Decreasing compression ratio

(C) Increasing cylinder size

(D) Decreasing crank length

Answer: A) Increasing compression ratio

25. The two-stroke engine completes a cycle in:

(A) One revolution

(B) Two revolutions

(C) Four revolutions

(D) Five revolutions

Answer: A) One revolution

26. Which component in nuclear power plants sustains chain reactions?

(A) Moderator

(B) Coolant

(C) Control rod

(D) Fuel rod

Answer: D) Fuel rod

27. Four-stroke engine completes a cycle in:

(A) One revolution

(B) Two revolutions

(C) Three revolutions

(D) Four revolutions

Answer: B) Two revolutions

28. The purpose of supercharging is to:

(A) Increase engine speed

(B) Increase air supply

(C) Increase fuel supply

(D) Decrease engine size

Answer: B) Increase air supply

29. The pressure ratio across a turbocharger is:

(A) 1–1.2

(B) 1.5–2.5

(C) 3–5

(D) 10–20

Answer: B) 1.5–2.5

30. Which nuclear reaction is used in power plants?

(A) Fusion

(B) Fission

(C) None

(D) Both

Answer: B) Fission

31. Camshaft in IC engine rotates at:

(A) half crankshaft speed

(B) same speed as crankshaft

(C) twice crankshaft speed

(D) variable speed

Answer: A) half crankshaft speed

32. The main types of internal combustion engines are:

(A) Two-stroke and Four-stroke

(B) Four-stroke and Eight-stroke

(C) Gas engine and Steam engine

(D) Spark plug and Control rod engines

Answer: A) Two-stroke and Four-stroke

33. In nuclear plants, radioactive waste is disposed by:

(A) Dumping at sea

(B) Controlled storage in sealed containers

(C) Burning

(D) Releasing in air

Answer: B) Controlled storage in sealed containers

34. The exhaust emissions from petrol engines mainly contain:

(A) CO_2, H_2O

(B) CO, NOx, hydrocarbons

(C) SO_2, NH_3

(D) N_2O, NO_3

Answer: B) CO, NOx, hydrocarbons

35. The cooling system in nuclear power plants uses:

(A) Air

(B) Water

(C) Lithium

(D) Mercury

Answer: B) Water

36. The exhaust manifold collects gases from:

(A) Carburetor

(B) Cylinders

(C) Radiator

(D) Injector

Answer: B) Cylinders

37. The starter motor in an IC engine helps in:

(A) Turning the flywheel

(B) Turning the piston

(C) Supplying air

(D) Cooling the engine

Answer: A) Turning the flywheel

38. The main advantage of nuclear power plant is:

(A) Large fuel requirement

(B) Large land requirement

(C) High power output

(D) High pollution

Answer: C) High power output

39. The air-fuel mixture in diesel engine is:

(A) Homogenous

(B) Heterogenous

(C) Constant

(D) Pre-mixed

Answer: B) Heterogenous

40. In a petrol engine the ignition system is:

(A) Spark ignition

(B) Compression ignition

(C) Both

(D) None

Answer: A) Spark ignition

41. Nuclear reactors are shielded to:

(A) Prevent radiation leakage

(B) Increase temperature

(C) Increase pressure

(D) Reduce fuel consumption

Answer: A) Prevent radiation leakage

42. The four-stroke engine uses how many valves per cylinder usually?

(A) 1

(B) 2

(C) 3

(D) 4

Answer: B) 2

43. The main cause of knocking in petrol engines is:

(A) Improper air-fuel ratio

(B) Early ignition

(C) High octane number

(D) Low compression ratio

Answer: A) Improper air-fuel ratio

44. In nuclear reactors, chain reactions are controlled by:

(A) Moderator

(B) Control rods

(C) Coolant

(D) All of these

Answer: B) Control rods

45. In a reciprocating engine, piston moves between:

(A) TDC and BDC

(B) Left and right

(C) Inlet and outlet

(D) Head and foot

Answer: A) TDC and BDC

46. The octane number is a measure of:

(A) Diesel quality

(B) Petrol's resistance to knocking

(C) Lubricating oil quality

(D) Engine speed

Answer: B) Petrol's resistance to knocking

47. Fissionable material in nuclear reactors is:

(A) U-235

(B) Pu-239

(C) Th-232

(D) All of these

Answer: D) All of these

48. The air intake in IC engines occurs during:

(A) Compression stroke

(B) Expansion stroke

(C) Intake stroke

(D) Exhaust stroke

Answer: C) Intake stroke

49. The efficiency of a nuclear power plant is typically:

(A) 10–15%

(B) 20–30%

(C) 30–40%

(D) 60–70%

Answer: C) 30–40%

50. Spark advance is used to:

(A) Increase engine speed

(B) Reduce knocking

(C) Increase octane number

(D) Increase exhaust temperature

Answer: B) Reduce knocking

51. Moderator in nuclear reactors is used to:

(A) Absorb neutrons

(B) Slow down neutrons

(C) Increase temperature

(D) Accelerate chain reaction

Answer: B) Slow down neutrons

52. The process of burning fuel in an engine is called:

(A) Combustion

(B) Fission

(C) Fusion

(D) Condensation

Answer: A) Combustion

53. Diesel fuel has higher:

(A) Octane number

(B) Cetane number

(C) Viscosity

(D) Calorific value

Answer: B) Cetane number

54. The pressure at which coolant boils in a pressurized cooling system of an IC engine is:

(A) Increased

(B) Decreased

(C) Zero

(D) Constant

Answer: A) Increased

55. The thickness of cylinder walls, in IC engines, depends on:

(A) Engine size

(B) Cylinder pressure

(C) Both A and B

(D) None

Answer: C) Both A and B

56. Uranium-235 can be used as fuel because it can:

(A) Undergo fission

(B) Undergo fusion

(C) Be compressed easily

(D) Be dissolved in water

Answer: A) Undergo fission

57. The piston rings serve to:

(A) Seal combustion chamber

(B) Increase heat loss

(C) Reduce friction

(D) Increase engine speed

Answer: A) Seal combustion chamber

58. The function of camshaft is to:

(A) Open and close valves

(B) Fill fuel tank

(C) Increase pressure

(D) Maintain temperature

Answer: A) Open and close valves

59. The main parts of a nuclear reactor are:

(A) Core, moderator, control rods, coolant

(B) Core, condenser, piston

(C) Moderator, piston, turbine

(D) Control rods, flywheel, cylinder

Answer: A) Core, moderator, control rods, coolant

60. The diesel fuel is injected in engine during:

(A) Intake stroke

(B) Compression stroke

(C) Expansion stroke

(D) Exhaust stroke

Answer: B) Compression stroke

61. Which is NOT a type of control rod material?

(A) Cadmium

(B) Boron

(C) Silver

(D) Copper

Answer: D) Copper

62. A two-stroke engine does not have:

(A) Intake valve

(B) Exhaust valve

(C) Camshaft

(D) Flywheel

Answer: C) Camshaft

63. The main loss in nuclear power plants is:

(A) Heat loss to cooling water

(B) Radiation loss

(C) Combustion loss

(D) Noise loss

Answer: A) Heat loss to cooling water

64. The lubricating system in IC engines performs:

(A) Reduce friction

(B) Remove heat

(C) Seal combustion chamber

(D) All of these

Answer: D) All of these

65. The expansion ratio in a four-stroke engine is:

(A) Same as compression ratio

(B) Double compression ratio

(C) Triple compression ratio

(D) Half compression ratio

Answer: A) Same as compression ratio

66. Neutron flux in nuclear reactor is measured by:

(A) GM counter

(B) Bolometer

(C) Thermocouple

(D) Spectrometer

Answer: A) GM counter

67. The temperature in the combustion chamber of a petrol engine is typically:

(A) 700°C

(B) 1200°C

(C) 2500°C

(D) 3400°C

Answer: B) 1200°C

68. The speed of a nuclear turbine is generally:

(A) 500 rpm

(B) 1500 rpm

(C) 3000 rpm

(D) 10000 rpm

Answer: C) 3000 rpm

69. Among fuels, energy density is greatest for:

(A) Natural gas

(B) Diesel

(C) Nuclear fuel

(D) Petrol

Answer: C) Nuclear fuel

70. The flywheel in IC engine stores:

(A) Energy during power stroke

(B) Energy during compression

(C) Coolant during combustion

(D) Lubricant during exhaust

Answer: A) Energy during power stroke

71. Diesel knock occurs due to:

(A) Sudden ignition of fuel

(B) Slow burning

(C) Low compression ratio

(D) Excess air supply

Answer: A) Sudden ignition of fuel

72. The main source of electricity in nuclear power plant is:

(A) Turbine generator

(B) Compressor

(C) Condenser

(D) Moderator

Answer: A) Turbine generator

73. The calorific value of diesel is:

(A) 42 MJ/kg

(B) 44 MJ/kg

(C) 46 MJ/kg

(D) 50 MJ/kg

Answer: C) 46 MJ/kg

74. The heat generated in IC engine during combustion is mostly:

(A) Used for power output

(B) Lost to cooling water and exhaust gases

(C) Used to evaporate fuel

(D) Used for lubricating oil

Answer: B) Lost to cooling water and exhaust gases

75. The moderator in fast breeder reactor is:

(A) Graphite

(B) Heavy water

(C) No moderator

(D) Air

Answer: C) No moderator

76. In multi-cylinder engines, cylinders are usually arranged in:

(A) Straight line

(B) V-shape

(C) Horizontally opposed

(D) All of these

Answer: D) All of these

77. Turbine blades in nuclear power plants are operated by:

(A) High pressure steam

(B) High pressure air

(C) Gas mixture

(D) Water vapor at ambient pressure

Answer: A) High pressure steam

78. The function of the battery in an IC engine is to:

(A) Supply electrical energy

(B) Store fuel

(C) Supply air

(D) Remove heat

Answer: A) Supply electrical energy

79. The maximum permissible temperature in nuclear reactor is limited to:

(A) 500°C

(B) 850°C

(C) 1200°C

(D) 2500°C

Answer: B) 850°C

80. The scavenging in two-stroke engine means:

(A) Removing exhaust gases

(B) Supplying air-fuel mixture

(C) Igniting fuel

(D) Cooling engine

Answer: A) Removing exhaust gases

81. The main function of crankshaft in IC engine is:

(A) Transmit power

(B) Ignite fuel

(C) Open valves

(D) Increase speed

Answer: A) Transmit power

82. In nuclear reactor, shutdown is achieved by:

(A) Inserting control rods fully

(B) Increasing temperature

(C) Decreasing pressure

(D) Changing coolant

Answer: A) Inserting control rods fully

83. Heat balance sheet in IC engine shows:

(A) Distribution of heat supplied

(B) Power output only

(C) Fuel consumption rate

(D) Exhaust pressure only

Answer: A) Distribution of heat supplied

84. The use of turbocharger in engine increases:

(A) Air intake

(B) Fuel efficiency

(C) Power output

(D) All of these

Answer: D) All of these

85. The thermal efficiency of a good IC engine is:

(A) 10–15%

(B) 30–40%

(C) 45–55%

(D) 60–70%

Answer: B) 30–40%

86. The coolant in nuclear reactors removes:

(A) Fission heat

(B) Combustion heat

(C) Pressure loss

(D) None

Answer: A) Fission heat

87. Diesel engine fuel is ignited by:

(A) Spark plug

(B) Heat of compression

(C) Electric coil

(D) Injector

Answer: B) Heat of compression

88. In IC engines, the exhaust stroke removes:

(A) Burned gases

(B) Air only

(C) Fuel only

(D) Coolant

Answer: A) Burned gases

89. In nuclear reactor, the energy released per fission of U-235 is about:

(A) 100 eV

(B) 200 MeV

(C) 1 keV

(D) 50 MeV

Answer: B) 200 MeV

90. The lubricating system of IC engine reduces:

(A) Wear and tear

(B) Friction

(C) Heat generation

(D) All of these

Answer: D) All of these

91. The main function of connecting rod in engine is to:

(A) Connect piston to crankshaft

(B) Connect cylinder to piston

(C) Connect flywheel to crankshaft

(D) Connect exhaust to cylinder

Answer: A) Connect piston to crankshaft

92. The highest temperature in nuclear power plant is at:

(A) Reactor core

(B) Turbine blade

(C) Condenser

(D) Moderator

Answer: A) Reactor core

93. Expansion ratio is defined as:

(A) Volume after combustion/Volume before combustion

(B) Volume after exhaust/Volume before intake

(C) Cylinder pressure/Atmospheric pressure

(D) Engine speed/Crankshaft speed

Answer: A) Volume after combustion/Volume before combustion

94. In a four-stroke engine, the sequence of strokes is:

(A) Intake, compression, expansion, exhaust

(B) Intake, exhaust, expansion, compression

(C) Compression, intake, exhaust, expansion

(D) Compression, expansion, intake, exhaust

Answer: A) Intake, compression, expansion, exhaust

95. The main reason for efficiency loss in nuclear power plants is:

(A) Heat loss to environment

(B) Radiation loss

(C) Poor fuel quality

(D) Low coolant flow

Answer: A) Heat loss to environment

96. The common type of nuclear reactor is:

(A) Pressurized water reactor (PWR)

(B) Gas-cooled reactor

(C) Boiling water reactor (BWR)

(D) All of these

Answer: D) All of these

97. In IC engine, scavenging is done to:

(A) Replace exhaust gases with fresh charge

(B) Increase pressure

(C) Decrease temperature

(D) Increase fuel supply

Answer: A) Replace exhaust gases with fresh charge

98. The control rod inserted fully in nuclear reactor causes:

(A) Power increase

(B) Power decrease

(C) Full shutdown

(D) Fuel burning

Answer: C) Full shutdown

99. The valve timing diagram is important for:

(A) Efficient gas exchange

(B) Increasing engine speed

(C) Reducing engine load

(D) Reducing temperature loss

Answer: A) Efficient gas exchange

100. The coolant flow in nuclear plants is controlled by:

(A) Control rods

(B) Pumps

(C) Moderator

(D) Reactor core

Answer: B) Pumps

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