Question: The kinematic viscosity of a liquid is 6 stokes. What will the kinematic viscosity in m^2/s?

(a) $6 \times 10^{-2} \ m^2/s$

(b) $6 \times 10^{-4} m^2/s$

(c) $6 \times 10^{-3} m^2/s$

(d) $6 \times 10^2 \ m^2/s$

Answer: b

Question: Which of the following is defined as the gas constant of a gas?

(a) The reciprocal of the ratio of the universal gas constant to the molecular weight of the gas.

(b) The product of the universal gas constant and the molecular weight of the gas.

(c) The reciprocal of the product of the universal gas constant and the molecular weight of the gas

(d) The ratio of the universal gas constant to the molecular weight of the gas.

Answer: d

Question: The discharge (Q) through an orifice meter is given by:
(Where a_1 and a_2 are the area of the pipe and orifice, C_d is the coefficient of discharge and h is the difference of pressure head in the orifice meter)

(a) $Q = C_d \dfrac{a_1 - a_2}{\sqrt{a_1^2 - a_2^2}} \sqrt{2gh}$

(b) $Q = C_d \dfrac{a_1/a_2}{\sqrt{a_1^2 - a_2^2}} \sqrt{2gh}$

(c) $Q = C_d \dfrac{a_1 + a_2}{\sqrt{a_1^2 - a_2^2}} \sqrt{2gh}$

(d) $Q = C_d \dfrac{a_1 a_2}{\sqrt{a_1^2 - a_2^2}} \sqrt{2gh}$

Answer: d

Question: The Reynold number for laminar flow should be:

(a) greater than 6000

(b) lesser than 2000

(c) greater than 4000

(d) lesser than 1000

Answer: b

Question: An isenthalpic process is a process during which _____ remains constant.

(a) temperature

(b) entropy

(c) enthalpy

(d) pressure

Answer: c

Question: Which of the following temperature measuring devices is suitable for measuring temperatures ranging from 900℃ to 4000℃?

(a) Bimetallic thermometer

(b) Thermocouple thermometer

(c) Optical Pyrometer

(d) Resistance thermometer

Answer: c

Question: Which of the following is NOT common for petrol and diesel engines?

(a) Spark plugs

(b) Flywheel

(c) Gudgeon pin

(d) Piston rings

Answer: a

Question: Which of the following is NOT a characteristics of entropy?

(a) It remains unchanged in all adiabatic frictionless processes

(b) It changes in all adiabatic frictionless processes

(c) It increases when heat is supplied irrespective of whether temperature changes or not .

(d) It decreases when heat is removed irrespective of whether temperature changes or not.

Answer: b

Question: Poisson's ratio (ν) is given by:

(a) Shear strain/Axial strain

(b) Axial strain/ Shear strain

(c) Transverse strain/Axial strain

(d) Axial strain/Transverse strain

Answer: c

Question: In case of a reciprocating compressor, the clearance ratio is:

(a) Swept volume of cylinder / Total volume of cylinder

(b) Swept volume of cylinder/ Clearance volume

(c) Clearance Volume/Swept Volume of cylinder

(d) Clearance volume/Total volume of cylinder

Answer: c

Question: The Triple point of H_2O is at:

(a) 216.16 K

(b) 13.96 K

(c) 273.16 K

(d) 24.96 K

Answer: c

Question: A heat engine receives heat at the rate of 25 kJ/s and gives an output of 8.2 kW. What will be the thermal efficiency of the heat engine?

(a) 67.2%

(b) 20.4%

(c) 30.4%

(d) 32.8%

Answer: d

Question: A refrigerating system operates on reversed Carnot cycle. The higher temperature of the refrigerant in the system is 35°C and the lower temperature is -15°C. The COP of the system will be '

(a) 0.19

(b) 5.16

(c) 1.93

(d) 0.51

Answer: b

Question: The ratio of specific heats $\gamma = C_P/C_V$ is always greater than unity, because _____

(a) $C_P = C_V + R$

(b) $C_V = C_P + C_P.R$

(c) $C_V = C_P + R$

(d) $C_P = C_V - R$

Answer: a

Question: The number of teeth on two meshing gears is 40. The teeth have $20°$ involute profile and the module is 6 mm. What will be the circular pitch?

(a) 18.85 mm

(b) 12.00 mm

(c) 33.33 mm

(d) 66.66 m

Answer: a

Question: What happens on bleeding steam to reheat feed water to boiler?

(a) It does not affect the thermal efficiency of the cycle

(b) It drops the thermal efficiency of the cycle

(c) It improves the thermal efficiency of the cycle

Answer: c

(d) It may improve or drop the thermal efficiency of the cycle based on point of extraction of steam.

Question: Which of the following is an accessory of boiler ?

(a) Feed pump

(b) Blow-off cock

(c) Fusible plug

(d) Feed check valve

Answer: a

Question: The maximum bending moment in a simply supported beam of length (l) carrying a point load (W) at mid span is given by:

(a) $\frac{Wl}{8}$

(b) $\frac{Wl}{12}$

(c) $\frac{Wl}{2}$

(d) $\frac{Wl}{4}$

Answer: d

Question: The functional relation of enthalpy (h) with internal energy (u) and pressure volume product (pv) is given by:

(a) u = h + pv

(b) h = u – pv

(c) u = pv – h

(d) h = u + pv

Answer: d

Question: In 1 kg of wet steam, dry steam is 0.9 kg and water particle is 0.1 kg. What is the dryness fraction?

(a) 0.9

(b) 1

(c) 9

(d) 0.1

Answer: a

Question: _____ enhances the directional solidification of complex casting geometries

(a) Runner extension

(b) Bottom gate

(c) Step gate

(d) Chill

Answer: d

Question: The variation of shear stress developed in a circular shaft subjected to torsion is:

(a) hyperbolic

(b) linear

(c) parabolic

(d) uniform

Answer: b

Question: Which of the following cycle is also known as constant pressure cycle?

(a) Carnot cycle

(b) Dual cycle

(c) Otto cycle

(d) Diesel cycle

Answer: d

Question: Which of the following statements is a corollary of Carnot's theorem?

(a) The efficiency of all reversible heat engines operating between the same temperature levels is the same

(b) The efficiency of all reversible heat engine between the same temperature level is different

(c) The efficiency of all irreversible heat engines operating between the same temperature level is the same

(d) The efficiency of all irreversible heat engines operating between the same temperature level is different.

Answer: a

Question: A perfect vacuum is obtained when:

(a) absolute pressure is zero

(b) atmospheric pressure is zero

(c) gauge pressure is positive

(d) gauge pressure is zero

Answer: a

Question: A mechanism has l number of links and j number of binary joints. The degree of freedom (n) of mechanism according to Grubbler's criterion will be given by:

(a) $n = 2(l - 1) - 2j$

(b) $n = 2(l - 1) - 3j$

(c) $n = 3(l - 1) - 2j$

(d) $n = 3(l - 1) - 3j$

Answer: c

Question: Which of the following is the correct equation for gauge pressure at a point?

(a) $P_{gauge} = P_{absolute} - P_{atmopshere}$

(b) $P_{gauge} = P_{vacuum} + P_{absolute}$

(c) $P_{gauge} = P_{absolute} + P_{atmosphere}$

(d) $P_{gauge} = P_{vacuum} + P_{atmosphere}$

Answer: a

Question: The third law of thermodynamics

(a) introduces the principle of increase of entropy

(b) throws light on concepts of internal energy

(c) establishes a concept of temperature

(d) defines the absolute zero of entropy

Answer: d

Question: Hook's law is obeyed up to the _____

(a) Elastic limit

(b) upper yield point

(c) proportionality limit

(d) breaking point

Answer: c

Question: If T_1 = Tight side tension, T_2 = slack side tension and v = linear velocity of belt, then the power transmitted by belt drive is given by:

(a) $P = (T_1 + T_2)v$

(b) $P = (T_1 \times T_2)v$

(c) $P = (T_1 \pm T_2)v$

(d) $P = (T_1 - T_2)v$

Answer: d

Question: If r and γ are compression ratio and ratio of specific heats respectively, then the air standard efficiency of the Otto cycle is given by:

(a) $\eta_{otto} = 1 - \dfrac{1}{r^\gamma}$

(b) $\eta_{otto} = 1 - \dfrac{1}{r^{\gamma-1}}$

(c) $\eta_{otto} = 1 - \dfrac{1}{r^{\gamma-1}-1}$

(d) $\eta_{otto} = 1 - \frac{1}{r^{\gamma-1}}$

Answer: d

Question: A cast-iron pipe of 750 mm diameter is used to carry water under pressure of 0.5886 MP(a) What should be the thickness of the pipe if the permissible stress is 20 MPa?

(a) 1.104 mm

(b) 11.04 mm

(c) 1104 mm

(d) 110.4 mm

Answer: b

Question: Rankine's formula is valid for _____

(a) long columns

(b) short columns

(c) short columns as well as long columns

(d) moderate columns

Answer: c

Question: The flywheel of a steam engine has a radius of gyration of 1 m and mass 2400 kg. The starting torque of the steam engine is 1500 N-m. What will be the angular acceleration of the flywheel?

(a) 1.60 rad/s^2

(b) 0.625 rad/s^2

(c) 6.25 rad/s^2

(d) 16.0 rad/s^2

Answer: b

Question: The mean specific heat (C_{ps}) for superheated steam at 0.5 bar, between 300°C and 400°C, is: (Consider h_{sup} = 3075.5 kJ/kg at 300°C and h_{sup} = 3278.9 kJ/kg at 400°C)

(a) $C_{ps} = 1.49$

(b) $C_{ps} = 0.03$

(c) $C_{ps} = 2.03$

(d) $C_{ps} = 0.49$

Answer: c

Question: The degree of reaction for Parson's reaction turbine is :

(a) 70%

(b) 90%

(c) 50%

(d) 30%

Answer: c

Question: Cold working of metal forming processes is carried out _____

(a) below the recrystallising temperature

(b) above the recrystallising temperature

(c) above the melting point

(d) below the melting point

Answer: a

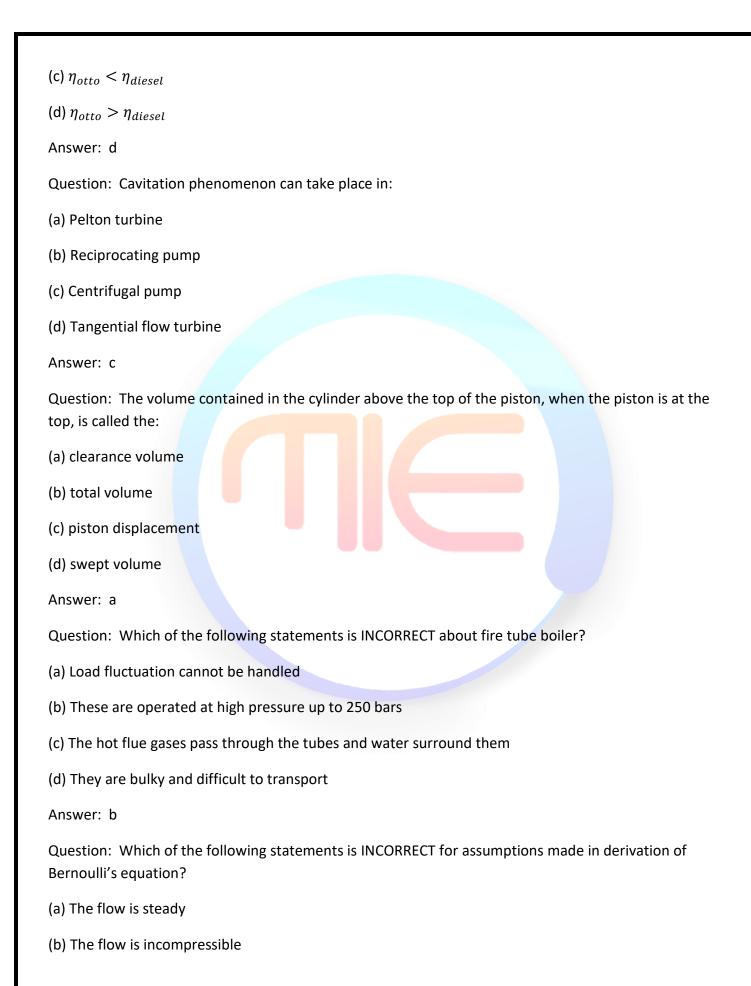Question: As per Newton's law of viscosity , shear stress is directly proportional to _____

(a) velocity

(b) viscosity

(c) velocity gradient

(d) shear strain

Answer: c

Question: If the compression ratio is kept the same for Otto cycle and diesel cycle, then which of the following equations is correct?

(a) $\eta_{otto} \leq \eta_{diesel}$

(b) $\eta_{otto} = \eta_{diesel}$

(c) $\eta_{otto} < \eta_{diesel}$

(d) $\eta_{otto} > \eta_{diesel}$

Answer: d

Question: Cavitation phenomenon can take place in:

(a) Pelton turbine

(b) Reciprocating pump

(c) Centrifugal pump

(d) Tangential flow turbine

Answer: c

Question: The volume contained in the cylinder above the top of the piston, when the piston is at the top, is called the:

(a) clearance volume

(b) total volume

(c) piston displacement

(d) swept volume

Answer: a

Question: Which of the following statements is INCORRECT about fire tube boiler?

(a) Load fluctuation cannot be handled

(b) These are operated at high pressure up to 250 bars

(c) The hot flue gases pass through the tubes and water surround them

(d) They are bulky and difficult to transport

Answer: b

Question: Which of the following statements is INCORRECT for assumptions made in derivation of Bernoulli's equation?

(a) The flow is steady

(b) The flow is incompressible

(c) The viscosity of fluid is non-zero

(d) The flow is irrotational

Answer: c

Question: If water is heated at 0°C, the specific volume:

(a) first decrease and then increases

(b) first increases and then decreases

(c) decreases gradually

(d) remain same

Answer: a

Question: If water is flowing through a pipe of 5 cm diameter under a pressure of 20 N/cm^2 and a mean velocity of 2.0 m/s, the kinetic head will be :

(a) 20.4 m

(b) 0.101 m

(c) 0.204 m

(d) 10.1 m

Answer: c

Question: A 1.01325 bar pressure is equivalent to :

(a) 0.760 cm of Hg

(b) 7.60 cm of Hg

(c) 76.0 cm of Hg

(d) 760 cm of Hg

Answer: c

Question: Continuity equation for compressible fluids is given by:

(a) $A_1 V_1 = A_2 V_2$

(b) $\rho_1 A_1 V_1 = \rho_2 A_2 V_2$

(c) $\rho_1 V_1 = \rho_2 V_2$

(d) $\rho_1 A_1 V_1 = \rho_1 A_2 V_1$

Answer: b

Question: The relation between surface tension (σ) and the difference of pressure (p) between the inside and outside of a liquid drop of diameter (d) is given by:

(a) $p = 6\sigma/d$

(b) $p = 4\sigma/d$

(c) $p = 2\sigma/d$

(d) $p = 8\sigma/d$

Answer: b

Question: The number of instantaneous centres in a slider crank mechanism is :

(a) 8

(b) 4

(c) 6

(d) 12

Answer: c