

Sample Questions
FOURTH CLASS PART A

1. One cubic metre is equal to:

- | | |
|----------------------|---------------------------|
| A. 1 cubic decimetre | D. 100 cubic decimetres |
| B. 1000000 litres | E. 1000 cubic centimetres |
| C. 1000 litres | |

Answer: C

2. One watt is equal to:

- | | |
|-------------------|--------------|
| A. 1 joule | D. 1 ampere |
| B. 1 newton metre | E. 1 coulomb |
| C. 1 joule/s | |

Answer: C

3. Which of the following numbers are integers:

- | | |
|---------------|------------------|
| 1. 5 | 3. 15 |
| 2. 10 | 4. 25 |
| A. 1, 2 and 3 | D. 1, 2, 3 and 4 |
| B. 1, 3 and 4 | E. 1 and 2 |
| C. 2, 3 and 4 | |

Answer: D

4. Which of the following are prime numbers?

- | | |
|------------------|---------------------|
| 1. 2 | 4. 13 |
| 2. 5 | 5. 29 |
| 3. 7 | |
| A. 1, 2, 3 and 5 | D. 1, 2, 3 and 4 |
| B. 1, 3 and 4 | E. 1, 2, 3, 4 and 5 |
| C. 2, 3 and 4 | |

Answer: E

5. Solve: $b^2 \times b^{-2}$

- | | |
|--------------|----------|
| A. b | D. $-4b$ |
| B. $b^4 + 1$ | E. b^4 |
| C. 1 | |

Answer: C

6. Distance is:

- | | |
|--------------------------------|---------------------------------------|
| A. always a vector quantity | D. always measured in a circular path |
| B. a scalar quantity | E. velocity /time |
| C. measured in a straight line | |

Answer: B

7. When a simply supported beam is loaded with a mass of 1 tonne acting at the centre of the beam, the reaction at each end of the beam is:

- A. 0.4905 kN
- B. 9.81 kN
- C. 49.05 kN
- D. 98.1 kN
- E. 4.905 kN

Answer: E

8. An example of a vector quantity is:

- A. speed
- B. velocity
- C. time
- D. magnitude
- E. distance

Answer: B

9. Thermodynamics is that branch of physics which deals with:

- A. the measurement of heat
- B. the transfer of heat into other forms of energy
- C. the relationship between temperature and the electrical condition in metals
- D. the conversion of energy into heat
- E. the movement of heat through solids

Answer: B

10. When the Fahrenheit reading is 312°F the Celsius reading is:

- A. 148.6°C
- B. 155.5°C
- C. 156.26°C
- D. 157.39°C
- E. 158.8°C

Answer: B

11. The temperature of a body is a measure of:

- A. the quantity of heat in the body
- B. the quantity of cold in the body
- C. the quality of heat in the body
- D. the quality of cold in the body
- E. the quantity of electrons in the body

Answer: C

12. The evaporation of a liquid:

- A. takes place at any temperature.
- B. is a physical change
- C. increases as the pressure upon the liquid increases.
- D. is a chemical change.
- E. all of the above.

Answer: B

13. Where more than one view is shown in a drawing,
A. width is common to the front and top views.
B. height is common to the front and side views.
C. depth is common to the top and side views.
D. hidden lines are used.
E. all of the above
Answer: E
14. A power plant log book:
A. should record all important events which occur during a shift and be signed by the person in charge of the shift
B. should record only start up and shut down dates of equipment
C. should not include information which is recorded elsewhere
D. should be maintained and signed by the chief engineer only
E. should record all important events which occur during a shift and be signed by the chief engineer and the shift engineer
Answer: A
15. Section 7, "Rules for Care of Power Boilers" of the ASME Code Book are:
A. rules that are strictly enforced by the ASME
B. suggested rules to promote safety in boiler operation
C. applicable only to large high pressure boilers
D. rules developed to produce best economy of operations
E. rules that all boiler operators must follow
Answer: B
16. When working inside a boiler the maximum voltage of the lights you must use is:
A. 12 volts
B. 60 volts
C. 110 volts
D. 220 volts
E. 220 volts or less provided you are grounded
Answer: A
17. A safety committee is responsible for:
A. repairing safety devices on equipment
B. supplying special courses
C. setting down the safety policy of the plant
D. promoting all safety aspects in the plant
E. making sure management responds to safety concerns
Answer: D
18. Power house accidents may involve electrical or mechanical hazards. To reduce mechanical hazards the operator should:
A. open all valves as quickly as possible to increase pressure
B. shut all valves as quickly as possible to maintain pressure
C. open and shut all valves under full load to minimize leakage
D. open and shut all valves slowly, allowing pressure to equalize
E. open and shut all valves under no load to save wear on the valves
Answer: D

19. A lock-out procedure for a boiler, pressure-vessel, pump or electrical equipment being repaired or serviced is to:
- A. lock and tag the control device in an inoperative position
 - B. lock only the main disconnect so that repairs can be performed
 - C. lock and tag only equipment that can be remotely started
 - D. tag and lock equipment but leave key in main office so that maintenance can be performed
 - E. tag and lock equipment as approved by the safety committee

Answer: A

20. M.S.D.S. means;
- A. Material Specification Data System
 - B. Material Specification Data Sheet
 - C. Manufacturers Specification Data Sheet
 - D. Manufacturers Safety Data Sheet
 - E. Material Safety Data Sheet

Answer: E

21. Three different extinguishing media used on fires are:
- A. dry powder, foam, oxygen.
 - B. water, dry powder, carbon dioxide.
 - C. dry powder, carbon monoxide, water.
 - D. foam, water, sulphur dioxide.
 - E. sand, water and hydrogen.

Answer: B

22. Which of the following extinguishers would ordinarily be used to combat a class "C" fire?
- | | |
|-------------------|-----------------|
| 1. carbon dioxide | 3. dry chemical |
| 2. foam | 4. Water |
-
- | | |
|---------|---------|
| A. 1, 2 | D. 1, 4 |
| B. 1, 3 | E. 2, 4 |
| C. 2, 3 | |

Answer: B

23. You notice one of the men you are working with lying on the ground. If you find that his breathing has stopped you would:
- A. give him something to drink and then send for help
 - B. start artificial respiration immediately and summon help
 - C. send for a doctor
 - D. cover him with a blanket and run for help
 - E. turn the person over into the recovery position

Answer: B

24. The first action of plant personal upon finding an unplanned environmental excursion is:
- A. report the incident to OH&S
 - B. report the incident to Provincial Environmental Authorities
 - C. report the incident to E.R.C.B.
 - D. minimize and control the release
 - E. alert the remaining plant personnel

Answer: D

25. The most proficient method of dealing with environmental impacts due to wastes is to:
- A. avoid the generation of hazardous waste
 - B. ensure it conforms with Transport of Dangerous Goods Act
 - C. ensure that disposal of material waste conforms with required legislation
 - D. conduct periodic inspections of the company used to dispose of hazardous waste
 - E. use long term storage

Answer: A

26. Metals that are very soft and easily worked are said to be:

- A. ductile
- B. elastic
- C. plastic
- D. malleable
- E. tough

Answer: C

27. Case hardening of low carbon steel produces:

- A. a high carbon inner core and low carbon outer surface
- B. a high carbon inner core and high carbon outer surface
- C. a low carbon inner core and low carbon outer surface
- D. a low carbon inner core and high carbon inner surface
- E. a low carbon inner core and high carbon outer surface

Answer: E

28. Relative to babbit, the greater amount of lead it contains:

- A. the greater will be the amount of tin
- B. the less load it will support
- C. the shaft can operate at higher speed and light loads
- D. the greater load it will support at slow speed
- E. the greater chance of brittle failure

Answer: D

29. In order to convey fluid from one storage tank to another:

- A. valves are required
- B. pumps are necessary
- C. drains are required
- D. piping is required
- E. siphon breakers are required

Answer: D

30. Commercial pipe is made in standard sizes each having several different:
1. weights
 2. colours
 3. thicknesses
 4. shapes
 5. threads

- A. 1, 5
B. 2, 3, 4
C. 1, 3
D. 4, 5
E. 1, 2, 3, 4, 5

Answer: C

31. A check valve is a valve that:

- A. is required on all boilers
B. allows flow in two directions
C. allows flow at regular intervals
D. does not allow any flow at all
E. allows flow in one direction only

Answer: E

32. When steam is first being introduced into a piping system, it is important that:

- A. all valves be wide open
B. all drains be closed
C. all valves be closed
D. all condensate water is drained
E. all by-pass valves are closed

Answer: D

33. Beading the tube ends on a fire tube boiler:

1. is done with a sledgehammer
2. makes the tube act as a stay
3. reduces oxygen pitting
4. prevents overheating and splitting of the tube end

- A. 1, 3
B. 2, 3
C. 2, 4
D. 1, 4
E. 3, 4

Answer: C

34. In early boilers, fire walls were constructed of brick. Today this method has been replaced by the use of:

- A. baffles
B. steel casing
C. tubes to form the furnace walls
D. plastic insulation
E. cement like refractory material

Answer: C

35. Convection superheaters are located:
- A. away from the fire
 - B. by the burner
 - C. in the radiant zone
 - D. before the superheaters
 - E. at the back end of the boiler next to the blowdown tank

Answer: A

36. Generally packaged boilers are:
- A. top supported
 - B. bottom-supported
 - C. externally fired
 - D. horizontal return tubular
 - E. oil fired boilers

Answer: B

37. The advantage of a multi-pass firetube boiler is:
- A. larger water space
 - B. stronger construction
 - C. increased heat transfer
 - D. larger gas volume
 - E. high heat content in the flue gases at the stack

Answer: C

38. If a boiler has 60 m² of heating surface, it must have how many safety valves:
- A. at least two
 - B. at least one
 - C. only three
 - D. no more than two
 - E. one with enough capacity

Answer: A

39. A stop valve is allowed between the safety valve and the boiler drum when:
- A. the stop valve is locked in the open position
 - B. there is more than one safety valve
 - C. a rupture disc is placed between the stop valve and the safety valve
 - D. no valve is allowed at any time
 - E. the pipe diameter is less than 2"

Answer: D

40. The chemical symbol for carbon monoxide is:
- A. C
 - B. CaCO₃
 - C. CO
 - D. CO₂
 - E. HCO₃

Answer: C

41. Insufficient air for combustion will result in:

1. carbon in flue gases
2. high oxygen reading in flue gases
3. low oxygen reading in flue gases
4. high CO in flue gases
5. higher than normal flue gas temperature

A. 1, 2, 3

D. 2, 3, 4

B. 3, 4, 5

E. 1, 2, 3, 4

C. 1, 3, 4

Answer: C

42. When you first notice that the water level in the boiler gauge glass can no longer be seen, it is best to:

- A. start the stand-by feed pump or injector
- B. shut off the boiler fuel supply
- C. close the main steam valve
- D. ensure the glass is not over filled
- E. open the boiler drain at once

Answer: D

43. Modulating combustion controls:

- A. regulate the steam and feedwater supply
- B. regulate the fuel and air supplies
- C. control the oil atomizer
- D. control the back draft damper
- E. modulate the water supply proportionally to the air supply

Answer: B

44. When lighting up a steam or air atomizing burner ;

1. admit steam or air to the burner before opening the burner fuel valve
2. open burner fuel valve before admitting steam or air
3. establish an adequate ignition source before opening the fuel valve.
4. adjust the draft to provide a positive furnace pressure

A. 1 and 2

D. 2 and 4

B. 1 and 3

E. 3 and 4

C. 2 and 3

Answer: B

45. The most important step before lighting a gas fired boiler is to:

- A. make sure the boiler is purged.
- B. make sure the water level is at the normal operating level.
- C. have all the manhole covers shut.
- D. have all the fuel valves ready for start up.
- E. must make sure that steam drum vent valves are wide open.

Answer: A

46. The major purpose of a blow-off tank is to:
- A. purify and cool the water before returning it to the feedwater tank.
 - B. neutralize chemical impurities before pouring the water into the sewer.
 - C. filter out mud and sediment before returning the water to the boiler.
 - D. reduce the pressure and temperature of the water before entering the sewer.
 - E. collect blowdown water for recirculation and reuse in boiler.

Answer: D

47. Corrosion products in feedwater can cause:
- A. slag deposits in superheaters
 - B. tube failure
 - C. increased steam pressure
 - D. increase in boiler efficiency
 - E. damage to the combustion areas

Answer: B

48. The zeolite inside a water softener is used to:
- A. regenerate the brine solution
 - B. rinse the softened water
 - C. exchange sodium for calcium and magnesium
 - D. exchange soda for calcium and magnesium
 - E. re-energize the hydrogen in the water

Answer: C

49. Turbid water should not be passed through a zeolite bed because the accumulated deposits will coat the:
- A. exchange material
 - B. filter medium
 - C. anthracite
 - D. sludge deposits
 - E. sand

Answer: A

50. To determine the amount of dissolved solids in boiler feedwater you would test the:
- A. alkalinity of the water
 - B. conductance of the water
 - C. PH value of the water
 - D. hardness of the water
 - E. negativity of the water

Answer: B