MECHANICAL ENGINEERING

Questions Shift-II (Memory Based)

1. Which of the following is a single stage impulse turbine?

Sol. De Laval turbine

2. What is the range of compression ratio of CI Engine?

Sol. 16-22

3. What are dilatant fluids?

Sol. Dilatant fluids, also known as shear thickening fluids, are liquids or solutions whose viscosity increases as stress is applied.

4. Which of the following is an example of thixotropic fluid?

Sol. Printer ink, Ice cream, honey, etc

5. Which of the following are examples of lower pairs?

Sol. Area or surface contact = lower pair

Eg:- Turning pair, sliding pair, spherical pair,

6. What is the unit of surface tension?

Sol. N/m

7. Which of the following is the correct statement regarding PMM1 ?

Sol. Producing continuous work without receiving energy from the source

8. The COP of the heat pump is_____ than the COP of the refrigerator.

Sol. Always greater

COP(Heat Pump) = 1 + COP (Refrigerator)

9. Heat and work are which type of function ?

A. point

B. path

C. both

Sol. Heat and Work are path functions

10. If the initial length is 200 mm and the final length is 220 mm. Percent elongation is ____.

Sol. 10%

$$\text{Percentage elongation} = \left(\frac{220-200}{200}\right)\times 100 = 10\%$$

11. If Indicated power is 15 kW, calorific value is 40000 kJ/kg and mass flow rate of fuel is 0.001 kg/sec. Indicated thermal efficiency is_____.

Sol. $$\eta_{indicated} = \frac{\text{Indicated power}}{m_f \times \text{Calorific Value}}$$

$$\eta_{indicated} = \frac{15\times 10^3}{0.001\times 40\times 10^6} = 0.375 = 37.5\%$$

12. What is the value of pressure above which a boiler is considered as a high pressure boiler ?

Sol. In a high pressure boiler, pressure is greater than 80 bar.

13. Which refrigerant is used in the air refrigeration cycle?

Sol. Air

14. Which type of refrigeration system is used in air crafts ?

Sol. Air refrigeration system is used as a refrigerant is aircrafts.

15. What is the working substance in the Rankine cycle?

Sol. Working fluid of the Rankine cycle is steam which is converted from water in the boiler.

16. In a carburizing flame in welding, which of the following is used in excess ?

A. Acetylene

B. Oxygen

C. Argon

D. Air

Sol. Acetylene is used in access in carburizing flame.

17. What is a pure substance?

Sol. Pure substance is one which has fixed or homogeneous chemical composition throughout. Example water, mixture of water and water vapour, gaseous air

18. Which of the following is not a type of steel?

A. austenite

B. limonite

C. pearlite

D. martensite

Ans. B

Sol. Limonite is not a type of steel.

19. Which of the following is the correct statement regarding the first law of thermodynamics?

Sol. According to First Law of Thermodynamics for a closed cyle net heat interaction is equal to net work interactions.

Or for a closed system in process, heat supplied to system-work done bty system is equal to change in internal energy

20. If the fuel ratio of a CI Engine is 17:1 to 18:1, then it is a _____.

A. lean mixture

B. Rich mixture

Sol. Air fuel ratio of CI is always a lean mixture.

21. What is the range of specific speed for Kaplan turbines?

Sol. Range of specific speed of Kaplan turbines is 300 to 600 rpm.

22. In which component of VCRS, Heat is released ?

A. Condenser

B. Compressor

C. Evaporator

Ans. A

Sol. Heat is released in a condenser in a VCRS refrigeration system.

23. What is the use of hydrogen in a three fluid refrigeration system ?

Sol to maintain low partial pressure of ammonia in evaporator

24. Bell coleman cycle is also known as

A. Reversed carnot cycle

B. Brayton cycle

C. stirling cycle

D. Reversed brayton cycle

Ans. D

Sol. Bell coleman cycle is also known as Reversed brayton cycle or Reversed Joule cycle

25. RTT Theorem uses which concept

A. Moving control Volume

B. Fixed control Volume

C. control surface analysis

Ans. B

Sol. In Reynold's Transport Theorem(RTT) fixed control volume approach is used.

26. When inclined tube manometer is used

Sol. inclined tube manometer are used to increase sensitivity of manometer to give more accurate reading of pressure

27. What kind of combustion takes place in Fourth stage of an CI engine

A. controlled

B. uncontrolled

C. after burning

D. Ignition lag

Ans. C

Sol. combustion in Fourth stage in diesel engine is after burning stage.

28. What is velocity head?

Sol. Difference between the energy gradient line and the hydraulic gradient line

29. Classification of steel is not done on the basis which parameter

A. Heat treatment

B. composition

C. Method of manufacturing

Ans. C

Sol. Classification of steel is not done on the basis of Method of manufacturing

30. What is a diffuser?

Sol. diverging passage and pressure rises at the expense of velocity

31. Refrigeration system which uses waste heat

A. Steam Jet refrigerator

B. Vortex refrigerator

C. VARS

Ans. C

Sol. Refrigeration system which uses waste heat is Vapour Absorption Refrigeration system

32. If the pressure of the fluid increased by reducing it to a smaller volume then the compressor is known as

Sol. if the pressure of the fluid increased by reducing it to smaller volume then the compressor is known as Positive displacement compressor

33. What is the work of a compressor ?

Sol. work of compressor is equal to energy supplied to fluid from rotor or impeller.

34. Rankine cycle efficiency can be increased by

A. By increasing condenser pressure

B. By increasing the mean temperature of heat addition

C. By increasing the condenser temperature

Ans. B

Sol. Rankine cycle efficiency can be increased by increasing the mean temperature of heat addition

35. Which is following is correct regarding static fluid -

Sol. Static fluid does not sustain any shear stress but it has only normal compressive stress or pressure.

36. Which of the following gives correct relation for hydrostatic pressure = ... x Depth of the point

A. Specific weight

B. Specific gravity

C. Density

D. Viscosity

Ans. A

Sol. hydrostatic pressure = specific gravity x Depth of the point

37. unit of dynamic Viscosity

Sol. Unit of dynamic viscosity is Centipoise

38. Which of the following is correct regarding hydrostatic pressure

A. force changes with direction

B. hydrostatic pressure directly proportional to depth of that point

C. it depends upon the density of the fluid

Ans. B

Sol. hydrostatic pressure is directly proportional to depth of that point

39. Spheroidal cast iron is also known as

A. Grey cast Iron

B. white cast Iron

C. MALLEABLE cast Iron

D. Ductile cast Iron

Ans. D

Sol. Spheroidal cast iron is also known as Ductile cast iron

40. Speed ratio of kaplan turbine

A. 0.8

B. 0.9

C. 2

D. 0.5

Ans. C

Sol. Speed ratio of kaplan turbine is 2.

41. Process in which ice directly converts into vapour

A. Vaporisation

B. Sublimation

C. Fusion

Ans. B

Sol. Process in which ice directly converts into vapour is sublimation

42. Fusible plug is used in which type of boiler

Sol. Fusible plug is used in Low capacity boilers / small fire tube boilers

GENERAL AWARENESS

1. Article 21 A is related to _____?

Sol. The Right of Children to Free and Compulsory Education Act or Right to Education Act (RTE) is an Act of the Parliament of India enacted on 4 August 2009, which describes the modalities of the importance of free and compulsory education for children between the age of 6 to 14 years in India under Article 21A of the Indian Constitution.

2. Who discovered the vaccine for small pox _____?

Sol. The smallpox vaccine, introduced by Edward Jenner in 1796, was the first successful vaccine to be developed.

3. Who is the Governor of Odisha _____?

Sol. Ganeshi Lal

4. Bangladesh does not share its border with which Indian state _____?

A. Tripura

B. West Bengal

C. Assam

D. Manipur

Ans. D

Sol. Five Indian states named Assam, West Bengal, Mizoram, Meghalaya, and Tripura shares borders with Bangladesh

4. Poshan Abhiyan was launched for _____?

Sol. POSHAN Abhiyaan is national nutrition mission to improve nutrition amongst children, pregnant women, and lactating mothers and it was launched on 8th March, 2018 from Jhunjhunu in Rajasthan.

5. AIDS is spread by _____?

Sol. HIV infection is caused by the human immunodeficiency virus. HIV is transmitted through bodily fluids that include:

(i). blood

(ii). semen

(iii). vaginal and rectal fluids

(iv). breast milk

6. When Abdur Rajjak arrived in Vijaynagar _____?

A. 8 AD

B. 11 AD

C. 13 AD

D. 17 AD

Ans. C

Sol. Abdur Razzak visited the city during the reign of Deva Raya II on January 13, A.D. 1442.

7. By which symbol, Molybdenum is indicated by _____?

A. Mo

B. Zn

C. W

D. Mn

Ans. A

Sol. Molybdenum is represented by MO.

8. 2012 olympic was held in which city

A. Athens

B. London

C. Beijing

Ans. B

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