

SJVNL ET

**Previous Year Paper
Mechanical
28 May, 2019 Shift 1**





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Participant ID	
Participant Name	
Test Center Name	iON Digital Zone Ganga Nagar Meerut
Test Date	28/05/2019
Test Time	9:00 AM - 11:30 AM
Subject	Executive Trainee Mechanical

Section : Discipline

Q.1 A cantilever beam of length L carry a UDL of W per length across the whole span. What will be the value of maximum shear stress and maximum bending moment on the beam respectively?

- Ans
- ☒ 1. $\frac{WL}{2}, WL^2$
 - ☒ 2. WL, WL^2
 - ☒ 3. $\frac{WL}{2}, \frac{WL^2}{2}$
 - ☒ 4. $WL, \frac{WL^2}{2}$

Question ID : 16794327834
Status : Answered
Chosen Option : 4

Q.2 Dry saturated steam enters a frictionless adiabatic nozzle with negligible velocity at a temperature of 300°C [$h_1 = 2751$ kJ/kg]. It is expanded to a pressure of 5 MPa isentropically [$h_2 = 2651$ kJ/kg]. What will be the exit velocity of steam?

- Ans
- ☒ 1. 447.21 m/s
 - ☒ 2. 572.33 m/s
 - ☒ 3. 14.14 m/s
 - ☒ 4. 150.32 m/s

Question ID : 16794327818
Status : Answered
Chosen Option : 1

Q.3 _____ is a boiler mounting.

- Ans
- ☒ 1. Air preheater
 - ☒ 2. Fusible plug
 - ☒ 3. Economizer
 - ☒ 4. Super heater

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Question ID : 16794327817
Status : Answered
Chosen Option : 2

Q.4 Dimension of surface tension is:

- Ans
- ☒ 1. ML^2T^{-2}
 - ☒ 2. MT^{-2}
 - ☒ 3. $ML^{-1}T^{-2}$
 - ☒ 4. MT^{-1}

Question ID : 16794327803
Status : Answered
Chosen Option : 2

Q.5 Which of the following represents the slope of constant pressure line on T-s diagram of an ideal gas? [where, C_p and C_v are specific heat of gas]

- Ans
- ☒ 1. $\frac{T}{C_p}$
 - ☒ 2. $\frac{T}{C_p^2}$
 - ☒ 3. $\frac{T}{C_v}$
 - ☒ 4. $\frac{T^2}{C_p}$

Question ID : 16794327769
Status : Answered
Chosen Option : 1

Q.6 An ideal gas having the weight of 20 N/m^3 at the temperature of 27°C and pressure of 0.26 N/mm^2 (abs). The gas constant will be [Consider $g = 9.81 \text{ m/s}^2$]

- Ans
- ☒ 1. 912 kJ/kg-K
 - ☒ 2. 0.912 kJ/kg-K
 - ☒ 3. 0.4251 kJ/kg-K
 - ☒ 4. 425.1 kJ/kg-K

Question ID : 16794327795
Status : Answered
Chosen Option : 3

Q.7 Bourdon tube is used to measure:

- Ans
- ☒ 1. Volume flow rate
 - ☒ 2. Temperature of gas

✗ 3. Velocity of flow

✓ 4. Pressure

Question ID : 16794327857

Status : Answered

Chosen Option : 4

Q.8 A heat engine receives heat from a source at 1200 K at the rate of 500 kW and rejects the waste heat to a medium at 300 K. The power output of the heat engine is 180 kW. What will be the irreversibility of the system?

Ans ✓ 1. 195 kW

✗ 2. 340 kW

✗ 3. 125 kW

✗ 4. 320 kW

Question ID : 16794327772

Status : Answered

Chosen Option : 3

Q.9 Which of the following is not the Maxwell's equation?

Ans ✗ 1. $\left(\frac{\partial S}{\partial V}\right)_T = \left(\frac{\partial P}{\partial T}\right)_V$

✓ 2. $\left(\frac{\partial V}{\partial T}\right)_P = -\left(\frac{\partial P}{\partial S}\right)_T$

✗ 3. $\left(\frac{\partial T}{\partial P}\right)_S = \left(\frac{\partial V}{\partial S}\right)_P$

✗ 4. $\left(\frac{\partial T}{\partial V}\right)_S = -\left(\frac{\partial P}{\partial S}\right)_V$

Question ID : 16794327773

Status : Answered

Chosen Option : 2

Q.1 Joule-Kelvin coefficient is given by [where T = absolute temperature, P = Pressure, s = Specific entropy, h = Specific enthalpy]

Ans ✗ 1. $\left(\frac{\partial T}{\partial s}\right)_h$

✗ 2. $\left(\frac{\partial s}{\partial T}\right)_h$

✓ 3. $\left(\frac{\partial T}{\partial P}\right)_h$

✗ 4. $\left(\frac{\partial T}{\partial s}\right)$

Question ID : 16794327781

Status : Answered

Chosen Option : 3

Q.1 A single-stage, single acting reciprocating refrigerant compressor has the following data:

1

Clearance volume = 0.0005 m^3

Stroke volume = 0.01 m^3

Suction volume = 0.0084 m^3

The volumetric efficiency of compressor is given by

Ans ☒ 1. 84%

☒ 2. 94%

☒ 3. 78%

☒ 4. 90%

Question ID : 16794327794

Status : Answered

Chosen Option : 1

Q.1 The safeguarding structure provided in the dam to relieve the reservoir of excess water when the water level in the

2

reservoir rises, is known as:

Ans ☒ 1. Spillways

☒ 2. Draft tube

☒ 3. Catchment area

☒ 4. Surge tank

Question ID : 16794327852

Status : Answered

Chosen Option : 4

Q.1 Which of the following is not the secondary processes of powder metallurgy?

3

Ans ☒ 1. Heat treatment

☒ 2. Impregnation

☒ 3. infiltration

☒ 4. Sintering

Question ID : 16794327864

Status : Answered

Chosen Option : 1

Q.1 In an assembly line, five workers are assigned a work which take 80,60,70,70,70 seconds respectively. The balance

4

delay for line is:

Ans ☒ 1. 14%

☒ 2. 12.5%

☒ 3. 16%

☒ 4. 10%

Question ID : 16794327880

Status : Answered

Chosen Option : 2

Q.1
5 Which of the following function is valid potential function (ϕ)?

- Ans
- ☒ 1. $x^2 - 3x^2y$
 - ☒ 2. $y^4 - 6x^2y^2$
 - ☒ 3. $y^3 - 3x^2y$
 - ☒ 4. $x^3 - y^3$

Question ID : 16794327801
Status : Answered
Chosen Option : 3

Q.1
6 Data of an orthogonal cutting is:

Chip thickness ratio = 0.4

Rake angle = 20° ,

What will be the shear plane angle?

[given, $\cos 20^\circ = 0.94$, $\sin 20^\circ = 0.34$]

- Ans
- ☒ 1. $\cos^{-1}(0.711)$
 - ☒ 2. $\tan^{-1}(0.435)$
 - ☒ 3. $\tan^{-1}(0.711)$
 - ☒ 4. $\tan^{-1}(0.211)$

Question ID : 16794327869
Status : Answered
Chosen Option : 2

Q.1
7 A prismatic bar with rectangular cross-section of $20 \text{ mm} \times 40 \text{ mm}$ and length of 2.8 m is subjected to an axial tensile force of 70 kN . The elongation of bar is 1.2 mm . What is the tensile stress and strain of the bar respectively?

- Ans
- ☒ 1. 8.75 MPa , 0.000428
 - ☒ 2. 87.5 MPa , 0.000428
 - ☒ 3. 8.75 MPa , 0.00428
 - ☒ 4. 87.5 MPa , 0.00428

Question ID : 16794327828
Status : Answered
Chosen Option : 2

Q.1
8 A body weighs 20 N and 10 N when submerged in the liquids of specific gravity 0.8 and 1.2 respectively. The volume of the body will be given by

- Ans
- ☒ 1. $2.548 \times 10^{-3} \text{ m}^3$
 - ☒ 2. $2.935 \times 10^{-3} \text{ m}^3$

✗ 3. $3.215 \times 10^{-3} \text{ m}^3$

✗ 4. $2.875 \times 10^{-3} \text{ m}^3$

Question ID : 16794327798

Status : Answered

Chosen Option : 1

Q.1 The compression ratio corresponds to the maximum network output per unit mass in the Otto cycle between upper and lower limits of absolute temperature T_3 and T_1 respectively, is given by: [where γ = Ratio of specific heats]

Ans

✗ 1. $\left(\frac{T_3}{T_1}\right)^{2(\gamma-1)}$

✗ 2. $\frac{T_3}{T_1}$

✓ 3. $\left(\frac{T_3}{T_1}\right)^{\frac{1}{2(\gamma-1)}}$

✗ 4. $\left(\frac{T_3}{T_1}\right)^{\frac{1}{\gamma-1}}$

Question ID : 16794327774

Status : Answered

Chosen Option : 3

Q.2 The compressor of turbocharger is driven

Ans

✗ 1. by mechanical power of engine

✗ 2. Manually

✓ 3. by gas turbine mounted in the exhaust flow of engine

✗ 4. by separate electrical motor driven by battery

Question ID : 16794327776

Status : Answered

Chosen Option : 3

Q.2 Pelton turbine is an example of:

Ans

✓ 1. Tangential flow turbine

✗ 2. Axial flow turbine

✗ 3. High specific speed turbine

✗ 4. Low head turbine

Question ID : 16794327813

Status : Answered

Chosen Option : 1

Q.2

2 Which of the following relation is correct for Earnst-Merchant Theory? [where ϕ = Shear angle, α = Rake angle, β = Friction angle]

- Ans
- ☒ 1. $\phi = \frac{\pi}{2} - \frac{1}{2}(\alpha - \beta)$
 - ☒ 2. $\phi = \frac{\pi}{4} + \frac{1}{2}(\alpha - \beta)$
 - ☒ 3. $\phi = \frac{\pi}{2} + \frac{1}{2}(\alpha - \beta)$
 - ☒ 4. $\phi = \frac{\pi}{4} - \frac{1}{2}(\alpha - \beta)$

Question ID : 16794327871
Status : Answered
Chosen Option : 4

Q.2 In metallurgical and materials engineering systems, the Gibbs Phase Rule is given by: [pressure is maintained at one atmosphere]
3 [where F = Number of degrees of freedom, C = Number of components, P = Number of phases which can coexist at equilibrium]

- Ans
- ☒ 1. $F = C + 1 - P$
 - ☒ 2. $F = C + 1 + P$
 - ☒ 3. $F = C - 1 + P$
 - ☒ 4. $F = C - 1 - P$

Question ID : 16794327861
Status : Answered
Chosen Option : 1

Q.2 Which of the following is an open conduit?
4

- Ans
- ☒ 1. Tunnel
 - ☒ 2. Flume
 - ☒ 3. Penstock
 - ☒ 4. Pipeline

Question ID : 16794327853
Status : Answered
Chosen Option : 2

Q.2 On Mollier chart, slope of an isobar on h-s diagram is equal to: [where T = absolute temperature]
5

- Ans
- ☒ 1. T^4
 - ☒ 2. T^2
 - ☒ 3. T
 - ☒ 4. T^3

Question ID : 16794327780
Status : Answered
Chosen Option : 3

Q.2 Which of the following sets of equations represents the possible 2-D, incompressible flow?

6

- Ans
- ☒ 1. $u = 4x + y, v = x - y^2$
 - ☒ 2. $u = x + 2y, v = x^2 - y^2$
 - ☒ 3. $u = x + y, v = x - y$
 - ☒ 4. $u = xt + 2y, v = x^2 - yt^2$

Question ID : 16794327799

Status : Answered

Chosen Option : 3

Q.2 Face of a tooth in spur gear is:

7

- Ans
- ☒ 1. The surface between pitch circle and top land
 - ☒ 2. The surface between top land and bottom land
 - ☒ 3. The surface between pitch circle and bottom land
 - ☒ 4. The surface of the top of the tooth

Question ID : 16794327844

Status : Answered

Chosen Option : 1

Q.2 A zone of cupola furnace which starts from above the melting zone and extends upto bottom of charging door is known as:

8

- Ans
- ☒ 1. Stack zone
 - ☒ 2. Well
 - ☒ 3. Preheating zone
 - ☒ 4. Combustion zone

Question ID : 16794327865

Status : Answered

Chosen Option : 4

Q.2 Which of the following is the best suitable range of working head of Kaplan turbine?

9

- Ans
- ☒ 1. 5 - 70 m
 - ☒ 2. 500 - 2000 m
 - ☒ 3. 300 - 1500 m
 - ☒ 4. 100 - 300 m

Question ID : 16794327812

Status : Answered

Chosen Option : 1

Q.3 The expected time of a PERT activity is given by: [where t_1 = Optimistic time, t_2 = Most likely time, t_3 = Pessimistic time]

0

Ans

✓ 1. $\frac{t_1 + 4t_2 + t_3}{6}$

✗ 2. $\frac{4t_1 + t_2 + t_3}{6}$

✗ 3. $\frac{t_1 + 4t_2 + t_3}{4}$

✗ 4. $\frac{t_1 + 4t_3 + t_2}{6}$

Question ID : 16794327882

Status : Answered

Chosen Option : 1

Q.3 In a flow, velocity vector is given by $v = -y^2\hat{i} - 6x\hat{j}$. The equation of streamline passing through the point (1,1) will be:

Ans ✗ 1. $9x^3 - y^3 = 8$

✗ 2. $9x - y = 8$

✓ 3. $9x^2 - y^3 = 8$

✗ 4. $9x^2 - y^2 = 8$

Question ID : 16794327800

Status : Answered

Chosen Option : 3

Q.3 Water is flowing through a pipe of diameter 15 cm. At a section, the gauge pressure is 40 kPa and mean velocity is found to be 2 m/s. If the centerline of the pipe is 10 m above the datum, the total head in the flow will be given by [Kinetic energy correction factor = 1.2, $g = 10 \text{ m/s}^2$]

Ans ✗ 1. 12.80 m

✓ 2. 14.24 m

✗ 3. 11.80 m

✗ 4. 13.20 m

Question ID : 16794327802

Status : Answered

Chosen Option : 2

Q.3 The symbol ∇ refers to:

Ans ✓ 1. Single Fillet weld

✗ 2. Square butt weld

✗ 3. Seam weld

✗ 4. Single V-butt weld

Question ID : 16794327841

Status : Answered

Chosen Option : 1

Q.3 A steam turbine receives steam at 15 bar, 350°C [$h = 3147.5$ kJ/kg, $s = 7.100$ kJ/kg-K] and exhaust to the condenser at 0.06 bar. [$h_f = 151.5$ kJ/kg, $h_{fg} = 2416.0$ kJ/kg, $s_f = 0.520$ kJ/kg-K, $s_{fg} = 7.800$ kJ/kg-K] What will be the approximate thermal efficiency of ideal Rankine cycle operating between these two limits? [Neglect the pump work]

- Ans
- ☒ 1. 49.79%
 - ☒ 2. 45.76%
 - ☒ 3. 22.76%
 - ☒ 4. 31.97%

Question ID : 16794327854
Status : Answered
Chosen Option : 4

Q.3 The symbol \Rightarrow in the method study chart refers to:

- Ans
- ☒ 1. Transport
 - ☒ 2. Storage
 - ☒ 3. Operation
 - ☒ 4. Inspection

Question ID : 16794327885
Status : Answered
Chosen Option : 1

Q.3 A rectangular plane surface of width 2 m and height 3 m is placed vertically in water. What will be the location of center of pressure of the surface when its upper edge is horizontal and lies 2.5 m below the free surface of water?

- Ans
- ☒ 1. 4.0755 m
 - ☒ 2. 4.0125 m
 - ☒ 3. 4.2525 m
 - ☒ 4. 4.1875 m

Question ID : 16794327797
Status : Answered
Chosen Option : 4

Q.3 Which of the following is not the characteristics of cutting tool material?

- Ans
- ☒ 1. It should have high toughness
 - ☒ 2. It should have high resistance to softening at higher temperature
 - ☒ 3. It should have higher hardness than that of the work material
 - ☒ 4. Coefficient of friction between chip and tool should be very high

Question ID : 16794327870
Status : Answered
Chosen Option : 4

Q.3 In a single-stage impulse turbine, which of the following is correct? [where, η_s = Stage efficiency, η_b = Blade efficiency, η_N = Nozzle efficiency]

- Ans
- ✓ 1. $\eta_s = \eta_b \times \eta_N$
 - ✗ 2. $\eta_s = \eta_b / \eta_N$
 - ✗ 3. $\eta_s = \eta_N / \eta_b$
 - ✗ 4. $\eta_s = \eta_N + \eta_b$

Question ID : 16794327819
Status : Answered
Chosen Option : 1

Q.3 A simply supported beam of length L loaded by a UDL of W per length all along the whole span. The value of slope at the support will be [E = modulus of elasticity, I = moment of inertia of section of beam]

- Ans
- ✓ 1. $\frac{WL^3}{24EI}$
 - ✗ 2. $\frac{WL^4}{48EI}$
 - ✗ 3. $\frac{WL^3}{48EI}$
 - ✗ 4. $\frac{WL^4}{24EI}$

Question ID : 16794327837
Status : Answered
Chosen Option : 1

Q.4 What will be the momentum thickness for the velocity distribution in boundary layer of:

0 $\frac{u}{U} = \frac{y}{\delta}$, where u = Velocity at a distance y from the plate and $u = U$ at $y = \delta$ (Boundary layer thickness)

- Ans
- ✗ 1. $\frac{\delta}{5}$
 - ✗ 2. $\frac{\delta}{3}$
 - ✓ 3. $\frac{\delta}{6}$
 - ✗ 4. $\frac{\delta}{2}$

Question ID : 16794327805
Status : Answered
Chosen Option : 3

Q.4 The intensity of solar radiation is maximum at a wavelength of $0.49 \mu\text{m}$. Assuming the Sun as a black body, what is the approximate total emissive power of Sun? [Consider Wien's displacement constant = $2890 \mu\text{m-K}$]

- Ans
- ✓ 1. $6.86 \times 10^4 \text{ kW/m}^2$
 - ✗ 2. $6.86 \times 10^7 \text{ kW/m}^2$

- ☒ 3. 6.86 W/m^2
- ☒ 4. 6.86 kW/m^2

Question ID : 16794327788
Status : Answered
Chosen Option : 1

Q.4
2 Abrasive grain size of 10 on grinding wheel refers to:

- Ans ☒ 1. Fine grain wheel
- ☒ 2. Coarse grain wheel
- ☒ 3. Medium grain wheel
- ☒ 4. Very fine grain wheel

Question ID : 16794327873
Status : Answered
Chosen Option : 2

Q.4
3 The relative thickness of hydrodynamic and thermal boundary layer depends upon:

- Ans ☒ 1. Mach Number
- ☒ 2. Nusselt Number
- ☒ 3. Reynolds Number
- ☒ 4. Prandtl Number

Question ID : 16794327786
Status : Answered
Chosen Option : 4

Q.4
4 Which of the following is the correct relation for gear?

- Ans ☒ 1. Circular pitch = $\pi \times \text{Module}$
- ☒ 2. Circular pitch = $2 \times \text{Module}$
- ☒ 3. Circular pitch = $2\pi \times \text{Module}$
- ☒ 4. Circular pitch = Module

Question ID : 16794327843
Status : Answered
Chosen Option : 1

Q.4
5 Which of the following is correct for MRR variation in EDM process using RC relaxation circuit?

- Ans ☒ 1. MRR decreases with increase in capacitance of circuit
- ☒ 2. MRR decreases with increase in resistance of circuit
- ☒ 3. MRR decreases with increase in mean current in circuit
- ☒ 4. MRR remain constant with increase in resistance of circuit

Question ID : 16794327874
Status : Answered
Chosen Option : 1

Q.4 A casting process in which molten metal is poured in a mould and allowed to solidify while the mould is revolving is known as:

- Ans
- ☒ 1. Die casting
 - ☒ 2. Investment casting
 - ☒ 3. Centrifugal casting
 - ☒ 4. Continuous casting

Question ID : 16794327866
Status : Answered
Chosen Option : 3

Q.4 In an arc welding process, the voltage and current are 25 Volts and 300 amperes respectively. The arc heat transfer efficiency is 0.85 and welding speed is 8 mm/s. the net heat input (in J/mm) will be:

- Ans
- ☒ 1. 796.8
 - ☒ 2. 684.2
 - ☒ 3. 620.7
 - ☒ 4. 721.6

Question ID : 16794327868
Status : Answered
Chosen Option : 1

Q.4 Pitot tube is used to:

- Ans
- ☒ 1. Velocity of flow
 - ☒ 2. Volume flow rate
 - ☒ 3. Humidity of air
 - ☒ 4. Temperature of fluid

Question ID : 16794327856
Status : Answered
Chosen Option : 1

Q.4 Two elastic bars of equal length and same material, one is of circular cross-section of 80 mm diameter and the other of square cross-section of 80 mm side. Both absorbs same amount of strain energy under axial force. What will be the ratio of stress in circular cross-section to that of square cross-section?

- Ans
- ☒ 1. 0.972
 - ☒ 2. 0.886
 - ☒ 3. 1.013
 - ☒ 4. 1.128

Question ID : 16794327832
Status : Answered
Chosen Option : 3

Q.5 Ball and socket joint is an example of:

- Ans
- ☒ 1. Turning pair
 - ☒ 2. Spherical pair
 - ☒ 3. Sliding pair
 - ☒ 4. Screw pair

Question ID : 16794327847
Status : Answered
Chosen Option : 2

Q.5 For Froude model law, scale ratio of force and scale ratio of length are related as: [Assuming the experiment is conducted on same place and in same fluid]

- Ans
- ☒ 1. Scale ratio of force = Scale ratio of length
 - ☒ 2. Scale ratio of force = (Scale ratio of length)⁴
 - ☒ 3. Scale ratio of force = (Scale ratio of length)²
 - ☒ 4. Scale ratio of force = (Scale ratio of length)³

Question ID : 16794327804
Status : Answered
Chosen Option : 4

Q.5 Complete the sentence: "The function of the _____ is to increase the temperature of air before it enters the furnace".

- Ans
- ☒ 1. Air preheater
 - ☒ 2. Super heater
 - ☒ 3. Injector
 - ☒ 4. Economizer

Question ID : 16794327816
Status : Answered
Chosen Option : 1

Q.5 Steam enters a condenser at 35 °C [$P_{\text{sat}@35^\circ\text{C}} = 42.21 \text{ mm of Hg}$]. Barometer reading is 760 mm of Hg and vacuum of 690 mm Hg is recorded in the condenser. The vacuum efficiency will be given by:

- Ans
- ☒ 1. 86.01 %
 - ☒ 2. 82.30 %
 - ☒ 3. 96.10 %
 - ☒ 4. 80.23 %

Question ID : 16794327821
Status : Answered
Chosen Option : 3

Q.5 What will be the drag force exerted on a flat plate of size 2 m x 2 m, when the plate is moving at speed of 4 m/s normal to its plane in water? [Consider, Coefficient of drag = 1.2]

- Ans
- ☒ 1. 38.4 kN

- ☒ 2. 32.2 kN
☒ 3. 45.7 kN
☒ 4. 40.2 kN

Question ID : 16794327806
 Status : Answered
 Chosen Option : 1

Q.5 A turbine develops 10 MW when running at 100 rpm under the head of 30 m. If the head is reduced to 20 m, the speed and power developed will be respectively given as [given $\sqrt{1.5} = 1.22$]

- Ans ☒ 1. 97.62 rpm, 5.46 MW
☒ 2. 81.96 rpm, 4.82 MW
☒ 3. 97.62 rpm, 4.82 MW
☒ 4. 81.96 rpm, 5.46 MW

Question ID : 16794327811
 Status : Answered
 Chosen Option : 4

Q.5 An isentropic air-turbine is used to supply 0.1 kg/s of air at 0.1 MN/m² and 285 K to a cabin. The pressure at inlet to the turbine is 0.4 MN/m². What will be the power developed by the turbine? [Consider $C_p = 1$ kJ/kg-K, $\gamma = 1.41$, $4^{\frac{0.41}{1.41}} = 1.5$]

- Ans ☒ 1. 14.25 kW
☒ 2. 10.25 kW
☒ 3. 6.75 kW
☒ 4. 8.25 kW

Question ID : 16794327822
 Status : Answered
 Chosen Option : 1

Q.5 A simply supported beam of length L carrying a concentrated load W at a section which is at a distance of ' x ' from one end. What will be the value of bending moment at this section?

- Ans ☒ 1. $W(x - x^2)$
☒ 2. $W(x^2 - xL)$
☒ 3. $W\left(x - \frac{x^2}{L}\right)$
☒ 4. Wx

Question ID : 16794327835
 Status : Answered
 Chosen Option : 3

Q.5 In a double pipe counter-flow heat exchanger, 10,000 kg/hr of oil [$C_p = 2.09$ kJ/kg-K] is cooled from 80 °C to 50 °C by water [$C_p = 4.18$ kJ/kg-K] of flow rate 8000 kg/hr entering at 25 °C. What will be outlet temperature of water?

- Ans ☒ 1. 63.75 °C
☒ 2. 52.55 °C

☒ 3. 48.15 °C

☒ 4. 43.75 °C

Question ID : 16794327787

Status : Answered

Chosen Option : 4

Q.5 The degree of reaction is given by

Ans

☒ 1. $\frac{\text{Actual enthalpy change in rotor}}{\text{Actual enthalpy change in stator}}$

☒ 2. $\frac{\text{Actual enthalpy change in rotor}}{\text{Actual enthalpy change in stage}}$

☒ 3. $\frac{\text{Actual enthalpy change in stage}}{\text{Actual enthalpy change in rotor}}$

☒ 4. $\frac{\text{Actual enthalpy change in stator}}{\text{Actual enthalpy change in rotor}}$

Question ID : 16794327827

Status : Answered

Chosen Option : 2

Q.6 The capacity of material to absorb the energy within elastic limit is known as:

Ans

☒ 1. Resilience

☒ 2. Elasticity

☒ 3. Hardness

☒ 4. Toughness

Question ID : 16794327858

Status : Answered

Chosen Option : 1

Q.6 Which of the following equation is valid for the maximum efficiency of square threaded screw?

[where α = Helix angle , ϕ = Friction angle]

Ans

☒ 1. $\alpha = (90 - \phi)$ degree

☒ 2. $\phi = (90 + \alpha)$ degree

☒ 3. $\alpha = \left(45 - \frac{\phi}{2}\right)$ degree

☒ 4. $\phi = \left(45 - \frac{\alpha}{2}\right)$ degree

Question ID : 16794327840

Status : Answered

Chosen Option : 3

Q.6

2 The ratio of shearing stress to shear strain is known as:

- Ans
- ☐ 1. Poisson's ratio
 - ☐ 2. Bulk modulus
 - ☐ 3. Modulus of elasticity
 - ☒ 4. Modulus of rigidity

Question ID : 16794327831

Status : Answered

Chosen Option : 4

Q.6 The pressure ratio and maximum temperature of Brayton cycle are 5:1 and 928 K respectively. Air enters the compressor at 1 bar and 300 K. What will be the network output of the cycle per kg of air flow?

[Consider, $C_p = 1.0 \text{ kJ/kg-K}$, $\gamma = 1.41$, $5^{\frac{0.41}{1.41}} = 1.6$]

- Ans
- ☐ 1. 256 kJ/kg
 - ☐ 2. 205 kJ/kg
 - ☐ 3. 120 kJ/kg
 - ☒ 4. 168 kJ/kg

Question ID : 16794327823

Status : Answered

Chosen Option : 4

Q.6 The command in AutoCAD which is used to bevel the edge of object is known as:

- Ans
- ☐ 1. Offset
 - ☒ 2. Chamfer
 - ☐ 3. Fillet
 - ☐ 4. Stretch

Question ID : 16794327887

Status : Answered

Chosen Option : 2

Q.6 Which of the following is correct for flexible shaft?

- Ans
- ☐ 1. It has very low rigidity both in bending and torsion
 - ☐ 2. It has very high rigidity in bending and low rigidity in torsion
 - ☒ 3. It has low rigidity in bending and high rigidity in torsion
 - ☐ 4. It has very high rigidity both in bending and torsion

Question ID : 16794327845

Status : Answered

Chosen Option : 4

Q.6 Loading coefficient of an axial flow compressor for a given stage work is [where, u is the peripheral velocity of rotor]

6

- Ans
- ☒ 1. Inversely proportional to \sqrt{u}
 - ☒ 2. Inversely proportional to u^2
 - ☒ 3. Directly proportional to u^2
 - ☒ 4. Directly proportional to u

Question ID : 16794327826
Status : Answered
Chosen Option : 3

Q.6
7 The coefficient of performance of vapor compression refrigeration system:

- Ans
- ☒ 1. Decreases with the decrease in evaporator temperature at fixed condenser temperature
 - ☒ 2. Increases with the increase in condenser temperature at fixed evaporator temperature
 - ☒ 3. Remains constant with the decrease in evaporator temperature at fixed condenser temperature
 - ☒ 4. Increases with the decrease in evaporator temperature at fixed condenser temperature

Question ID : 16794327789
Status : Answered
Chosen Option : 1

Q.6
8 Which of the following is an artificial abrasive used in grinding wheel?

- Ans
- ☒ 1. Sandstone
 - ☒ 2. Corundum
 - ☒ 3. Silicon carbide
 - ☒ 4. Emery

Question ID : 16794327872
Status : Answered
Chosen Option : 2

Q.6
9 Which of the following is the correct relation of shearing force (F) and bending moment (M) at a section?

- Ans
- ☒ 1. $F = \frac{d^2 M}{dx^2}$
 - ☒ 2. $M = \frac{d^2 F}{dx^2}$
 - ☒ 3. $F = \frac{dM}{dx}$
 - ☒ 4. $M = \frac{dF}{dx}$

Question ID : 16794327833
Status : Answered
Chosen Option : 3

Q.7
0 $\frac{\partial^2 T}{\partial x^2} + \frac{\partial^2 T}{\partial y^2} + \frac{\partial^2 T}{\partial z^2} = 0$ is an equation for: [where, T = Temperature]

Ans ☒ 1.

3-D, transient heat conduction equation with no heat generation and with constant thermal conductivity in Cartesian coordinates

☒ 2.

3-D, steady state heat conduction equation with heat generation and with constant thermal conductivity in Cartesian coordinates

☒ 3.

3-D, steady state, heat conduction equation with no heat generation and with temperature dependent thermal conductivity in Cartesian coordinates

☒ 4.

3-D, steady state heat conduction equation with no heat generation and with constant thermal conductivity in Cartesian coordinates

Question ID : 16794327783

Status : Answered

Chosen Option : 4

Q.7
1 A heat engine receives half of its heat supply at 1000 K and remaining half at 500 K. Heat is rejected to the sink at 300 K. The maximum thermal efficiency of the heat engine will be:

Ans ☒ 1. 55%

☒ 2. 10%

☒ 3. 45%

☒ 4. 65%

Question ID : 16794327778

Status : Answered

Chosen Option : 1

Q.7
2 In laser beam machining process, the usable range of wavelength of laser beam is:

Ans ☒ 1. 400 – 600 μm

☒ 2. 0.4 – 0.6 μm

☒ 3. 0.001 – 0.01 μm

☒ 4. 600 – 1000 μm

Question ID : 16794327877

Status : Answered

Chosen Option : 3

Q.7
3 Air is designated as

Ans ☒ 1. R729

☒ 2. R764

☒ 3. R732

☒ 4. R744

Question ID : 16794327792

Status : Answered

Chosen Option : 1

Q.7 An electric generator coupled to a windmill produces an average electric power of 6 kW. The power is used to charge a storage battery. Heat transfer from the battery to the surroundings is 0.3 kW. What will be the amount of energy stored in the battery in 2 hours?

- Ans
- ☒ 1. 41040 kW
 - ☒ 2. 114 kJ
 - ☒ 3. 11.4 kJ
 - ☒ 4. 41040 kJ

Question ID : 16794327770

Status : Answered

Chosen Option : 4

Q.7 Elongation of a bar of uniform cross-sectional area of A and length L due to self-weight is given as:
5 [Consider Density of bar material = ρ , Modulus of elasticity = E , acceleration due to gravity = g]

- Ans
- ☒ 1. $\frac{\rho g L^2}{4E}$
 - ☒ 2. $\frac{\rho g L}{2E}$
 - ☒ 3. $\frac{\rho g L^2}{6E}$
 - ☒ 4. $\frac{\rho g L^2}{2E}$

Question ID : 16794327829

Status : Answered

Chosen Option : 4

Q.7 A simply supported beam of span L and carrying a concentrated load of W at mid span. The value of deflection at mid span will be [E = modulus of elasticity, I = moment of inertia of section of beam]

- Ans
- ☒ 1. $\frac{WL^2}{48EI}$
 - ☒ 2. $\frac{WL^3}{48EI}$
 - ☒ 3. $\frac{WL^4}{48EI}$
 - ☒ 4. $\frac{WL^3}{30EI}$

Question ID : 16794327836

Status : Answered

Chosen Option : 2

Q.7 Which of the following is a line defect?

- Ans
- ☒ 1. Edge dislocation
 - ☒ 2. Impurity

☒ 3. Twinning

☒ 4. Vacancy

Question ID : 16794327860

Status : Answered

Chosen Option : 1

Q.7
8 The unit of thermal diffusivity is:

Ans ☒ 1. $\text{kg} - \text{m}^2/\text{s}$

☒ 2. m^2 / s

☒ 3. m^4 / s^2

☒ 4. $\text{m}^2 / \text{kg-s}$

Question ID : 16794327782

Status : Answered

Chosen Option : 2

Q.7
9 Main alloying element of brass is:

Ans ☒ 1. Iron

☒ 2. Tin

☒ 3. Zinc

☒ 4. Carbon

Question ID : 16794327862

Status : Answered

Chosen Option : 3

Q.8
0 Which of the following is the inversion of single slider-crank chain?

Ans ☒ 1. Elliptical trammel

☒ 2. Scotch yoke

☒ 3. Oldham's coupling

☒ 4. Whitworth quick-return mechanism

Question ID : 16794327848

Status : Answered

Chosen Option : 4

Q.8 Bernoulli's equation for compressible flows undergoing adiabatic process is given by:

1 [where γ = Ratio of specific heat, P = Pressure, v = velocity, Z = datum head, g = acceleration due to gravity]

Ans ☒ 1. $\frac{P}{\rho g} \ln P + \frac{v^2}{2g} + Z = \text{Constant}$

☒ 2. $\left(\frac{\gamma}{\gamma - 1}\right) \frac{P}{\rho g} + \frac{v^2}{2g} + Z = \text{Constant}$

✗ 3. $\frac{P}{(\gamma - 1)\rho g} + \frac{v^2}{2g} + Z = \text{Constant}$

✗ 4. $\frac{dv}{v} + \frac{dA}{A} + \frac{d\rho}{\rho} = 0$

Question ID : 16794327807

Status : Answered

Chosen Option : 2

Q.8 Total torque transmitted by a single plate clutch (both sides are effective) with axial spring load of 1 kN, inner radii 10 cm and outer radii 15 cm will be [Consider coefficient of friction as 0.5, assuming uniform wear]?

- Ans
- ✗ 1. 75 N-m
 - ✗ 2. 150 N-m
 - ✗ 3. 100 N-m
 - ✓ 4. 125 N-m

Question ID : 16794327842

Status : Answered

Chosen Option : 4

Q.8 In an engine working on an ideal Otto cycle, the temperature at the beginning and at the end of compression are 300 K and 600 K respectively. What will be the air-standard efficiency of the engine? [Consider $\gamma = 1.4$]

- Ans
- ✓ 1. 50%
 - ✗ 2. 45%
 - ✗ 3. 55%
 - ✗ 4. 40%

Question ID : 16794327777

Status : Answered

Chosen Option : 1

Q.8 In an ECM with a pure iron work piece, MRR of 5 cm³/min is required. What will be the required current? [gram atomic weight of iron = 56g, valency = 2, density of iron = 7.8g/cm³ and F = 96500 coulomb]

- Ans
- ✗ 1. 224 amp
 - ✗ 2. 2.24 amp
 - ✓ 3. 2240 amp
 - ✗ 4. 22.4 amp

Question ID : 16794327876

Status : Answered

Chosen Option : 2

Q.8 Which of the following is not related to the cam profile?

- Ans
- ✗ 1. Prime circle
 - ✗ 2. Trace point
 - ✓ 3. Addendum

☒ 4. Base circle

Question ID : 16794327849

Status : Answered

Chosen Option : 3

Q.8 An inward flow reaction turbine has following data:

6 Head available = 25 m

Velocity of flow = 2.5 m/s (constant)

Guide blade angle = 10°

Runner vanes are radial at inlet and discharge at outlet is radial. What will be the approximate hydraulic efficiency of turbine? [given, $\tan 10^\circ = 0.175$, $g = 10 \text{ m/s}^2$]

Ans ☒ 1. 95.34%

☒ 2. 70.23%

☒ 3. 61.32%

☒ 4. 81.63%

Question ID : 16794327810

Status : Answered

Chosen Option : 4

Q.8 A single-acting, single cylinder reciprocating air compressor is compressing 20 kg/min of air from 110 kPa and 300K to

7 600 kPa according to $PV^{1.25} = \text{Constants}$. Mechanical efficiency is 80%. What is the power input to the compressor [R

$= 0.287 \text{ kJ/kg-K}$, $\left(\frac{60}{11}\right)^{0.2} = 1.4$, Neglect clearance, leakage and cooling]?

Ans ☒ 1. 39.23 kW

☒ 2. 58.54 kW

☒ 3. 27.38 kW

☒ 4. 71.75 kW

Question ID : 16794327824

Status : Answered

Chosen Option : 2

Q.8 The statement "The efficiency of all reversible heat engines operating between the same temperature levels is the same"

8 is known as:

Ans ☒ 1. Corollary of Carnot theorem

☒ 2. Zeroth law of thermodynamics

☒ 3. First law of thermodynamics

☒ 4. Third law of thermodynamics

Question ID : 16794327771

Status : Answered

Chosen Option : 1

Q.8 A centrifugal pump has an impellor of outer diameter of 30 cm. Water enters the impellor radially. Vane tips are radial at

9 outlet. The rotative speed is 1500 rpm and manometry efficiency is 80%. What is the net head developed (in meter)?

[assuming acceleration due to gravity = $g = \pi$]

Ans ☒ 1. 45

☒ 2. 60

- ☐ 3. 70
☐ 4. 100

Question ID : 16794327814
Status : Answered
Chosen Option : 2

Q.9 Maximum MRR of EDM process is approximately given by:

- Ans ☒ 1. $5000 \text{ mm}^3/\text{min}$
☐ 2. $5 \times 10^5 \text{ mm}^3/\text{min}$
☐ 3. $50 \text{ mm}^3/\text{min}$
☐ 4. $0.5 \text{ mm}^3/\text{min}$

Question ID : 16794327875
Status : Answered
Chosen Option : 1

Q.9 "A process through which the cross-sectional of a metal piece is increased with a corresponding reduction in its length" is known as:

- Ans ☐ 1. Punching
☐ 2. Bending
☒ 3. Upsetting
☐ 4. Drawing out

Question ID : 16794327863
Status : Answered
Chosen Option : 3

Q.9 Demand for a product is 12,50,000 per annum. Company purchase this product in lots and sells them. The cost of purchase order is ₹ 1500 and cost of storage is ₹ 150 per piece per annum. EOQ will be:

- Ans ☐ 1. 6000
☐ 2. 7000
☐ 3. 8000
☒ 4. 5000

Question ID : 16794327878
Status : Answered
Chosen Option : 4

Q.9 The whole area behind the dam draining into a stream or river across which the dam is constructed is known as:

- Ans ☐ 1. Surge tank
☒ 2. Catchment area
☐ 3. Spillways
☐ 4. Reservoir

Question ID : 16794327884
Status : Answered
Chosen Option : 3

Q.9 Which of the following is the fusion welding process?

- Ans
- ☒ 1. Forge welding
 - ☒ 2. Gas welding
 - ☒ 3. Resistance welding
 - ☒ 4. Thermit welding with pressure

Question ID : 16794327867
Status : Answered
Chosen Option : 2

Q.9 What will be the ratio of stagnation temperature to critical temperature for isentropic flow of an ideal gas [Consider $\gamma = 1.289$]

- Ans
- ☒ 1. 1.0445
 - ☒ 2. 0.9721
 - ☒ 3. 0.8733
 - ☒ 4. 1.1445

Question ID : 16794327809
Status : Answered
Chosen Option : 4

Q.9 For Parson's reaction turbine, which of the following condition is correct? [Where, α = Nozzle angle, ϕ = Exit angle of moving blade, θ = Entrance angle of moving blade, β = angle which the discharging steam makes with the tangent of the wheel at the exit of moving blade]

- Ans
- ☒ 1. $\theta = \alpha, \phi = \beta$
 - ☒ 2. $\theta = \beta, \phi = \alpha$
 - ☒ 3. $\theta = \phi, \beta = \alpha$
 - ☒ 4. $\theta = \beta = \phi = \alpha$

Question ID : 16794327820
Status : Answered
Chosen Option : 2

Q.9 Which of the following relation is correct for fin effectiveness? [where k = thermal conductivity of fin material, p = perimeter of the fin, A = cross sectional area of fin, h = convective heat transfer coefficient]

- Ans
- ☒ 1. $\sqrt{\frac{kA}{hp}}$
 - ☒ 2. $\sqrt{\frac{kph}{A}}$

✓ 3. $\sqrt{\frac{kp}{hA}}$

✗ 4. $\sqrt{\frac{kh}{pA}}$

Question ID : 16794327785

Status : Answered

Chosen Option : 3

Q.9
8 “SCALE” command in AutoCAD is used to:

- Ans
- ✗ 1. To create multiple copies of the object
 - ✗ 2. Measure the dimension of the object
 - ✓ 3. Enlarge or reduce the object proportionally
 - ✗ 4. To rotate the object or a part of it around a point

Question ID : 16794327886

Status : Answered

Chosen Option : 3

Q.9
9 What will be the approximate velocity (in m/s) of bullet fired in standard air (Temperature of air = 300K) if the Mach angle is 30° [$R = 0.28 \text{ kJ/kg-K}$, $\gamma = 1.4$].

- Ans
- ✗ 1. $560\sqrt{6}$
 - ✗ 2. $140\sqrt{6}$
 - ✗ 3. $70\sqrt{6}$
 - ✓ 4. $280\sqrt{6}$

Question ID : 16794327808

Status : Answered

Chosen Option : 2

Q.1
00 The duct is said to be low velocity duct if the mean velocity of air in the duct:

- Ans
- ✗ 1. $20 \text{ m/s} < V < 25 \text{ m/s}$
 - ✓ 2. $V < 10 \text{ m/s}$
 - ✗ 3. $25 \text{ m/s} < V < 30 \text{ m/s}$
 - ✗ 4. $15 \text{ m/s} < V < 20 \text{ m/s}$

Question ID : 16794327793

Status : Answered

Chosen Option : 4

Q.1
01

A company has the data of a product as:

Fixed cost/month = ₹ 60,000

Variable cost/unit = ₹ 210

Selling price/unit = ₹ 320

Production capacity = 1600 unit/month.

If the production is carried out at 80% of the rated capacity, what will be the monthly profit?

Ans ☒ 1. ₹ 80,800

☐ 2. ₹ 90,900

☐ 3. ₹ 85,850

☐ 4. ₹ 75,750

Question ID : 16794327879

Status : Answered

Chosen Option : 1

Q.1 For a heat engine cycle, which of the following relation is always true? [Q = heat transfer, W=Work transfer]

02

Ans ☐ 1. $\sum_{cycle} Q = 0, \sum_{cycle} W = 0$

☒ 2. $\sum_{cycle} Q = \sum_{cycle} W$

☐ 3. $\sum_{cycle} Q > \sum_{cycle} W$

☐ 4. $\sum_{cycle} Q < \sum_{cycle} W$

Question ID : 16794327779

Status : Answered

Chosen Option : 2

Q.1 Atomic packing factor for FCC structure is:

03

Ans ☐ 1. 0.68

☐ 2. 0.52

☒ 3. 0.74

☐ 4. 0.62

Question ID : 16794327859

Status : Answered

Chosen Option : 3

Q.1 At a point in a stressed body there are normal stresses of 1N/mm^2 (tensile) on a vertical plane and 0.5N/mm^2 (tensile) on a horizontal plane. The shearing stresses on these planes are zero. What will be the normal stress on a plane making an angle 50° with vertical plane? [given, $(\cos 50^\circ)^2 = 0.413$]

04

Ans ☐ 1. 0.6015N/mm^2

✗ 2. 0.4139 N/mm^2

✗ 3. 0.5312 N/mm^2

✓ 4. 0.7065 N/mm^2

Question ID : 16794327830

Status : Answered

Chosen Option : 4

Q.1
05 A device which is used to reduce the cyclic fluctuations of speed of an engine is known as:

Ans ✗ 1. Inlet and exhaust valve

✗ 2. Piston ring

✗ 3. Clutch

✓ 4. Flywheel

Question ID : 16794327850

Status : Answered

Chosen Option : 4

Q.1
06 The work input in reciprocating air compressor for same inlet state and same exit pressure is minimum when:

Ans ✗ 1. Compression follow $Pv^{1.4} = \text{Constant}$

✓ 2. Compression follow $Pv = \text{Constant}$

✗ 3. Compression follow $Pv^{1.3} = \text{Constant}$

✗ 4. Compression follow $Pv^{1.2} = \text{Constant}$

Question ID : 16794327825

Status : Answered

Chosen Option : 2

Q.1
07 Two identical pumps having the same discharge (Q) and working against the same head (H). If they are connected in parallel, which of the following is correct?

Ans ✓ 1. Combined discharge = 2Q

Combined head = H

✗ 2. Combined discharge = Q

Combined head = 2H

✗ 3. Combined discharge = 4Q

Combined head = H/2

✗ 4. Combined discharge = 2Q

Combined head = 2H

Question ID : 16794327815

Status : Answered

Chosen Option : 1

Q.1

08 An objective function is $p(x, y) = 3x + 9y$ and constraints are,

$$x + y \leq 8,$$

$$x + 2y \leq 4,$$

$$x \geq 0,$$

$$y \geq 0$$

The maximum value of objective function is:

Ans ☒ 1. 18

☐ 2. 24

☐ 3. 30

☐ 4. 12

Question ID : 16794327881

Status : Answered

Chosen Option : 1

Q.1 09 Steam rate is defined as [where Q = Heat input to cycle (kW), W_{net} = Shaft output (kW)]

Ans ☐ 1. $\frac{1}{W_{net}} (kg/kWh)$

☐ 2. $\frac{3600 Q}{W_{net}} (kJ/kWh)$

☐ 3. $\frac{Q}{W_{net}} (kJ/kWh)$

☒ 4. $\frac{3600}{W_{net}} (kg/kWh)$

Question ID : 16794327855

Status : Answered

Chosen Option : 4

Q.1 10 A refrigerator with a COP of 2 removes the heat from the refrigerated space at the rate of 100 kJ/min. The amount of heat rejected to surroundings will be:

Ans ☐ 1. 2.0 kW

☐ 2. 3.0 kW

☐ 3. 1.5 kW

☒ 4. 2.5 kW

Question ID : 16794327790

Status : Answered

Chosen Option : 4

Q.1 11 Arrivals at a bank counter are considered to be Poisson distribution, with an average time of 12 min between two successive arrivals. The time required to serve is distributed exponentially with a mean of 3 min. The probability that an arrival does not have to wait is before service:

Ans ☐ 1. 0.25

☒ 2. 0.75

☐ 3. 0.9

☐ 4. 0.5

Question ID : 16794327883

Status : Answered

Chosen Option : 2

Q.1 The humidity ratio of atmospheric air at 28°C [$P_{\text{sat@28°C, water}} = 28.34 \text{ mm Hg}$] dry bulb temperature and 760 mm Hg pressure is 0.018 kg/kg of dry air. What will be the relative humidity of air?

- Ans
- ☒ 1. 96.13%
 - ☒ 2. 75.42%
 - ☒ 3. 55.25%
 - ☒ 4. 88.35%

Question ID : 16794327791

Status : Answered

Chosen Option : 2

Q.1 A non-flow reversible process takes place according to $V = \frac{15}{P} \text{ m}^3$, where P is in bar. What will be the work done if pressure changes from 1 bar to 10 bar? [Given, $\ln(10) = 2.3025$]

- Ans
- ☒ 1. 3.453 MN-m, expansion
 - ☒ 2. 3.453 N-m, compression
 - ☒ 3. 3.453 MN-m, compression
 - ☒ 4. 3.453 N-m, expansion

Question ID : 16794327768

Status : Answered

Chosen Option : 3

Q.1 Critical radius of insulation for cylindrical pipe is given by [where k = Thermal conductivity of insulating material, h = External convective heat transfer coefficient]

- Ans
- ☒ 1. $\frac{2h}{k}$
 - ☒ 2. $\frac{k}{2h}$
 - ☒ 3. $\frac{h}{k}$
 - ☒ 4. $\frac{k}{h}$

Question ID : 16794327784

Status : Answered

Chosen Option : 4

Q.1 If the atmospheric pressure at sea level is 10.144 N/cm², what will be the absolute pressure at the height of 3 km from sea level? [Pressure variation may be assumed to follow hydrostatic law, density of air is assumed constant as 1.2 kg/m³]

- Ans
- ☒ 1. 7.612 N/cm²
 - ☒ 2. 13.675 N/cm²

- ☒ 3. 8.612 N/cm^2
☒ 4. 6.612 N/cm^2

Question ID : 16794327796
 Status : Answered
 Chosen Option : 4

Q.1 The pressure of air in an automobile tyre at temperature of 27°C is 1.75 bar (gauge). Due to running, the temperature of
 16 air in the tyre rises to 87°C . What will be the gauge pressure during this running? [$P_{\text{atm}} = 1.01 \text{ bar}$, volume of tyre is assumed constant]

- Ans ☒ 1. 2.302 bar
☒ 2. 2.914 bar
☒ 3. 1.677 bar
☒ 4. 3.180 bar

Question ID : 16794327775
 Status : Answered
 Chosen Option : 1

Q.1 Maximum value of shear stress for a hollow shaft of outer and inner diameter D and d will be: [where T = Applied
 17 torque]

- Ans ☒ 1. $\frac{16TD}{\pi(D^3 - d^3)}$
☒ 2. $\frac{16TD}{\pi(D^4 - d^4)}$
☒ 3. $\frac{16T}{\pi(D^4 - d^4)}$
☒ 4. $\frac{16T}{\pi(D^3 - d^3)}$

Question ID : 16794327838
 Status : Answered
 Chosen Option : 2

Q.1 A flywheel absorbs 24 kJ of energy while increasing its speed from 210 rpm to 214 rpm . What will be its kinetic energy
 18 at 220 rpm ?

- Ans ☒ 1. 825.1 kJ
☒ 2. 790.4 kJ
☒ 3. 936.4 kJ
☒ 4. 684.9 kJ

Question ID : 16794327851
 Status : Answered
 Chosen Option : 4

Q.1 Angle of twist of a solid shaft of torsional rigidity GJ , length L and applied torque T will be given by:
 19

Ans

☐ 1. $\frac{T}{GJL}$

☐ 2. $\frac{L}{GJT}$

☒ 3. $\frac{TL}{GJ}$

☐ 4. $\frac{GJ}{TL}$

Question ID : 16794327839

Status : Answered

Chosen Option : 3

Q.1 A shaft runs at 80 rpm and drives another shaft at 150 rpm through belt drive. The diameter of driving pulley is 600 mm. What will be the diameter of driven pulley assuming belt thickness as 5 mm?

Ans ☐ 1. 320.00 mm

☐ 2. 300.12 mm

☒ 3. 317.67 mm

☐ 4. 304.85 mm

Question ID : 16794327846

Status : Answered

Chosen Option : 2

Section : General Ability

Q.1 Introducing Deepika, Murali said, "Her father is the only son of my father". How is Deepika related to Murali?

Ans ☒ 1. Daughter

☐ 2. Aunt

☐ 3. Mother

☐ 4. Sister

Question ID : 16794327890

Status : Answered

Chosen Option : 1

Q.2 All surfaces of a cube are coloured. If a number of smaller cubes are taken out from it, each side $\frac{1}{4}$ th the size of the original cube's side, indicate the number of cubes with only one side painted.

Ans ☐ 1. 18

☐ 2. 20

☐ 3. 16

☒ 4. 24

Question ID : 16794327897

Status : Answered

Chosen Option : 3

Q.3 Choose the correct alternative for the following:

258 : 16 :: 326 : -----

- Ans
- ☒ 1. 17
 - ☒ 2. 22
 - ☒ 3. 18
 - ☒ 4. 19

Question ID : 16794327896
Status : Answered
Chosen Option : 3

Q.4 Select the option that will correctly replace the question mark (?) in the series.

0, 7, 26, 63, 124, 215, ?, 511

- Ans
- ☒ 1. 297
 - ☒ 2. 342
 - ☒ 3. 345
 - ☒ 4. 324

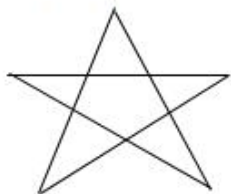
Question ID : 16794327891
Status : Answered
Chosen Option : 3

Q.5 A father said to his daughter, "I was of your present age when you were born". If father is 62 years of age today, how old his daughter 5 years ago?

- Ans
- ☒ 1. 30 years
 - ☒ 2. 26 years
 - ☒ 3. 27 years
 - ☒ 4. 28 years

Question ID : 16794327895
Status : Answered
Chosen Option : 2

Q.6 Find the number of triangles from the following figure:



- Ans
- ☒ 1. 6
 - ☒ 2. 10
 - ☒ 3. 8
 - ☒ 4. 5

Question ID : 16794327893
Status : Answered
Chosen Option : 3

Q.7 Four numbers have been given out of which three are alike in some manner, while the fourth one is different. Choose out the odd one.

- Ans
- ☒ 1. 196
 - ☒ 2. 225
 - ☒ 3. 169
 - ☒ 4. 199

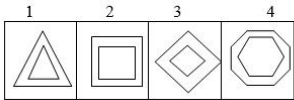
Question ID : 16794327894
Status : Answered
Chosen Option : 4

Q.8 In a certain code 'PHYSICS' is written 'YHPSSCI' and 'BIOLOGY' is written as 'OIBLYGO'. How will be 'SCIENCE' written in that code?

- Ans
- ☒ 1. CISEECN
 - ☒ 2. ISCEEEN
 - ☒ 3. ICSEECN
 - ☒ 4. ICSECEN

Question ID : 16794327892
Status : Answered
Chosen Option : 3

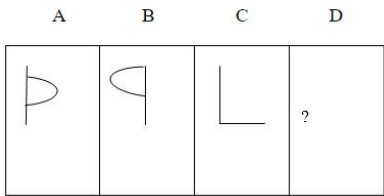
Q.9 In problem, out of four figures marked 1, 2, 3 and 4, three are similar in a certain manner. However one figure is not like the other three. Choose the figure which is different from the rest.



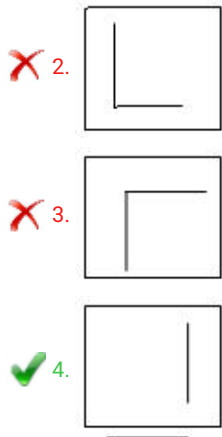
- Ans
- ☒ 1. 1
 - ☒ 2. 4
 - ☒ 3. 3
 - ☒ 4. 2

Question ID : 16794327889
Status : Answered
Chosen Option : 4

Q.1 The following question consists of two sets of figure A, B, C and D constitute the problem set while option figures 1, 2, 3 and 4 constitute the answer set. There is a definite relationship between figures A and B. Establish a similar relationship between figures C and D by selecting a suitable figure from the answer set that would replace the question mark (?) in figure D.



- Ans
- ☒ 1.



Question ID : 16794327888
Status : Answered
Chosen Option : 3

Q.1 1 A person reads $\frac{3}{8}$ of a book on a day and $\frac{4}{5}$ of the remaining pages, on the next day. If the number of pages still unread are 30, then the number pages of the book is:

- Ans
- ✗ 1. 260
 - ✓ 2. 240
 - ✗ 3. 200
 - ✗ 4. 320

Question ID : 16794327902
Status : Answered
Chosen Option : 2

Q.1 2 If the surface area of a cube is 1536 cm^2 , then its volume is:

- Ans
- ✓ 1. 4096 cm^3
 - ✗ 2. 512 cm^3
 - ✗ 3. 729 cm^3
 - ✗ 4. 1728 cm^3

Question ID : 16794327906
Status : Answered
Chosen Option : 1

Q.1 3 For a two-digit number, the sum of its digits is 9 . Suppose the digits are reversed, then the difference between original number and the new number is also 9 . What is the number?

- Ans
- ✗ 1. 27
 - ✗ 2. 36
 - ✓ 3. 54
 - ✗ 4. 18

Question ID : 16794327898
Status : Answered
Chosen Option : 3

Q.1 The rate of compound interest at which ₹ 1000 becomes ₹ 5000 in 8 years is:

- Ans ☒ 1. 22.28%
☒ 2. 22.24%
☒ 3. 26.31%
☒ 4. 24.56%

Question ID : 16794327901
Status : Answered
Chosen Option : 3

Q.1 The volume of a cylindrical tank is $12,320 \text{ m}^3$. If the radius of the base is 14 m, then the depth of the tank is: ($\pi = \frac{22}{7}$)

- Ans ☒ 1. 20 m
☒ 2. 15 m
☒ 3. 10 m
☒ 4. 25 m

Question ID : 16794327907
Status : Answered
Chosen Option : 1

Q.1 The average weight of X, Y and Z is 45 kg. If the average weight of X and Y is 40 kg and that of Y and Z is 43 kg, then the weight of Y is:

- Ans ☒ 1. 31 kg
☒ 2. 30 kg
☒ 3. 32 kg
☒ 4. 27 kg

Question ID : 16794327899
Status : Answered
Chosen Option : 1

Q.1 A sum of ₹ 9300 is distributed between A, B and C in such a way that 2 times the share of A, 3 times the share of B and 5 times the share of C are equal. Then the share of A is:

- Ans ☒ 1. 4500
☒ 2. 2500
☒ 3. 4750
☒ 4. 2250

Question ID : 16794327903
Status : Answered
Chosen Option : 1

Q.1 Two friends X and Y started a business in a partnership with ₹ 50,000 and ₹ 60,000 respectively. X is the working partner and so he gets 10% of the total profit for taking care of the business. The amount of share of Y less than the share of X, in the profit of ₹ 55,000 is:

Ans

- ☐ 1. ₹ 500
☐ 2. ₹ 1500
☐ 3. ₹ 2000
☒ 4. ₹ 1000

Question ID : 16794327905
Status : Answered
Chosen Option : 1

Q.1 If the sides of a square are increased by 10%, then the percentage of increase in its area is:

- Ans ☐ 1. 11%
☐ 2. 41%
☒ 3. 21%
☐ 4. 31%

Question ID : 16794327900
Status : Answered
Chosen Option : 3

Q.2 A person X, bought a cow for ₹ 9000. He sold the cow to Y at 10% loss of cost price. Again Y sold the cow to X at 10% profit. The gain or loss happened to X in total transaction is:

- Ans ☐ 1. Profit of ₹ 900
☐ 2. Profit of ₹ 810
☒ 3. Loss of ₹ 810
☐ 4. Loss of ₹ 900

Question ID : 16794327904
Status : Answered
Chosen Option : 3

Q.2 The Constitution (One Hundred and First Amendment) Act which explains the Goods and Services Tax (GST) was enacted in the year _____.

- Ans ☐ 1. 2017
☐ 2. 2014
☒ 3. 2016
☐ 4. 2018

Question ID : 16794327910
Status : Answered
Chosen Option : 1

Q.2 With which of the following Indian dances does the Sankirtana form an important part?

- Ans ☐ 1. Mohiniyattam
☐ 2. Garba
☐ 3. Bharatnatyam

✓ 4. Manipuri

Question ID : 16794327908
Status : Answered
Chosen Option : 3

Q.2 Which of the following person is a Particle Physicist well known for work on Colliders?
3

- Ans
- ✗ 1. Uddab Bharali
 - ✓ 2. Rohini Godbole
 - ✗ 3. Baldev Dhillon
 - ✗ 4. Subhash Kak

Question ID : 16794327914
Status : Answered
Chosen Option : 2

Q.2 In which year was the Gandhi-Irwin Pact signed?
4

- Ans
- ✗ 1. 1920
 - ✗ 2. 1939
 - ✗ 3. 1942
 - ✓ 4. 1931

Question ID : 16794327911
Status : Answered
Chosen Option : 4

Q.2 Which of the following teams did India beat in the final match of ICC Cricket World Cup 2011?
5

- Ans
- ✗ 1. Australia
 - ✗ 2. Pakistan
 - ✗ 3. England
 - ✓ 4. Sri Lanka

Question ID : 16794327915
Status : Answered
Chosen Option : 4

Q.2 In February 2019, _____ assumed charge as the new Election Commissioner (EC) of India.
6

- Ans
- ✓ 1. Sushil Chandra
 - ✗ 2. Umesh Sinha
 - ✗ 3. Sandeep Saxena
 - ✗ 4. Sudeep Jain

Question ID : 16794327912
Status : Answered
Chosen Option : 2

Q.2
7 In April 2019, which of the following states observed the 75th anniversary of Battle of Kohima?

- Ans
- ☐ 1. Uttarakhand
 - ☐ 2. Sikkim
 - ☐ 3. Bihar
 - ☒ 4. Nagaland

Question ID : 16794327916
Status : Answered
Chosen Option : 4

Q.2
8 Which of the following is the state bird of Arunachal Pradesh?

- Ans
- ☐ 1. Peacock
 - ☐ 2. Black Necked Crane
 - ☒ 3. Great Hornbill
 - ☐ 4. Flycatcher

Question ID : 16794327917
Status : Answered
Chosen Option : 2

Q.2
9 According to IMF's World Economic Outlook (April 2019), India's projected growth rate in fiscal year 2019-20 will be _____.

- Ans
- ☐ 1. 5.3 percent
 - ☐ 2. 6.5 percent
 - ☐ 3. 8.2 percent
 - ☒ 4. 7.3 percent

Question ID : 16794327913
Status : Answered
Chosen Option : 4

Q.3
0 Which of the following landmass separates the state of Sikkim from Nepal?

- Ans
- ☐ 1. Rangit river
 - ☐ 2. Chola range
 - ☐ 3. Chumbi valley
 - ☒ 4. Singalila range

Question ID : 16794327909
Status : Answered
Chosen Option : 4