Graduate Aptitude Test in Engineering 2017

Question Paper Name: Mechanical Engineering 4th feb 2017 session 2
Subject Name: Mechanical Engineering
Duration: 180
Total Marks: 100

Organizing Institute:

Indian Institute of Technology Roorkee

Question Number : 1 **Correct : 1 Wrong : 0**

Two coins are tossed simultaneously. The probability (upto two decimal points accuracy) of getting at least one head is_____

Question Number : 2 **Correct : 1 Wrong : 0**

The divergence of the vector $-y\,\mathbf{i}+x\,\mathbf{j}$ is_____

Question Number : 3 **Correct : 1 Wrong : 0**

The determinant of a 2×2 matrix is 50. If one eigenvalue of the matrix is 10, the other eigenvalue is_____

Question Number : 4 **Correct : 1 Wrong : -0.33**

A sample of 15 data is as follows: 17, 18, 17, 17, 13, 18, 5, 5, 6, 7, 8, 9, 20, 17, 3. The mode of the data is

(A) 4 (B) 13 (C) 17 (D) 20

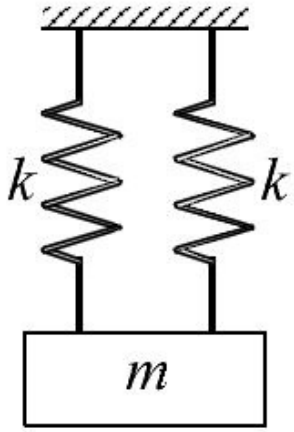
Question Number : 5 **Correct : 1 Wrong : -0.33**

The Laplace transform of te^{t} is

(A) $\frac{s}{(s+1)^2}$ (B) $\frac{1}{(s-1)^2}$ (C) $\frac{1}{(s+1)^2}$ (D) $\frac{s}{s-1}$

Question Number : 6 **Correct : 1 Wrong : -0.33**

A mass m is attached to two identical springs having spring constant k as shown in the figure. The natural frequency ω of this single degree of freedom system is



(A) $\sqrt{\frac{2k}{m}}$ (B) $\sqrt{\frac{k}{m}}$ (C) $\sqrt{\frac{k}{2m}}$ (D) $\sqrt{\frac{4k}{m}}$

Question Number : 7 **Correct : 1 Wrong : 0**

The state of stress at a point is $\sigma_x = \sigma_y = \sigma_z = \tau_{xz} = \tau_{zx} = \tau_{yz} = \tau_{zy} = 0$ and $\tau_{xy} = \tau_{yx} = 50$ MPa. The maximum normal stress (in MPa) at that point is_____

Question Number : 8 **Correct : 1 Wrong : 0**

For a loaded cantilever beam of uniform cross-section, the bending moment (in N·mm) along the length is $M(x) = 5x^2 + 10x$, where x is the distance (in mm) measured from the free end of the beam. The magnitude of shear force (in N) in the cross-section at $x = 10$ mm is_____

Question Number : 9 **Correct : 1 Wrong : -0.33**

A cantilever beam of length L and flexural modulus EI is subjected to a point load P at the free end. The elastic strain energy stored in the beam due to bending (neglecting transverse shear) is

(A) $\frac{P^2L^3}{6EI}$ (B) $\frac{P^2L^3}{3EI}$ (C) $\frac{PL^3}{3EI}$ (D) $\frac{PL^3}{6EI}$

Question Number : 10 **Correct : 1 Wrong : 0**

A steel bar is held by two fixed supports as shown in the figure and is subjected to an increase of temperature ΔT=100 °C. If the coefficient of thermal expansion and Young's modulus of elasticity of steel are 11×10^{-6} /°C and 200 GPa, respectively, the magnitude of thermal stress (in MPa) induced in the bar is _____

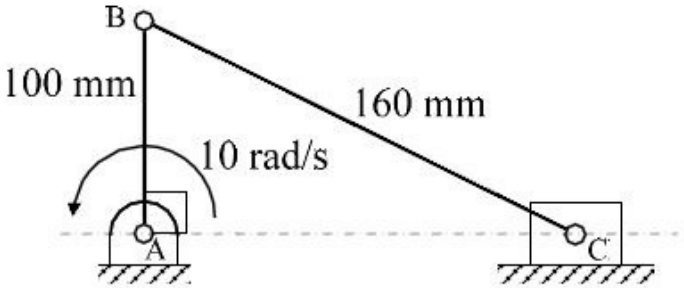


Question Number : 11 **Correct : 1 Wrong : 0**

A machine component made of a ductile material is subjected to a variable loading with $\sigma_{min} = -50$ MPa and $\sigma_{max} = 50$ MPa. If the corrected endurance limit and the yield strength for the material are $\sigma_e' = 100$ MPa and $\sigma_y = 300$ MPa, respectively, the factor of safety is_____

Question Number : 12 **Correct : 1 Wrong : 0**

In a slider-crank mechanism, the lengths of the crank and the connecting rod are 100 mm and 160 mm, respectively. The crank is rotating with an angular velocity of 10 radian/s counter-clockwise. The magnitude of linear velocity (in m/s) of the piston at the instant corresponding to the configuration shown in the figure is_____



Question Number : 13 **Correct : 1 Wrong : -0.33**

Which one of the following statements is **TRUE**?

(A) Both Pelton and Francis turbines are impulse turbines.
(B) Francis turbine is a reaction turbine but Kaplan turbine is an impulse turbine.
(C) Francis turbine is an axial-flow reaction turbine.
(D) Kaplan turbine is an axial-flow reaction turbine.

Question Number : 14 **Correct : 1 Wrong : -0.33**

A mass m of a perfect gas at pressure p_1 and volume V_1 undergoes an isothermal process. The final pressure is p_2 and volume is V_2. The work done on the system is considered positive. If R is the gas constant and T is the temperature, then the work done in the process is

(A) $p_1 V_1 \ln \frac{V_2}{V_1}$ (B) $-p_1 V_1 \ln \frac{p_1}{p_2}$ (C) $RT \ln \frac{V_2}{V_1}$ (D) $-mRT \ln \frac{p_2}{p_1}$

Question Number : 15 **Correct : 1 Wrong : -0.33**

If a mass of moist air contained in a closed metallic vessel is heated, then its

(A) relative humidity decreases
(B) relative humidity increases
(C) specific humidity increases
(D) specific humidity decreases

Question Number : 16 **Correct : 1 Wrong : -0.33**

For the stability of a floating body the

(A) centre of buoyancy must coincide with the centre of gravity
(B) centre of buoyancy must be above the centre of gravity
(C) centre of gravity must be above the centre of buoyancy
(D) metacentre must be above the centre of gravity

Question Number : 17 **Correct : 1 Wrong : -0.33**

Consider a laminar flow at zero incidence over a flat plate. The shear stress at the wall is denoted by τ_w. The axial positions x_1 and x_2 on the plate are measured from the leading edge in the direction of flow. If $x_2 > x_1$, then

(A) $\tau_w|_{x_1} = \tau_w|_{x_2} = 0$

(B) $\tau_w|_{x_1} = \tau_w|_{x_2} \neq 0$

(C) $\tau_w|_{x_1} > \tau_w|_{x_2}$

(D) $\tau_w|_{x_1} < \tau_w|_{x_2}$

Question Number : 18 **Correct : 1 Wrong : 0**

The heat loss from a fin is 6 W. The effectiveness and efficiency of the fin are 3 and 0.75, respectively. The heat loss (in W) from the fin, keeping the entire fin surface at base temperature, is_____

Question Number : 19 **Correct : 1 Wrong : -0.33**

The emissive power of a blackbody is P. If its absolute temperature is doubled, the emissive power becomes

(A) 2 P (B) 4 P (C) 8 P (D) 16 P

Question Number : 20 **Correct : 1 Wrong : -0.33**

Which one of the following statements is **TRUE** for the ultrasonic machining (USM) process?

(A) In USM, the tool vibrates at subsonic frequency.
(B) USM does not employ magnetostrictive transducer.
(C) USM is an excellent process for machining ductile materials.
(D) USM often uses a slurry comprising abrasive-particles and water.

Question Number : 21 **Correct : 1 Wrong : -0.33**

The crystal structure of aluminium is

(A) body-centred cubic

(B) face-centred cubic

(C) close-packed hexagonal

(D) body-centred tetragonal

Question Number : 22 **Correct : 1 Wrong : 0**

Given the atomic weight of Fe is 56 and that of C is 12, the weight percentage of carbon in cementite (Fe_3C) is_____

Question Number : 23 **Correct : 1 Wrong : -0.33**

For a single server with Poisson arrival and exponential service time, the arrival rate is 12 per hour. Which one of the following service rates will provide a steady state finite queue length?

(A) 6 per hour (B) 10 per hour (C) 12 per hour (D) 24 per hour

Question Number : 24 **Correct : 1 Wrong : 0**

The standard deviation of linear dimensions P and Q are 3 μm and 4 μm, respectively. When assembled, the standard deviation (in μm) of the resulting linear dimension (P+Q) is_____

Question Number : 25 **Correct : 1 Wrong : -0.33**

It is desired to make a product having T-shaped cross-section from a rectangular aluminium block. Which one of the following processes is expected to provide the highest strength of the product?

(A) Welding (B) Casting (C) Metal forming (D) Machining

Question Number : 26 **Correct : 2 Wrong : 0**

The surface integral $\iint_S \mathbf{F}\cdot\mathbf{n}\,dS$ over the surface S of the sphere $x^2+y^2+z^2=9$, where $\mathbf{F}=(x+y)\mathbf{i}+(x+z)\mathbf{j}+(y+z)\mathbf{k}$ and $\mathbf{n}$ is the unit outward surface normal, yields_____

Question Number : 27 **Correct : 2 Wrong : 0**

Consider the differential equation $3y''(x)+27y(x)=0$ with initial conditions $y(0) = 0$ and $y'(0) = 2000$. The value of y at $x = 1$ is_____

Question Number : 28 **Correct : 2 Wrong : 0**

Consider the matrix $\mathbf{A}=\begin{bmatrix}50 & 70\\ 70 & 80\end{bmatrix}$ whose eigenvectors corresponding to eigenvalues λ_1 and λ_2 are $\mathbf{x}_1=\begin{bmatrix}70\\ \lambda_1-50\end{bmatrix}$ and $\mathbf{x}_2=\begin{bmatrix}\lambda_2-80\\ 70\end{bmatrix}$, respectively. The value of $\mathbf{x}_1^T\mathbf{x}_2$ is_____

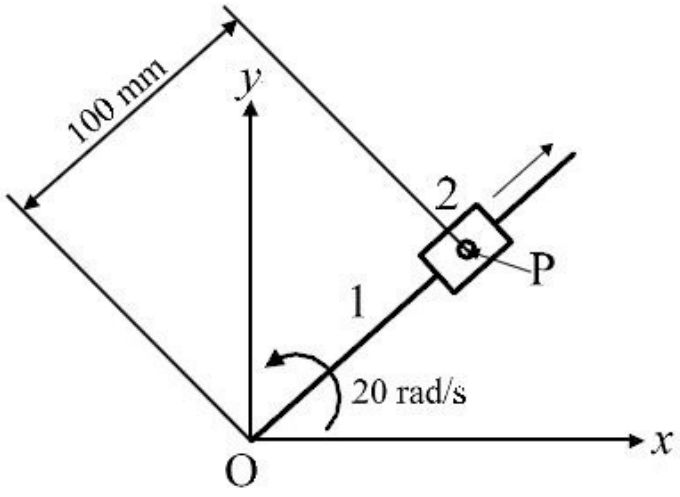
Question Number : 29 **Correct : 2 Wrong : -0.66**

If $f(z)=(x^2+ay^2)+ibxy$ is a complex analytic function of $z=x+iy$, where $i=\sqrt{-1}$, then

(A) $a=-1, b=-1$ (B) $a=-1, b=2$ (C) $a=1, b=2$ (D) $a=2, b=2$

Question Number : 30 **Correct : 2 Wrong : 0**

Block 2 slides outward on link 1 at a uniform velocity of 6 m/s as shown in the figure. Link 1 is rotating at a constant angular velocity of 20 radian/s counterclockwise. The magnitude of the total acceleration (in m/s^2) of point P of the block with respect to fixed point O is_____

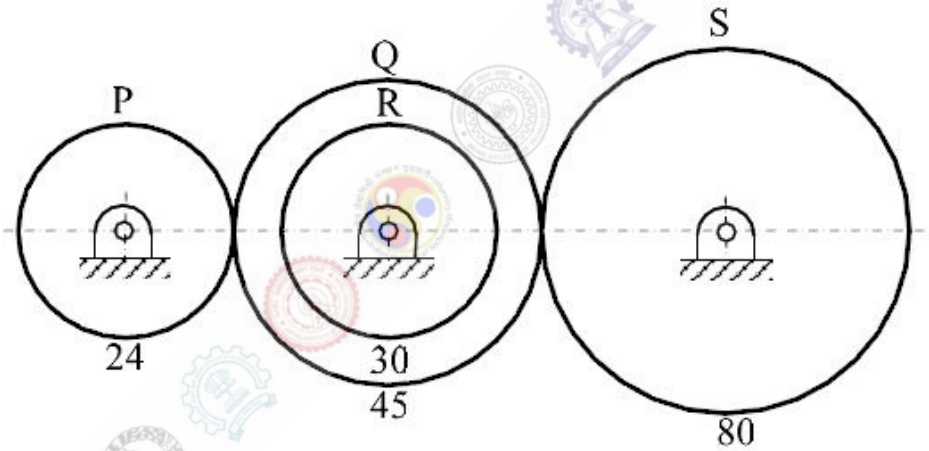


Question Number : 31 **Correct : 2 Wrong : 0**

The radius of gyration of a compound pendulum about the point of suspension is 100 mm. The distance between the point of suspension and the centre of mass is 250 mm. Considering the acceleration due to gravity as 9.81 m/s^2, the natural frequency (in radian/s) of the compound pendulum is_____

Question Number : 32 **Correct : 2 Wrong : 0**

A gear train shown in the figure consists of gears P, Q, R and S. Gear Q and gear R are mounted on the same shaft. All the gears are mounted on parallel shafts and the number of teeth of P, Q, R and S are 24, 45, 30 and 80, respectively. Gear P is rotating at 400 rpm. The speed (in rpm) of the gear S is_____

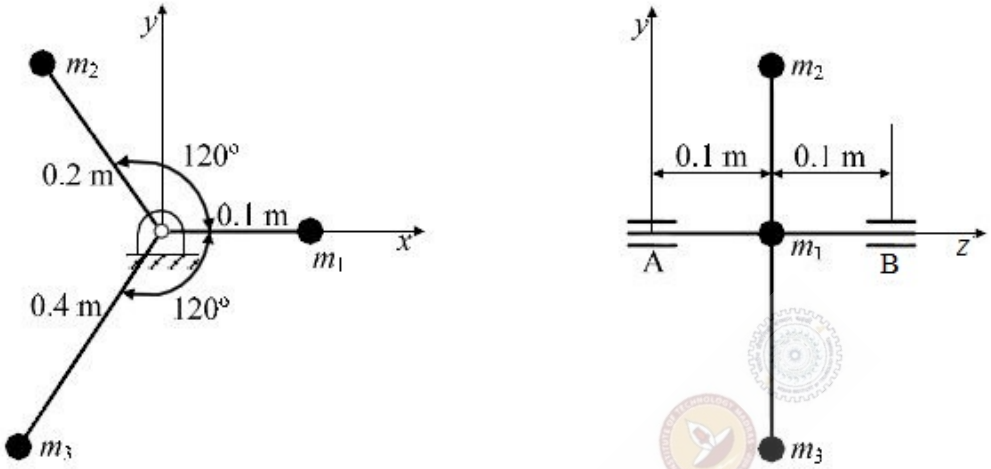


Question Number : 33 **Correct : 2 Wrong : 0**

A helical compression spring made of a wire of circular cross-section is subjected to a compressive load. The maximum shear stress induced in the cross-section of the wire is 24 MPa. For the same compressive load, if both the wire diameter and the mean coil diameter are doubled, the maximum shear stress (in MPa) induced in the cross-section of the wire is_____

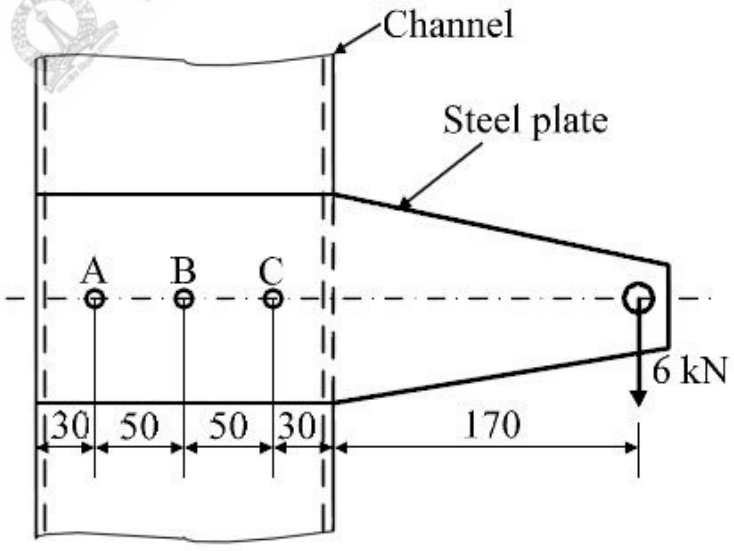
Question Number : 34 Correct : 2 Wrong : 0

Three masses are connected to a rotating shaft supported on bearings A and B as shown in the figure. The system is in a space where the gravitational effect is absent. Neglect the mass of shaft and rods connecting the masses. For m_1 = 10 kg, m_2 = 5 kg and m_3 = 2.5 kg and for a shaft angular speed of 1000 radian/s, the magnitude of the bearing reaction (in N) at location B is_____



Question Number : 35 Correct : 2 Wrong : -0.66

A steel plate, connected to a fixed channel using three identical bolts A, B and C, carries a load of 6 kN as shown in the figure. Considering the effect of direct load and moment, the magnitude of resultant shear force (in kN) on bolt C is



All dimensions are in mm.

(A) 13 (B) 15 (C) 17 (D) 30

Question Number : 36 **Correct : 2 Wrong : 0**

A single-plate clutch has a friction disc with inner and outer radii of 20 mm and 40 mm, respectively. The friction lining in the disc is made in such a way that the coefficient of friction μ varies radially as $\mu = 0.01r$, where r is in mm. The clutch needs to transmit a friction torque of 18.85 kN·mm. As per uniform pressure theory, the pressure (in MPa) on the disc is_____

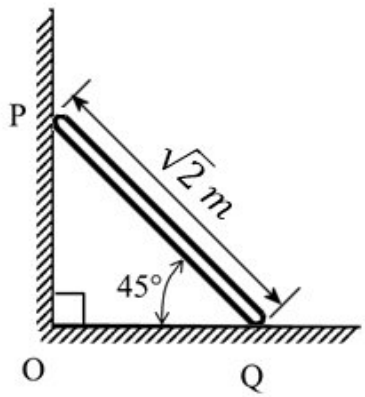
Question Number : 37 **Correct : 2 Wrong : -0.66**

The principal stresses at a point in a critical section of a machine component are $\sigma_1 = 60$ MPa, $\sigma_2 = 5$ MPa and $\sigma_3 = -40$ MPa. For the material of the component, the tensile yield strength is $\sigma_y = 200$ MPa. According to the maximum shear stress theory, the factor of safety is

(A) 1.67 (B) 2.00 (C) 3.60 (D) 4.00

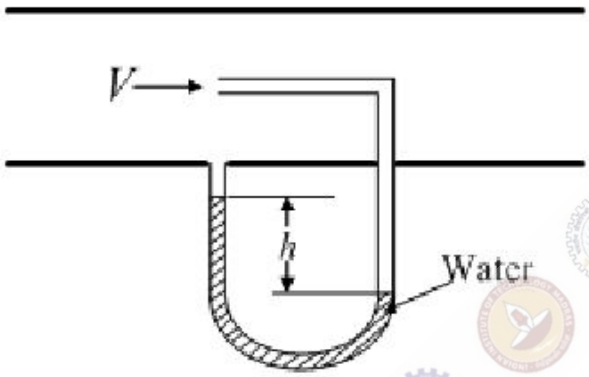
Question Number : 38 **Correct : 2 Wrong : 0**

The rod PQ of length $L = \sqrt{2}$ m, and uniformly distributed mass of $M = 10$ kg, is released from rest at the position shown in the figure. The ends slide along the frictionless faces OP and OQ. Assume acceleration due to gravity, g = 10 m/s^2. The mass moment of inertia of the rod about its centre of mass and an axis perpendicular to the plane of the figure is $(ML^2/12)$. At this instant, the magnitude of angular acceleration (in radian/s^2) of the rod is _____



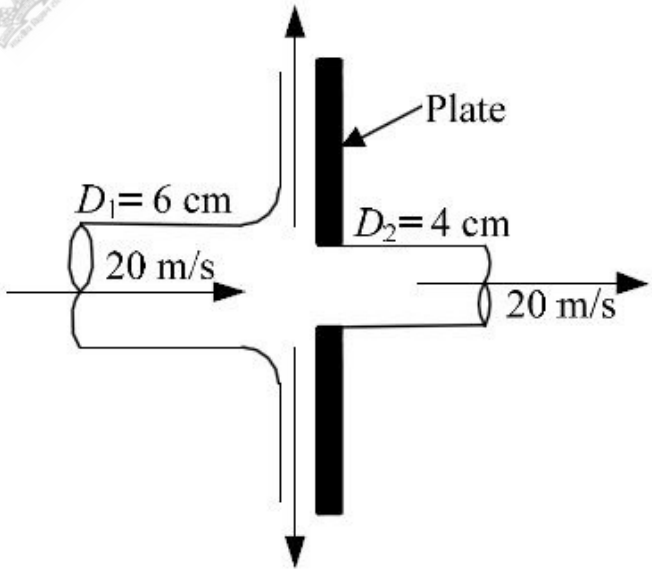
Question Number : 39 **Correct : 2 Wrong : 0**

The arrangement shown in the figure measures the velocity V of a gas of density 1 kg/m^3 flowing through a pipe. The acceleration due to gravity is 9.81 m/s^2. If the manometric fluid is water (density 1000 kg/m^3) and the velocity V is 20 m/s, the differential head h (in mm) between the two arms of the manometer is_____



Question Number : 40 **Correct : 2 Wrong : 0**

A 60 mm-diameter water jet strikes a plate containing a hole of 40 mm diameter as shown in the figure. Part of the jet passes through the hole horizontally, and the remaining is deflected vertically. The density of water is 1000 kg/m^3. If velocities are as indicated in the figure, the magnitude of horizontal force (in N) required to hold the plate is_____



Question Number : 41 **Correct : 2 Wrong : 0**

For the laminar flow of water over a sphere, the drag coefficient C_F is defined as $C_F = F/\left(\rho U^2 D^2\right)$, where F is the drag force, ρ is the fluid density, U is the fluid velocity and D is the diameter of the sphere. The density of water is 1000 kg/m^3. When the diameter of the sphere is 100 mm and the fluid velocity is 2 m/s, the drag coefficient is 0.5. If water now flows over another sphere of diameter 200 mm under dynamically similar conditions, the drag force (in N) on this sphere is_____

Question Number : 42 **Correct : 2 Wrong : 0**

In the Rankine cycle for a steam power plant the turbine entry and exit enthalpies are 2803 kJ/kg and 1800 kJ/kg, respectively. The enthalpies of water at pump entry and exit are 121 kJ/kg and 124 kJ/kg, respectively. The specific steam consumption (in kg/kW.h) of the cycle is_____

Question Number : 43 **Correct : 2 Wrong : -0.66**

A calorically perfect gas (specific heat at constant pressure 1000 J/kg·K) enters and leaves a gas turbine with the same velocity. The temperatures of the gas at turbine entry and exit are 1100 K and 400 K, respectively. The power produced is 4.6 MW and heat escapes at the rate of 300 kJ/s through the turbine casing. The mass flow rate of the gas (in kg/s) through the turbine is

(A) 6.14 (B) 7.00 (C) 7.50 (D) 8.00

Question Number : 44 **Correct : 2 Wrong : 0**

One kg of an ideal gas (gas constant R = 287 J/kg·K) undergoes an irreversible process from state-1 (1 bar, 300 K) to state-2 (2 bar, 300 K). The change in specific entropy $(s_2 - s_1)$ of the gas (in J/kg·K) in the process is_____

Question Number : 45 **Correct : 2 Wrong : -0.66**

The volume and temperature of air (assumed to be an ideal gas) in a closed vessel is 2.87 m^3 and 300 K, respectively. The gauge pressure indicated by a manometer fitted to the wall of the vessel is 0.5 bar. If the gas constant of air is R = 287 J/kg·K and the atmospheric pressure is 1 bar, the mass of air (in kg) in the vessel is

(A) 1.67 (B) 3.33 (C) 5.00 (D) 6.66

Question Number : 46 **Correct : 2 Wrong : -0.66**

In a counter-flow heat exchanger, water is heated at the rate of 1.5 kg/s from 40 °C to 80 °C by an oil entering at 120 °C and leaving at 60 °C. The specific heats of water and oil are 4.2 kJ/kg·K and 2 kJ/kg·K, respectively. The overall heat transfer coefficient is 400 $W/m^2·K$. The required heat transfer surface area (in m^2) is

(A) 0.104 (B) 0.022 (C) 10.4 (D) 21.84

Question Number : 47 **Correct : 2 Wrong : -0.66**

A metal ball of diameter 60 mm is initially at 220 °C. The ball is suddenly cooled by an air jet of 20 °C. The heat transfer coefficient is 200 $W/m^2·K$. The specific heat, thermal conductivity and density of the metal ball are 400 J/kg·K, 400 W/m·K and 9000 kg/m^3, respectively. The ball temperature (in °C) after 90 seconds will be approximately

(A) 141 (B) 163 (C) 189 (D) 210

Question Number : 48 **Correct : 2 Wrong : -0.66**

A product made in two factories, P and Q, is transported to two destinations, R and S. The per unit costs of transportation (in Rupees) from factories to destinations are as per the following matrix:

Factory \ Destination	R	S
P	10	7
Q	3	4

Factory P produces 7 units and factory Q produces 9 units of the product. Each destination requires 8 units. If the north-west corner method provides the total transportation cost as X (in Rupees) and the optimized (the minimum) total transportation cost is Y (in Rupees), then (X–Y), in Rupees, is

(A) 0 (B) 15 (C) 35 (D) 105

Question Number : 49 **Correct : 2 Wrong : 0**

A project starts with activity A and ends with activity F. The precedence relation and durations of the activities are as per the following table:

Activity	Immediate predecessor	Duration (days)
A	–	4
B	A	3
C	A	7
D	B	14
E	C	4
F	D, E	9

The minimum project completion time (in days) is_____

Question Number : 50 **Correct : 2 Wrong : -0.66**

A rod of length 20 mm is stretched to make a rod of length 40 mm. Subsequently, it is compressed to make a rod of final length 10 mm. Consider the longitudinal tensile strain as positive and compressive strain as negative. The total true longitudinal strain in the rod is

(A) –0.5 (B) –0.69 (C) –0.75 (D) –1.0

Question Number : 51 **Correct : 2 Wrong : 0**

Maximize $Z = 5x_1 + 3x_2$,
subject to
$x_1 + 2x_2 \leq 10$,
$x_1 - x_2 \leq 8$,
$x_1, x_2 \geq 0$.
In the starting Simplex tableau, x_1 and x_2 are non-basic variables and the value of Z is zero. The value of Z in the next Simplex tableau is_____

Question Number : 52 **Correct : 2 Wrong : 0**

A strip of 120 mm width and 8 mm thickness is rolled between two 300 mm-diameter rolls to get a strip of 120 mm width and 7.2 mm thickness. The speed of the strip at the exit is 30 m/min. There is no front or back tension. Assuming uniform roll pressure of 200 MPa in the roll bite and 100% mechanical efficiency, the minimum total power (in kW) required to drive the two rolls is_____

Question Number : 53 **Correct : 2 Wrong : 0**

A cylindrical pin of $25^{+0.020}_{+0.010}$ mm diameter is electroplated. Plating thickness is $2.0^{\pm 0.005}$ mm. Neglecting the gauge tolerance, the diameter (in mm, up to 3 decimal points accuracy) of the GO ring gauge to inspect the plated pin is _____

Question Number : 54 **Correct : 2 Wrong : -0.66**

During the turning of a 20 mm-diameter steel bar at a spindle speed of 400 rpm, a tool life of 20 minute is obtained. When the same bar is turned at 200 rpm, the tool life becomes 60 minute. Assume that Taylor's tool life equation is valid. When the bar is turned at 300 rpm, the tool life (in minute) is approximately

(A) 25 (B) 32 (C) 40 (D) 50

Question Number : 55 **Correct : 2 Wrong : 0**

In an orthogonal machining with a tool of 9° orthogonal rake angle, the uncut chip thickness is 0.2 mm. The chip thickness fluctuates between 0.25 mm and 0.4 mm. The ratio of the maximum shear angle to the minimum shear angle during machining is_____

Question Number : 56 **Correct : 1 Wrong : -0.33**

The ways in which this game can be played _____ potentially infinite.

(A) is (B) is being (C) are (D) are being

Question Number : 57 **Correct : 1 Wrong : -0.33**

If you choose plan P, you will have to _____ plan Q, as these two are mutually_____.

(A) forgo, exclusive
(B) forget, inclusive
(C) accept, exhaustive
(D) adopt, intrusive

Question Number : 58 **Correct : 1 Wrong : -0.33**

If a and b are integers and $a - b$ is even, which of the following must always be even?

(A) ab (B) $a^2 + b^2 + 1$ (C) $a^2 + b + 1$ (D) $ab - b$

Question Number : 59 **Correct : 1 Wrong : -0.33**

A couple has 2 children. The probability that both children are boys if the older one is a boy is

(A) 1/4 (B) 1/3 (C) 1/2 (D) 1

Question Number : 60 **Correct : 1 Wrong : -0.33**

P looks at Q while Q looks at R. P is married, R is not. The number of pairs of people in which a married person is looking at an unmarried person is

(A) 0 (B) 1 (C) 2 (D) Cannot be determined

Question Number : 61 **Correct : 2 Wrong : -0.66**

"If you are looking for a history of India, or for an account of the rise and fall of the British Raj, or for the reason of the cleaving of the subcontinent into two mutually antagonistic parts and the effects this mutilation will have in the respective sections, and ultimately on Asia, you will not find it in these pages; for though I have spent a lifetime in the country, I lived too near the seat of events, and was too intimately associated with the actors, to get the perspective needed for the impartial recording of these matters."

Which of the following is closest in meaning to 'cleaving'?

(A) deteriorating (B) arguing (C) departing (D) splitting

Question Number : 62 **Correct : 2 Wrong : -0.66**

X bullocks and Y tractors take 8 days to plough a field. If we halve the number of bullocks and double the number of tractors, it takes 5 days to plough the same field. How many days will it take X bullocks alone to plough the field?

(A) 30 (B) 35 (C) 40 (D) 45

Question Number : 63 **Correct : 2 Wrong : -0.66**

There are 4 women P, Q, R, S, and 5 men V, W, X, Y, Z in a group. We are required to form pairs each consisting of one woman and one man. P is not to be paired with Z, and Y must necessarily be paired with someone. In how many ways can 4 such pairs be formed?

(A) 74 (B) 76 (C) 78 (D) 80

Question Number : 64 **Correct : 2 Wrong : -0.66**

All people in a certain island are either 'Knights' or 'Knaves' and each person knows every other person's identity. Knights NEVER lie, and knaves ALWAYS lie.

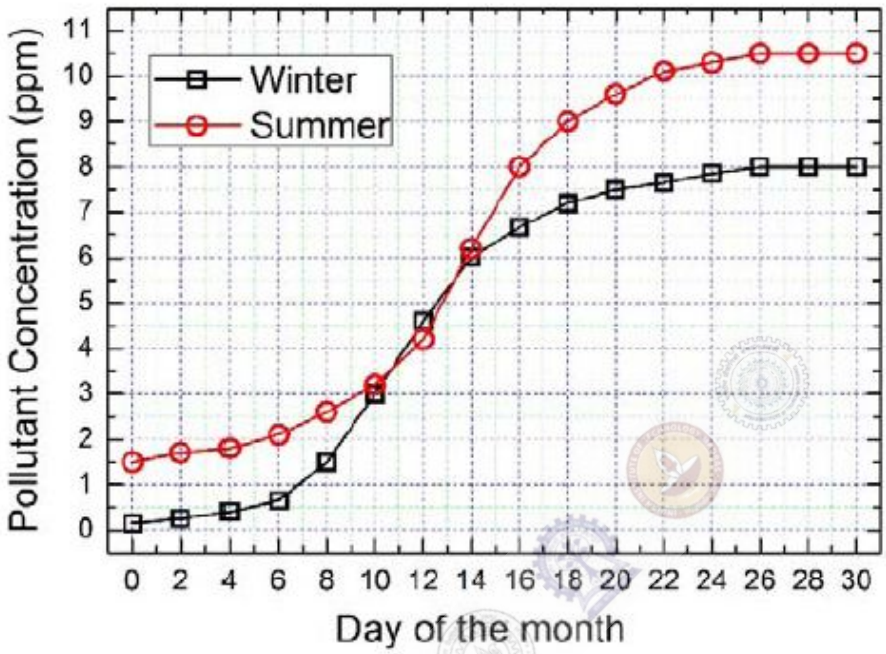
P says "Both of us are knights". Q says "None of us are knaves".

Which one of the following can be logically inferred from the above?

(A) Both P and Q are knights
(B) P is a knight; Q is a knave
(C) Both P and Q are knaves
(D) The identities of P, Q cannot be determined

Question Number : 65 **Correct : 2 Wrong : -0.66**

In the graph below, the concentration of a particular pollutant in a lake is plotted over (alternate) days of a month in winter (average temperature 10 °C) and a month in summer (average temperature 30 °C).



Consider the following statements based on the data shown above:

i. Over the given months, the difference between the maximum and the minimum pollutant concentrations is the same in both winter and summer.

ii. There are at least four days in the summer month such that the pollutant concentrations on those days are within 1 ppm of the pollutant concentrations on the corresponding days in the winter month.

Which one of the following options is correct?

(A) Only i (B) Only ii (C) Both i and ii (D) Neither i nor ii

Q. No.	Type	Section	Key	Marks
1	NAT	ME-2	0.75 to 0.75	1
2	NAT	ME-2	0 to 0	1
3	NAT	ME-2	5 to 5	1
4	MCQ	ME-2	C	1
5	MCQ	ME-2	B	1
6	MCQ	ME-2	A	1
7	NAT	ME-2	49.9 to 50.1	1
8	NAT	ME-2	110 to 110	1
9	MCQ	ME-2	A	1
10	NAT	ME-2	218 to 222	1
11	NAT	ME-2	1.99 to 2.01	1
12	NAT	ME-2	0.99 to 1.01	1
13	MCQ	ME-2	D	1
14	MCQ	ME-2	B	1
15	MCQ	ME-2	A	1
16	MCQ	ME-2	D	1
17	MCQ	ME-2	C	1
18	NAT	ME-2	7.9 to 8.1	1
19	MCQ	ME-2	D	1
20	MCQ	ME-2	D	1
21	MCQ	ME-2	B	1
22	NAT	ME-2	6.3 to 7.0	1
23	MCQ	ME-2	D	1
24	NAT	ME-2	5 to 5	1
25	MCQ	ME-2	C	1
26	NAT	ME-2	225 to 227	2
27	NAT	ME-2	93 to 95	2
28	NAT	ME-2	0 to 0	2
29	MCQ	ME-2	B	2
30	NAT	ME-2	243 to 244	2
31	NAT	ME-2	15 to 16	2
32	NAT	ME-2	119 to 121	2
33	NAT	ME-2	6 to 6	2
34	NAT	ME-2	0 to 0	2
35	MCQ	ME-2	C	2
36	NAT	ME-2	0.49 to 0.51	2

37	MCQ	ME-2	B	2
38	NAT	ME-2	7.25 to 7.75	2
39	NAT	ME-2	19 to 21	2
40	NAT	ME-2	627 to 629	2
41	NAT	ME-2	19.9 to 20.1	2
42	NAT	ME-2	3.5 to 3.7	2
43	MCQ	ME-2	B	2
44	NAT	ME-2	-201 to -197	2
45	MCQ	ME-2	C	2
46	MCQ	ME-2	D	2
47	MCQ	ME-2	A	2
48	MCQ	ME-2	Mark to all	2
49	NAT	ME-2	30 to 30	2
50	MCQ	ME-2	B	2
51	NAT	ME-2	40 to 40	2
52	NAT	ME-2	8.5 to 10.0	2
53	NAT	ME-2	29.03 - 29.03	2
54	MCQ	ME-2	B	2
55	NAT	ME-2	1.45 to 1.53	2
56	MCQ	GA	C	1
57	MCQ	GA	A	1
58	MCQ	GA	D	1
59	MCQ	GA	C	1
60	MCQ	GA	B	1
61	MCQ	GA	D	2
62	MCQ	GA	A	2
63	MCQ	GA	C	2
64	MCQ	GA	D	2
65	MCQ	GA	B	2