

Sample Questions FOURTH CLASS PART B

1. Impulse turbines:

1. have a velocity increase through the nozzles
2. blades have the angle of inlet the same as the outlet
3. could have more than one set of blades
4. are used for low pressure steam only
5. may not require a thrust bearing

A. 1, 2, 3, 4

D. 1, 2, 3, 5

B. 2, 3

E. 2, 3, 4

C. 1, 3, 4, 5

Answer: D

2. Impulse turbines:

- A. have a velocity drop through the nozzle
- B. have no pressure drop through the moving blades
- C. use low pressure steam only
- D. are of the single stage design only
- E. are used for high pressure steam applications

Answer: B

3. Dummy pistons:

1. are usually installed on reaction turbines only
2. are used to increase the turbine horsepower
3. are usually installed on the high pressure end of the turbine
4. balance out the thrust on the rotor

A. 1, 2

D. 1, 2, 4

B. 1, 2, 3

E. 2, 3, 4

C. 1, 3, 4

Answer: C

4. Cooling towers:

1. remove the heat from the condensate
2. should use water treatment
3. prevent thermal pollution of rivers and lakes
4. cannot be used during winter periods
5. remove the sensible heat of the steam in the condenser

A. 2, 3

D. 3, 4, 5

B. 1, 3, 4

E. 2, 3, 4

C. 1, 3, 4, 5

Answer: A

5. Generally, steam turbine blades are made of:
- A. cast iron
 - B. brass
 - C. carbon steel
 - D. stainless steel
 - E. bronze
- Answer: D*
6. The purpose of a regenerator on a gas turbine is to:
- A. regenerate the fuel
 - B. cool the combustion air
 - C. improve the cycle efficiency
 - D. start the compressor
 - E. produce more electricity
- Answer: C*
7. When starting-up a reciprocating pump:
- A. the discharge valve should be closed
 - B. the discharge valve should be open
 - C. the pump should be filled with air
 - D. the pump should be at the correct temperature
 - E. the suction valve must be closed
- Answer: B*
8. Priming a water pump means:
- A. raising the suction line to the level of the water
 - B. removing the foot valve to allow the water to flow through
 - C. closing the discharge valve before starting the motor
 - D. filling the pumps casing and suction line with water
 - E. painting the internals of a pump
- Answer: D*
9. What size of packing should be used to repack a pump gland having an 8.6 cm stuffing box bore and 6.7 cm pump shaft diameter?
- A. 0.5 cm
 - B. 1.9 cm
 - C. 0.95 cm
 - D. 1.6 cm
 - E. 2.0 cm
- Answer: C*
10. A sliding vane pump is termed:
- A. a reciprocating pump
 - B. a centrifugal pump
 - C. a rotary pump
 - D. a double acting pump
 - E. a slide pump
- Answer: C*
11. Greases are commonly a mixture of mineral oil and:
- A. carbon powder
 - B. soap
 - C. graphite
 - D. synthetic oils
 - E. natural oils
- Answer: B*

12. Causes of anti-friction bearing failures are:

- | | |
|---------------------|-------------------------------|
| 1. improper fitting | 3. high operating temperature |
| 2. false brinelling | 4. poor quality lubricant |

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

Answer: D

13. The pour point of an oil is:

- A. the lowest pressure at which the oil will flow
- B. the lowest neutralization number of the oil
- C. the highest temperature at which the oil will flow
- D. the lowest pressure at which oil will stop to flow
- E. the lowest temperature at which oil will flow

Answer: E

14. A basic law of electricity is, unlike charges attract each other and like charges:

- | | |
|-----------------------|----------------------|
| A. repel each other | D. are neutralized |
| B. hold each other | E. impact each other |
| C. attract each other | |

Answer: A

15. The value of the current flow in an electric circuit, where the voltage is 12 volts and the resistance is 3 ohms is:

- | | |
|-----------------|----------------|
| A. 4 watts | D. 4 amperes |
| B. 36 amperes | E. 2.5 amperes |
| C. 0.25 amperes | |

Answer: D

16. The voltmeter is placed:

- | | |
|---------------------------------|--------------------------------------|
| A. in series with the ammeter | D. in series with the circuit |
| B. in parallel with the circuit | E. as close to a battery as possible |
| C. across the synchroscope | |

Answer: B

17. Isolated electrical power lines:

- A. are always closed
- B. are always visible
- C. require double insulation
- D. may have an induced or static electrical charge
- E. have no potential

Answer: D

18. 10 metres of wire of uniform cross sectional area has a resistance of 20 ohms. If the length of the wire is increased to 500 metres the resistance will be:

- A. 1 000 ohms
- B. 0.4 ohms
- C. 25 ohms
- D. 250 ohms
- E. 4 ohms

Answer: A

19. Regarding alternating current systems, starting from zero and rising to a maximum positive or negative value and returning to zero, is known as:

- A. a cycle
- B. the frequency
- C. one half cycle
- D. an open circuit
- E. a sine wave

Answer: C

20. The rotating field of an AC alternator is obtained by exciting the windings on the rotor with:

- A. AC power
- B. stator current
- C. magnetic particles
- D. DC power
- E. interpoles

Answer: D

21. A commutator would be found in:

- A. an AC generator
- B. an induction motor
- C. a DC generator
- D. a wound rotor motor
- E. a synchronous motor

Answer: C

22. The Bourdon tube is often shaped in the form of a "C", having an arc span of about:

- A. 180 degrees
- B. 360 degrees
- C. 200 degrees
- D. 270 degrees
- E. 225 degrees

Answer: D

23. In a variable area flow meter the differential pressure:

- A. is constant
- B. changes directly as the area changes
- C. changes inversely as the area changes
- D. changes to the square root of the area changes
- E. changes inversely to the square root of the area

Answer: A

24. The low water cut off can be tested by:

- A. raising steam pressure
- B. shutting off the fire
- C. shutting off the feedwater
- D. opening the safety valve
- E. draining the steam drum

Answer: C

25. A hot water boiler is protected from over pressure by means of:
- A. a safety pop valve
 - B. a safety relief valve
 - C. an expansion valve
 - D. an air release valve
 - E. the expansion tank

Answer: B

26. Your boiler is operated with automatic water feeders. If the boiler suddenly requires an increase in water treatment, what should you look for?
- A. see if the chemical pump has stopped
 - B. check for a loss of water
 - C. check to see if the chemical supplier has sent the wrong chemicals
 - D. Nothing. Simply increase the pump stroke to put more chemicals into the system and protect it from excessive raw water make-up
 - E. check the city water supply to find out if the water quality has changed

Answer: B

27. The blow down valve of a steam heating boiler must:
- A. Be installed in series with the safety valve,
 - B. Be installed in the steam space,
 - C. Regulate the feedwater,
 - D. Be installed at the lowest point of the boiler,
 - E. Be welded to outlet piping.

Answer: D

28. The purpose of a cushion tank is to:
- A. store heat while the boiler is firing
 - B. allow for the expansion of water in the system
 - C. prevent the system from overflowing
 - D. to prevent the water in the system from freezing
 - E. eliminate water hammer when steam load is low

Answer: B

29. The purpose of fins on a convector tube is to:
- A. strengthen the tube
 - B. prevent rupture
 - C. increase heat transfer
 - D. accumulate warm air
 - E. make it lighter in construction

Answer: C

30. Steam is prevented from leaking out around the valve stem of a packless radiator valve with the use of:
- A. A seat
 - B. A diaphragm
 - C. A spring
 - D. An outside screw
 - E. A collar

Answer: B

31. Two element feedwater control:
- A. measures water level and steam flow
 - B. measures water flow and steam flow
 - C. measures water level and steam level
 - D. measures oil flow and steam flow
 - E. measures oil level and steam flow
- Answer: A*
32. One advantage of the electric probe type of low water fuel cut-off is:
- A. It contains no moving parts or the possibility of mechanical failure is eliminated,
 - B. They operate at a higher water level than the float type,
 - C. That the probes give an indication of the dissolved solids in the boiler water,
 - D. It gives a quicker response to the feedwater regulator,
 - E. Power is not required once boiler is in operation.
- Answer: A*
33. In some installations in order to guarantee a supply of clear hot water and prolong the life of a hot water heater the:
- A. Temperature differential of the temperature control is increased,
 - B. Temperature differential of the temperature control is decreased,
 - C. Operating temperature is raised,
 - D. Inner shell of the heater is lined with cement,
 - E. Only treated water is used.
- Answer: D*
34. In the vapour compression type of refrigeration system, the liquid refrigerant is changed to a gas in the:
- A. condenser
 - B. evaporator
 - C. receiver
 - D. compressor
 - E. refrigerant gas chamber
- Answer: B*
35. Safety valves on a refrigeration system:
- A. should be fitted on the receiver
 - B. should be tested by hand lever regularly
 - C. should be equipped with a leather seat
 - D. should discharge to sewer
 - E. should discharge into the receiver
- Answer: A*
36. The expansion valve in a refrigeration system is:
- A. between the condenser and the receiver
 - B. between the evaporator and the compressor
 - C. between the receiver and the evaporator
 - D. between the compressor and the condenser
 - E. between the compressor and the receiver
- Answer: C*

37. The three types of compressors most frequently used in refrigeration systems are:
1. Axial
 2. rotary
 3. centrifugal
 4. reciprocating
- A. 1, 2 and 3
B. 1, 3 and 4
C. 2, 3 and 4
D. 1, 2 and 4
E. All of the above

Answer: D

38. Which Canadian Code deals with refrigeration systems?
- A. CSA B51
B. CSA B52
C. CSA B31
D. CSA B16
E. CSA B35.1

Answer: B

39. Three common sensing elements used on humidistat are the:
1. Human hair element
 2. hygroscopic element
 3. Wood element
 4. Metal element.
- A. 1, 2 and 3
B. 1, 2 and 4
C. 1, 3 and 4
D. 2, 3 and 4
E. 2, 1 and 4

Answer: A

40. A Runaround air conditioning heat recovery system consists of two finned tube heat exchangers, the preconditioning coil and the recovery coil. Where is the preconditioning coil of this system usually located?
- A. on the suction side of the pump
B. on the discharge side of the 3-way mixing valve
C. in the duct work handling the ventilation into the process
D. at the end of the charging unit
E. in the ductwork handling exhaust air

Answer: C

41. The best type of filter for the removal of fine dust, smoke and fumes is the:
- A. viscous impingement filter
B. dry filter
C. bag type filter
D. electrostatic filter
E. micron filter

Answer: D

42. The purpose of boiling out a boiler is:
- A. to test the material of the boiler
B. to find the boiling point of the water in the boiler
C. to remove any grease and oil from the heating surface
D. to check if there are any leaks
E. to dry out the setting

Answer: C

43. The boiler boiling out procedure:
- A. should be done at operating pressure
 - B. should be done before the dry out procedure
 - C. should be done at one-half the operating pressure
 - D. should be done once a year
 - E. should be done once a week at start up

Answer: C

44. Prior to commencing boiler cleaning operations it is necessary to:
- 1. test the boiler water
 - 2. close steam and water valves
 - 3. tag all valves to indicate shut down
 - 4. complete the boiler-room log book
 - 5. check out the burners.

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

Answer: B

45. Natural ropes are made of:
- A. nylon
 - B. polyethylene
 - C. Dacron
 - D. manila
 - E. polypropylene

Answer: D

46. Raising or lowering of heavy objects using ropes and cables is known as:
- A. lifting
 - B. rigging
 - C. hoisting
 - D. craning
 - E. elevating

Answer: C

47. During an internal boiler inspection an engineer should check:
- A. that there is a proper air flow through the furnace.
 - B. that all external parts of drums and equipment are positioned properly.
 - C. for scale deposits, corrosion, erosion, cracks, leaks or other defects.
 - D. that the moveable grates and ash system are functioning properly.
 - E. All of the above.

Answer: C

48. The purpose of the absorber in a natural gas plant is to:
- A. remove condensates from the gas
 - B. absorb all the hydro-carbons from the gas
 - C. scrub the gas from amine
 - D. remove hydrogen sulphide and carbon dioxide from the gas
 - E. cool down the natural gas before the separator

Answer: D

49. The economizer in the steam cycle of an electricity generating plant is located between the:
- A. radiant and convection superheaters
 - B. boiler drum and superheater
 - C. feedwater pump and the boiler drum
 - D. superheater and the turbine.
 - E. dryers and digester

Answer: C

50. In a recovery boiler:
- A. waste heat is recovered from the baking operation
 - B. black liquor is burned to eliminate lignin
 - C. smelt is burnt to produce black liquor
 - D. lime is recovered for re-use
 - E. wood is recovered after the liquor is burned off

Answer: B