

POWER PLANT ENGINEERING MCQ

1. Enriched uranium is required as a fuel in a nuclear reactor, if light water is used as moderator and coolant, because light water has

- (A) High neutron absorption cross-section
- (B) Low moderating efficiency
- (C) High neutron scatter cross-section
- (D) Low neutron absorption cross-section

2. The efficiency of a nuclear power plant in comparison to conventional and nuclear consideration is

- (A) Higher cost of nuclear fuel
- (B) High initial cost
- (C) High heat rejection in condenser
- (D) Lower temperature and pressure conditions

3. The control rods in the control system of nuclear reactors are used to

- (A) Absorb excess neutrons
- (B) Control fuel consumption
- (C) Control temperature
- (D) All of these

4. Electron volt is the unit of

- (A) Atomic power

- (B) Energy
- (C) Voltage
- (D) Radio activity

5. A moderator, in nuclear power plants, is a medium introduced into the fuel mass in order to

- (A) Slow down the speed of fast moving neutrons
- (B) Control the reaction
- (C) Reduce the temperature
- (D) Extracts heat from nuclear reaction

6. One gram of uranium will produce energy equivalent to approximately

- (A) 1 tonne of high grade coal
- (B) 4.5 tonnes of high grade coal
- (C) 10 tonnes of high grade coal
- (D) 100 tonnes of high grade coal

7. Which of the following type of pump is used in liquid metal cooled reactor for circulation of liquid metal

- (A) Centrifugal
- (B) Axial
- (C) Reciprocation
- (D) Electromagnetic

8. Where reactor operation is designed with fast neutrons such as in reactors using highly enriched fuel, the moderator used is

- (A) Heavy water

- (B) Graphite
- (C) Carbon dioxide
- (D) No moderator is needed

Answer: Option D

9. The nuclear energy is measured as

- (A) MeV
- (B) Curie
- (C) Farads
- (D) MW

10. Isotopes of same elements have

- (A) Same atomic number and different masses
- (B) Same chemical properties but different atomic numbers
- (C) Different masses and different atomic numbers
- (D) Different chemical properties and same atomic numbers

11. A boiling water reactor uses following as fuel

- (A) Enriched uranium
- (B) Plutonium
- (C) Thorium
- (D) U

12. Which of the following statement is correct regarding the features of a Breeder reactor?

- (A) It produces more fuel than it consumes
- (B) It requires highly enriched fuel
- (C) It requires liquid sodium metal as moderator
- (D) All of the above

13. In nuclear fission each neutron that causes fission releases

- (A) No new neutron
- (B) At least one new neutron
- (C) One new neutron
- (D) More than one new neutron

14. Artificial radioactive isotopes find application in

- (A) Power generation
- (B) Nucleonic devices
- (C) Nuclear fission
- (D) Medical field

15. Each fission of U_{235} produces on the average fast neutrons as a product of reaction.

(A) 2.46
 (B) 24.6
 (C) 246
 (D) 2460

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(1) Answer: Option B (2) Answer: Option D (3) Answer: Option A (4) Answer: Option B (5) Answer: Option A (6) Answer: Option B (7) Answer: Option D (8) Answer: Option D (9) Answer: Option A (10) Answer: Option B (11) Answer: Option A (12) Answer: Option D (13) Answer: Option D (14) Answer: Option D (15) Answer: Option A

16. The process by which a heavy nucleus is split into two light nuclei is known as

- (A) Splitting
- (B) Fission
- (C) Fusion
- (D) Disintegration

17. Which of the following is more appropriate for a moderator? One which

- (A) Does not absorb neutrons
- (B) Absorbs neutrons
- (C) Accelerates neutrons
- (D) Eats up neutrons

18. A nuclear reactor is said to be critical when the neutron population in the reactor core is

- (A) Rapidly increasing leading to the point of explosion
- (B) Decreasing from the specified value
- (C) Reduced to zero
- (D) Constant

19. The most commonly used moderator in nuclear plants is

- (A) Heavy water
- (B) Concrete and bricks
- (C) Graphite and concrete
- (D) Graphite

20. Reactors for propulsion applications are designed for

- (A) Any form of uranium
- (B) Natural uranium
- (C) Enriched uranium
- (D) Plutonium

21. The following present serious difficulty in designing reactor shield

- (A) Alpha particles
- (B) Beta particles
- (C) Thermal neutrons
- (D) Fast neutrons and gamma rays

22. Ferrite material is

- (A) The most fissionable material
- (B) The basic fuel for nuclear paints
- (C) Basic raw material for nuclear plants
- (D) The material which absorbs neutrons and undergoes spontaneous changes leading to the formation of fissionable material

23. Reflector in nuclear power plants _____ neutron leakage.

- (A) Increases
- (B) Decreases
- (C) Have no effect on
- (D) None of these

24. Effective moderators are those materials which contain

- (A) Light weight atoms
- (B) Heavy weight atoms
- (C) Critical atoms
- (D) Zero weight atoms

Correct Answer

25. The fuel needed, with reflector in nuclear power plant, in order to generate sufficient neutrons to sustain a chain reaction, would be

- (A) More
- (B) Less
- (C) Same
- (D) Zero

Correct Answer

26. Nuclear reactors are used

- (A) To produce heat for thermoelectric power
- (B) To produce fissionable material
- (C) To propel ships, submarines, aircrafts
- (D) All of these

Correct Answer

27. The main interest of shielding in nuclear reactor is protection against

- (A) X-rays
- (B) Infrared rays
- (C) Neutrons and gamma rays
- (D) Electrons

Correct Answer

28. Breeder reactors employ liquid metal coolant because it

- (A) Acts as good moderator
- (B) Produces maximum steam
- (C) Transfers heat from core at a fast rate
- (D) Breeds neutrons

Correct Answer

29. The coolant used in boiling water reactor is

- (A) CO_2
- (B) Pressurised water

- (C) Mixture of water and steam
- (D) Liquid metal

[Correct Answer](#)

[30. A moderator](#)

- (A) Absorbs neutrons
- (B) Does not absorb neutrons
- (C) Accelerates neutrons
- (D) None of these

[Correct Answer](#)

[View All Answers](#)

(16) Answer: Option B (17) Answer: Option A (18) Answer: Option D (19) Answer: Option D (20) Answer: Option C (21) Answer: Option D (22) Answer: Option D (23) Answer: Option B (24) Answer: Option A (25) Answer: Option B (26) Answer: Option D (27) Answer: Option D (28) Answer: Option C (29) Answer: Option C (15) Answer: Option B

31. A nuclear fission is initiated when the critical energy as compared to neutron binding energy of the atoms is

- (A) Same
- (B) More
- (C) Less
- (D) There is no such criterion

32. In a thermal power plant, coal from the coal handling plant is moved to the boiler bunker through a

- (A) Belt conveyor
- (B) Bucket conveyor
- (C) Fork lift truck
- (D) Overhead crane

33. In the breeder reactors the generation of new fissionable atom is

- (A) At the lower rate than the consumption
- (B) At a higher rate than the consumption
- (C) At an equal rate of the consumption
- (D) Depends on other considerations

34. The most practical fuel for a thermonuclear reactor, both from economical and nuclear consideration is

- (A) Plutonium
- (B) Uranium
- (C) Deuterium
- (D) Thorium

35. A power plant giving least running cost of production of electrical power is

- (A) Steam power plant
- (B) Gas turbine power plant
- (C) Hydro electric power plant
- (D) Nuclear power plant

36. The breeding gain in case of thermal breeder reactor as compared to fast breeder reactor is

- (A) Same
- (B) Lower
- (C) Higher
- (D) Unity

37. The energy produced by a thermal reactor of same size as a breeder reactor is

- (A) Almost same
- (B) Slightly more
- (C) Slightly less
- (D) Much less

38. Which of the following nuclear reactor does not need a heat exchanger for generation of steam?

- (A) Gas cooled
- (B) Liquid metal cooled
- (C) Pressurised water
- (D) Boiling water

39. Reactors designed for propulsion applications are designed for

- (A) Natural uranium
- (B) Enriched uranium
- (C) Pure uranium
- (D) Any type of uranium

Correct Answer

40. The primary fuel used in nuclear power plants is

- (A) U_{235}
- (B) U_{238}
- (C) Pu_{239}
- (D) Pu_{233}

Correct Answer

41. In natural uranium, the constituents of three naturally occurring isotopes are

- (A) $U_{234} = 0.006\%$, $U_{235} = 0.712\%$ and $U_{238} = 99.282\%$

(B) $U_{234} = 0.712\%$, $U_{235} = 0.006\%$ and $U_{238} = 99.282\%$
 (C) $U_{234} = 99.282\%$, $U_{235} = 0.006\%$ and $U_{238} = 0.712\%$
 (D) $U_{234} = 0.006\%$, $U_{235} = 99.282\%$ and $U_{238} = 0.712\%$

Correct Answer

42. The commonly used material for shielding is

(A) Lead or concrete
 (B) Lead and tin
 (C) Graphite or cadmium
 (D) Thick galvanized sheets

Correct Answer

43. When a reactor becomes critical, then the production of neutrons is

(A) Infinite
 (B) Zero
 (C) Exactly balanced by the loss of neutrons through leakage
 (D) Initiated

Correct Answer

44. A nuclear unit becoming critical means

(A) It is generating power to rated capacity
 (B) It is capable of generating much more than rated capacity
 (C) There is danger of nuclear spread
 (D) Chain reaction that causes automatic splitting of the fuel nuclei has been established

Correct Answer

45. The predominant isotope of the naturally occurring element is

(A) U_{235}
 (B) U_{238}
 (C) Pu_{233}

(D) Pu_{239}
Correct Answer

[View All Answers](#)

(31) Answer: Option B (32) Answer: Option A (33) Answer: Option B (34) Answer: Option C (35) Answer: Option D (36) Answer: Option B (37) Answer: Option D (38) Answer: Option D (39) Answer: Option B (40) Answer: Option A (41) Answer: Option A (42) Answer: Option A (43) Answer: Option C (44) Answer: Option D (45) Answer: Option B

46. The function of control rods in nuclear plants is to

- (A) Control temperature
- (B) Control radioactive pollution
- (C) Control absorption of neutron
- (D) Control fuel consumption

47. Reflector in nuclear plants is used to

- (A) Return the neutrons back into the core
- (B) Shield the radioactivity completely
- (C) Check pollution
- (D) Conserve energy

48. A fission chain reaction in uranium can be developed

- (A) By increasing the contents of U_{235}
- (B) By slowing down fast neutrons so that U_{235} fission continues by slow neutron
- (C) Both (A) and (B)
- (D) None of these

49. Pick up the wrong statement

- (A) In a heterogeneous or solid fuel reactor, the fuel is mixed in a regular pattern within moderator
- (B) Slow or thermal neutrons have energy of the order of 0.025 eV
- (C) Fast neutrons have energies above 1000 eV
- (D) Fast reactor uses moderator

50. Moderator in nuclear plants is used to

- (A) Reduce temperature
- (B) Extract heat from nuclear reaction
- (C) Control the reaction
- (D) Cause collision with the fast moving neutrons to reduce their speed

51. U_{233} is produced

- (A) Artificially
- (B) As basic raw material
- (C) When thorium is irradiated by neutrons
- (D) By fission of U_{238}

52. Solid fuel for nuclear reactions may be fabricated into various small shapes such as

- (A) Plates
- (B) Pallets
- (C) Pins
- (D) Any one of the above

53. In fast breeder reactors

- (A) Any type of moderator can be used
- (B) Graphite is used as the moderator
- (C) Heavy water is used as the moderator
- (D) Moderator is dispensed with

54. Uranium has isotopes

- (A) U_{234}
- (B) U_{235}
- (C) U_{238}
- (D) All of these

Correct Answer

55. Each fission of U_{235} produces following number of fast neutrons per fission

- (A) 1 neutron
- (B) 3 neutrons
- (C) 1, 2 neutrons
- (D) 2 neutrons

Correct Answer

56. Enriched uranium is one in which

- (A) Percentage of U_{235} has been artificially increased
- (B) Percentage of U has been artificially increased
- (C) Percentage of U_{234} has been artificially increased
- (D) Extra energy is pumped from outside

Correct Answer

57. A fission chain reaction in uranium can be developed by

- (A) Slowing down fast neutrons so that U_3 fission continues by slow motion neutrons
- (B) Accelerating fast neutrons
- (C) Absorbing all neutrons

(D) Using moderator

[Correct Answer](#)

58. The energy released during the fission of one atom of Uranium 235 in million electron volts is about

(A) 100

(B) 200

(C) 300

(D) 400

[Correct Answer](#)

59. Boiling water reactor employs

(A) Boiler

(B) Direct cycle of coolant system

(C) Double circuit system of coolant cycle

(D) Multi passes system

[Correct Answer](#)

60. The efficiency of a nuclear power plant in comparison to a conventional thermal power plant is

(A) Same

(B) More

(C) Less

(D) May be less or more depending on size

[Correct Answer](#)

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(46) Answer: Option C (47) Answer: Option A (48) Answer: Option C (49) Answer: Option D (50)

Answer: Option D (51) Answer: Option C (52) Answer: Option D (53) Answer: Option D (54)

Answer: Option D (55) Answer: Option D (56) Answer: Option A (57) Answer: Option A (58)

Answer: Option B (59) Answer: Option B (15) Answer: Option C