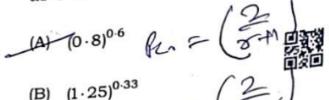


7. When a real gas undergoes 10. A device which is used to drain off water from steam pipes Joule-Thomson expansion, the without escape of steam is temperature called (A) always increases (A) steam trap (B) may increase or decrease (B) pressure reducing valve (C) always decreases (C) injector (D) may remain constant (D) steam separator Use of pulverized coal in boiler The amount of water evaporated furnace provides from and at 100 °C into dry saturated steam at atmospheric (A) better combustion pressure is called (B) less corrosion on furnace (A) equivalent evaporation walls (B) generation factor (C) high calorific value (C) boiler horsepower (D) smokeless burning (D) evaporative capacity Blowing down of boiler water is 12. A correctly designed convergentthe process to divergent nozzle working at designed load is steam (A) increase the temperature (A) always choked (B) control the solid concentra-(B) never choked tion in the boiler water (C) control the drum level (C) never isentropic (D) reduce the boiler pressure (D) always isentropic

13. What is the critical pressure ratio for isentropic nozzle flow with ratio of specific heats as 1.5?



- (C) $(1 \cdot 25)^3$
 - ~ (
- (D) $(0.8)^3$
- 14. Which of the following statements is/are true in relation to choked flow through a nozzle?

1. Discharge is maximum.

- Discharge is zero.
- 3. Velocity at throat is supersonic.
- 4. Nozzle exit pressure is less than or equal to critical pressure.

Select the correct answer using the codes given below.

- (A) Both 1 and 3
- (B) Both 2 and 3

(C) Both 1 and 4

(D) 1 only

- 15. Shock waves involving abrupt rise of pressure a increase of entropy general occur
 - (A) in the convergent section the nozzle
 - (B) at the nozzle throat

in the divergent section of the nozzle

- (D) at entry to the nozzle
- 16. Which of the following is a pressure compounded turbine?
 - (A) Parsons
 - (B) Curtis

(e) Rateau

- (D) All of the above
- In Parsons' reaction turbine, the velocity diagram triangles at the inlet and outlet are
 - (A) isosceles
 - (B) right angled

(c) congruent

(D) asymmetrical

- 18. The isentropic enthalpy drop in moving blade is two-third of the isentropic enthalpy in fixed blades of a turbine. The degree of reaction will be
 - (A) 0.6 $R = \frac{2}{3}f$ (B) 0.66
 - (C) 1.66

(D) 0:4

32/20

19. The breeder ratio for a breeder type reactor

(A) is unity

- (B) is more than unity
- (C) tends to infinity
- (D) is less than unity
- Identify the type of nuclear reactor that does not require a heat exchanger.
 - (A) Sodium-cooled
 - (B) Boiling water

, (C) Pressurized water

(D) Gas-cooled

- 21. For the same compression ratio and heat input, the cycle in decreasing order of thermal efficiency is
 - (A) Diesel, Otto, Dual
 - (B) Dual, Diesel, Otto
 - (C) Otto, Diesel, Dual
 - (D) Otto, Dual, Diesel
 - 22. Morse test is conducted only on
 - (A) low-power engines
 - (B) multi-cylinder engines
 - (C) water-cooled engines
 - (D) variable speed engines
 - 23. Which of the following identifies the anti-knock quality of diesel fuel?
 - (A) API gravity
 - (B) Octane number
 - (C) Cetane number
 - (D) SAE number

In a gas turbine cycle, the 27. 24. In a reciprocating compressor, turbine output is 600 kJ/kg one should aim at compressing compressor the the air 400 kJ/kg and the supplied is 1000 kJ/kg. thermal efficiency of the cycle is (A) isentropically (B) isothermally (C) polytropically (D) adiabatically (C) 80% 的 20% 25. The suction pressure is 1 bar and the delivery pressure is 125 bar. What is the ideal In a gas turbine cycle with 28. intermediate pressure at the regeneration end of first stage for a 3-stage air compressor? (A) work output decreases (B) thermal efficiency increases (B) 10 bar (C) heat input increases (C) 20 bar (D) pressure ratio increases (D) 25 bar 29. For a steady incompressible 26. Which one of the following types the u-component of velocity is given as $u = Ae^x$. The of impeller vanes is most corresponding v-component of commonly used in centrifugal type impellers? velocity is (A) $Ae^{x}u$ kward curved (C) Tangential (D) Forward curved 28/AE/CME/M-2022-7/16-D

30. In the boundary layer, the flow is	The movable wicket gates of a reaction turbine are used to
(A) inviscid and irrotational	(A) control the pressure under which the turbine is working
(B) inviscid and rotational	
(C) viscous and irrotational	(B) strengthen the casing of the turbine
(D) viscous and rotational	(C) reduce the size of the turbine
boundary layer control method to prevent separation?	(D) control the flow of water passing through the turbine
(A) Using large divergence angle in the boundary	
(B) Suction of accelerating fluid within the boundary	Consider the following energies associated with a Pelton turbine:
(C) Suction of retarded fluid within the boundary	1. Mechanical
(D) Use of smooth boundary	2. Kinetic
	8. Potential 32
32. Which one of the following dimensionless numbers identifies the compressibility effect of a fluid?	The correct sequence of energy conversion starting from the entry fluid is
(A) Froude number	(A) 2-3-1
(B) Mach number	(B) 3-2-1
(C) Weber number	(C) 1-3-2
(D) Euler number	(D) 1-2-3
28/AE/CME/M-2022-7/16-D 7	[P.T.O.
-do - Aer / da - Aer - Aer	+ f(4)

35. Kaplan turbine is

head axial turbine

- (B) an outward flow reaction turbine
- (C) an impulse inward flow turbine
- (D) a high head mixed flow turbine

The specific 37. speed centrifugal pump is given by

(A)
$$\frac{N\sqrt{P}}{H^{5/4}}$$

$$N\sqrt{Q}$$
 $H^{3/4}$

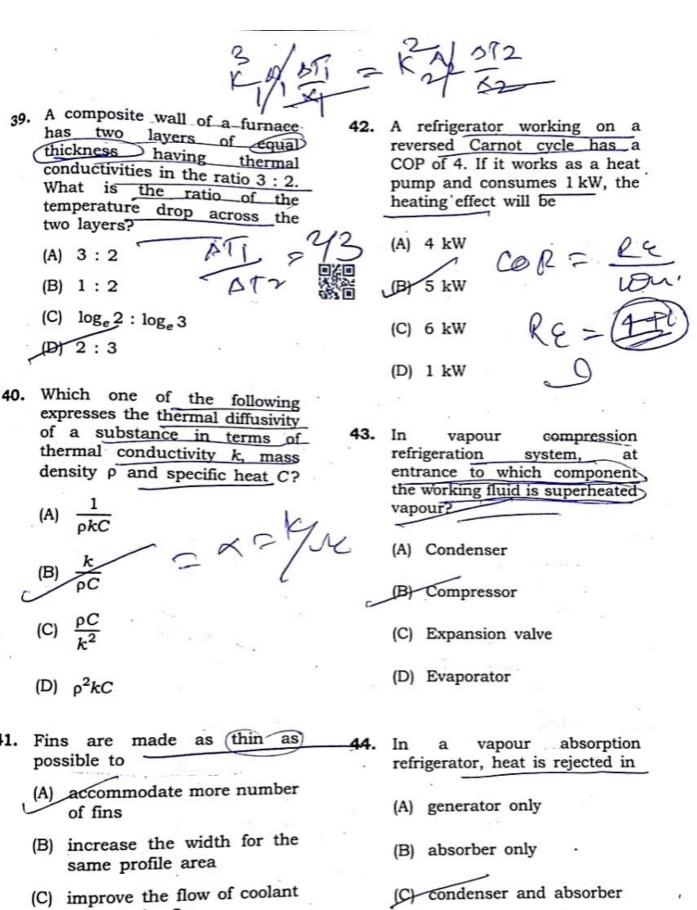
36. The specific speed N_s of a water furbine is expressed by which of the following expressions?

(A)
$$N_s = \frac{N\sqrt{P}}{H^{3/4}}$$

Fluid flow machines are using the principle of either (i) supplying energy to the fluid or (ii) extracting energy from the fluid. Some fluid flow machnies are combination of both (i) and (ii).

They are classified as

28/AE/CME/M-2022-7/16-D



(D) condenser only

around the fin

(D) reduce the total weight

two layers?

(A) 3:2

(B) 1:2

D 2:3

(D) $\rho^2 kC$

possible to

of fins

0	0	
(M)	4	100
	•	-

45.	What is an azeotrope?	48.	In
	(A) A refrigerant dissolved in alcohol	٠	rei
			(A)
	(B) A mixture of refrigerants		/D)

- (B) A mixture of refrigerants without phase separation
- (C) An eco-friendly refrigerant
- (D) A non-halogenic refrigerant

- 48. In aqua-ammonia and Li-E water absorption systems, to refrigerants are respectively
 - (A) water and Li-Br
 - (B) ammonia and Li-Br

(C) ammonia and water

(D) water and water

- 46. Global warming is caused by
 - (A) carbon dioxide
 - (B) nitrogen
 - (C) carbon monoxide
 - (D) ozone

- 49. Which one of the following is the extensive property of a thermodynamic system?
 - (A) Pressure
 - (B) Temperature
 - (C) Density
 - (D) Volume
- 47. The most common type of absorption system in use in industrial applications is based on the refrigerant absorbent combination of
 - (A) lithium bromide-air
 - (B) carbon dioxide-water
 - (C) ammonia-water
 - (D) air-water

- 50. Zeroth law of thermodynamics forms the basis of measurement.
 - (A) temperature
 - (B) heat exchange
 - (C) work
 - (D) pressure