Graduate Aptitude Test in Engineering 2017

Question Paper Name: Metallurgical Engineering 5th Feb 2017
Subject Name: Metallurgical Engineering
Duration: 180
Total Marks: 100

Organizing Institute:

Indian Institute of Technology Roorkee

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

For the matrix, $A = \begin{bmatrix} 1 & 1 & 2 \\ 2 & 1 & 1 \\ 1 & 1 & 2 \end{bmatrix}$, AA^T is

(A) $\begin{bmatrix} 6 & 5 & 6 \\ 5 & 6 & 6 \\ 6 & 5 & 6 \end{bmatrix}$

(B) $\begin{bmatrix} 6 & 5 & 6 \\ 5 & 6 & 6 \\ 5 & 5 & 6 \end{bmatrix}$

(C) $\begin{bmatrix} 6 & 5 & 6 \\ 5 & 6 & 5 \\ 6 & 6 & 6 \end{bmatrix}$

(D) $\begin{bmatrix} 6 & 5 & 6 \\ 5 & 6 & 5 \\ 6 & 5 & 6 \end{bmatrix}$

Question Number : 2 **Correct : 1 Wrong : -0.33**

The mean of a numerical data-set is $\bar{X}$ and the standard deviation is S. If a number K is added to each term in the data-set then the mean and standard deviation become:

(A) $\bar{X},\ S$

(B) $\bar{X} + K,\ S$

(C) $\bar{X},\ S + K$

(D) $\bar{X} + K,\ S + K$

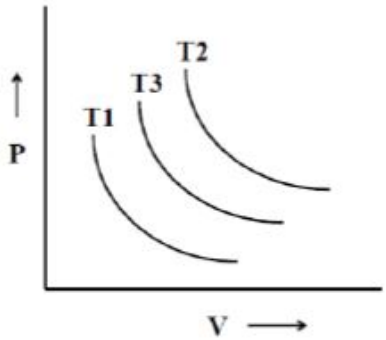
Question Number : 3 **Correct : 1 Wrong : -0.33**

If $f(x) = e^{|x|}$ then at $x = 0$, the function $f(x)$ is

(A) continuous and differentiable.
(B) continuous but not differentiable.
(C) neither continuous nor differentiable.
(D) not continuous but differentiable.

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

The pressure (P) versus volume (V) diagram given below represents reversible isothermal curves at temperatures, T1, T2 and T3.



Considering one mole of ideal gas for all the three isothermal processes, which one of the following is TRUE?

(A) T1 > T2 > T3 (B) T2 > T3 > T1 (C) T3 > T1 > T2 (D) T2 < T1 < T3

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

For the electrochemical reaction, $Cu^{2+} + Zn = Zn^{2+} + Cu$, the standard cell potential at 25°C and 1 atm pressure is:

(Given: $E°\ (Cu^{2+}/Cu) = 0.337$ V and $E°\ (Zn^{2+}/Zn) = -0.763$ V)

(A) –0.426 V (B) 0.426 V (C) 0.55 V (D) 1.1 V

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

The rate of dissolution of Al particles in liquid steel is proportional to concentration difference (ΔC). ΔC is defined by:

(Given: (i) C_b = bulk concentration of dissolved Al in liquid steel, (ii) C^* = saturation concentration of Al in liquid steel at the given temperature, (iii) C_m = Density of Al/Atomic weight of Al.)

(A) $C^* - C_b$ (B) $C_b - C_m$ (C) $C^* - C_m$ (D) $\sqrt{C^* C_m} - C_b$

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

Hydrogen dissolves in Pd by the reaction $H_2 = 2$ [H]. At 300°C and $P_{H_2} = 1$ atm, the solubility of hydrogen in Pd is 1.64×10^4 mm^3 (STP) per kg of Pd. At 300°C and $P_{H_2} = 0.09$ atm, the solubility of hydrogen in Pd in mm^3 (STP) per kg of Pd is _____ *(answer up to one decimal place)*

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

The sieve analysis of ground quartz particles is given in the table below:

Sieve size (mm)	Mass fraction of ground product retained on each sieve
4.76	0.0
3.36	0.2
2.38	0.4
1.68	0.3
1.19	0.08
< 1.19	0.02

The cumulative mass fraction of particles of size less than 1.68 mm is _____ *(answer up to two decimal places)*

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

The sequence of precipitation to reach stable equilibrium during ageing of Al-4.5 wt.% Cu alloy is:

(A) GP zone $\rightarrow \theta' \rightarrow \theta'' \rightarrow \theta$
(B) GP zone $\rightarrow \theta'' \rightarrow \theta' \rightarrow \theta$
(C) GP zone $\rightarrow \theta \rightarrow \theta'' \rightarrow \theta'$
(D) GP zone $\rightarrow \theta'' \rightarrow \theta \rightarrow \theta'$

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

Tungsten powder is pressed at 150 MPa to a green density of 55%. After sintering, the compact attains 86.5% of its theoretical density. Assuming uniform shrinkage, the linear shrinkage (in %) is _____ *(answer up to two decimal places)*

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

For a FCC metal, radius of the largest sphere that can fit in the tetrahedral void (in nm) is _____ *(answer up to three decimal places)*

(Given: lattice parameter = 0.401 nm)

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

In an iron-carbon alloy containing 0.35 wt.% C, the mass fraction of pearlite just below the eutectoid temperature is _____ *(answer up to two decimal places)*

(Given: eutectoid composition = 0.8 wt.% carbon; and carbon content in ferrite is 0.025 wt.%)

Question Number : 13 **Correct : 1 Wrong : 0**

A cubic metal has a density of 19000 $kg.m^{-3}$, lattice parameter of 0.4 nm and atomic weight of 183. The effective number of atoms in an unit cell of this metal is _____

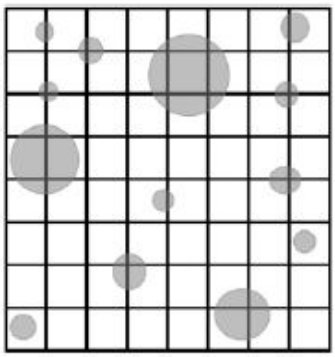
Question Number : 14 **Correct : 1 Wrong : -0.33**

Primary mechanisms of accommodating plastic strain at low temperatures in crystalline metals are:

(A) twinning and dislocation-slip
(B) dislocation-climb and dislocation-slip
(C) dislocation-slip and diffusion
(D) viscous-flow and dislocation-slip

Question Number : 15 **Correct : 1 Wrong : 0**

Spherical α phase particles are depicted in the hypothetical microstructure section shown below. Using the superimposed grid on the microstructure, the estimated volume fraction of α phase is _____ *(answer up to three decimal places)*



Question Number : 16 **Correct : 1 Wrong : 0**

A brittle material (Young's modulus = 60 GPa and surface energy = 0.5 $J.m^{-2}$) has a surface crack of length 2 μm. The fracture strength (in MPa) of this material is _____ *(answer up to two decimal places)*

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

Both creep resistance and tensile strength of a metal can be enhanced by

(A) increase in the grain size
(B) decrease in the grain size
(C) addition of dispersoids
(D) annealing

Question Number : 18 **Correct : 1 Wrong : -0.33**

Stress required to operate a Frank-Read source of length L is approximately given by:

(A) $\frac{Gb}{L}$ (B) $\frac{Gb^2}{L}$

(C) $\frac{Gb^2}{L^2}$ (D) $\frac{Gb^2}{2L^2}$

Question Number : 19 **Correct : 1 Wrong : 0**

The second peak in the powder X-ray diffraction pattern of a FCC metal occurs at a Bragg angle θ (in degrees) = _____ *(answer up to two decimal places)*

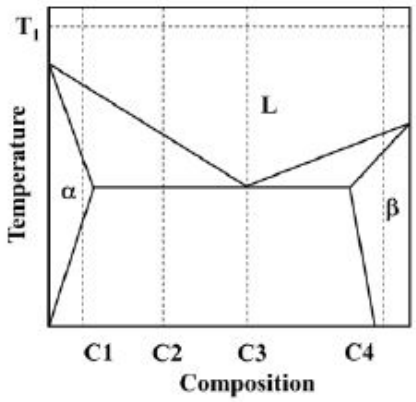
(Given: $\lambda_{CuK\alpha}$ = 0.154 nm; lattice parameter of the metal = 0.36 nm)

Question Number : 20 **Correct : 1 Wrong : 0**

A rod is elastically deformed by a uniaxial stress resulting in a strain of 0.02. If the Poisson's ratio is 0.3, the volumetric strain is _____ *(answer up to three decimal places)*

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

Four alloys, C1, C2, C3, C4, shown in the phase diagram are poured at temperature T_1 in a mold. During solidification, which one of these alloys is expected to have the highest fluidity?



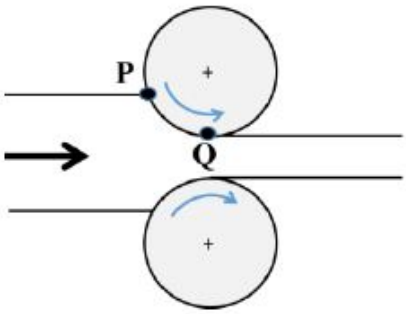
(A) C1 (B) C2 (C) C3 (D) C4

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

A material, which shows power law behavior, $\bar{\sigma} = 50\bar{\varepsilon}^{0.3}$, is being wire drawn. The maximum strain per pass in annealed condition (assume ideal work and efficiency $\eta = 1$) is _____
(answer up to two decimal places)

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

Schematic diagram shows rolling of a slab. P and Q are points on the surface of the workpiece near entrance and exit, respectively. With reference to the work piece, which one of the following statements is TRUE?



(A) Frictional force is along rolling direction at both P and Q.
(B) Frictional force is opposite to rolling direction at both P and Q.
(C) Frictional force is along rolling direction at P and opposite to rolling direction at Q.
(D) Frictional force is opposite to rolling direction at P and along rolling direction at Q.

Question Number : 24 **Correct : 1 Wrong : -0.33**

Which one of the following manufacturing techniques is used for making window glass?

(A) Investment casting
(B) Patenting
(C) Spray forming
(D) Float-bath method

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

Dye penetrant test is based on the principle of

(A) polarized sound waves in liquid.
(B) magnetic domain.
(C) absorption of X-rays.
(D) capillary action.

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

Assume that the probability of South Africa winning against India is 1/3. If South Africa plays a 3 match cricket series against India, the probability that South Africa wins only one match is *(assume that no matches are tied or abandoned)*_____ *(answer up to three decimal places)*

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

The function $f(x) = x^3 - 3x$ has a minimum at $x =$_____

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

The definite integral, $\int_0^1 e^{-x^2}\,dx$ is to be evaluated numerically. Divide the integration interval into exactly 2 subintervals of equal length. Applying the trapezoidal rule, the approximate value of the integral is _____ *(answer up to two decimal places)*

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

For the second order linear ordinary differential equation,
$\frac{d^2y}{dx^2} + p\frac{dy}{dx} + qy = 0$,
the following function is a solution:
$y = e^{\lambda x}$
Which one of the following statements is NOT TRUE?

(A) λ has two values: one complex and one real
(B) $\lambda^2 + p\lambda + q = 0$
(C) λ has two real values
(D) λ has two complex values

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

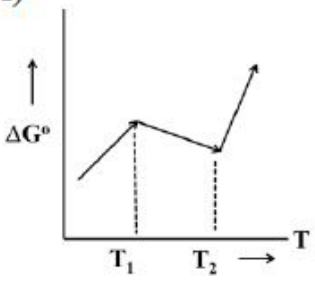
Using the bisection method, the root of the equation $x^3 + x - 1 = 0$ after *three* iterations is _____
(answer up to two decimal places)

(Assume starting values of x = –1 and +1)

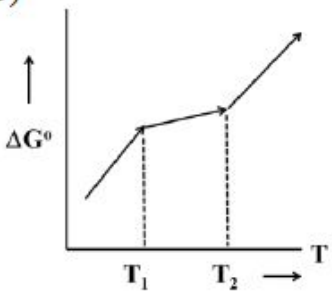
Question Number : 31 Correct : 2 Wrong : -0.66

T_1 and T_2 are the melting points of pure metal A and pure stoichiometric oxide AO_2, respectively, and $T_1 < T_2$. The stoichiometric metal oxidation reaction $A(s) + O_2(g) = AO_2(s)$ is in equilibrium at 1 atm pressure at temperature less than T_1. If the temperature increases, which schematic represents the correct standard free energy change versus temperature plot?

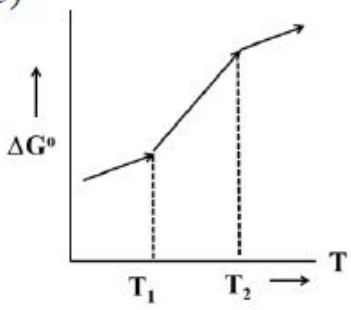
(A)



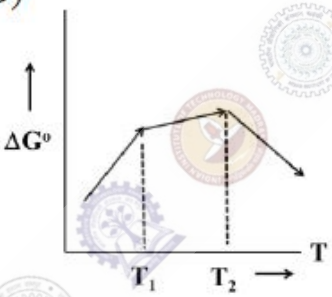
(B)



(C)



(D)



Question Number : 32 Correct : 2 Wrong : 0

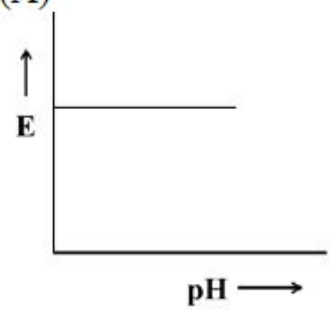
A continuous cast steel slab, 1 m × 1 m × 0.1 m, at 1298 K cools in air. The initial rate of heat loss (in kW) from the top surface of slab by radiation and convection is _____ *(answer up to two decimal places)*

Given: (i) Ambient temperature = 298 K, (ii) emissivity of steel = 0.8, (iii) convective heat transfer coefficient = 4.6 $W.m^{-2}.K^{-1}$, (iv) Stefan-Boltzmann constant (σ) = 5.7×10^{-8} $W.m^{-2}.K^{-4}$

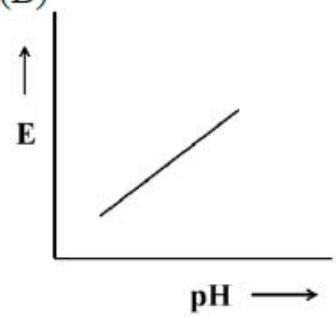
Question Number : 33 Correct : 2 Wrong : -0.66

The Pourbaix plot of the reaction $Al^{3+} + 2H_2O = AlO_2^- + 4H^+$ in potential (E) versus pH diagram is:

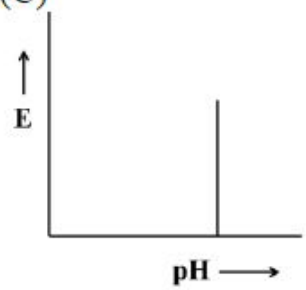
(A)



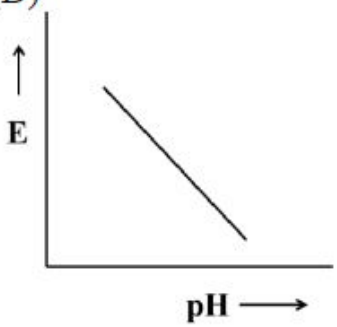
(B)



(C)



(D)



Question Number : 34 **Correct : 2 Wrong : 0**

During the end blow period in LD steelmaking, the de-carburization rate is expressed by the equation: $\frac{dC}{dt} = -(c - c^*)$. Here, c and c^* are the instantaneous and equilibrium concentration of carbon in steel respectively, in units of wt.%. Given that $c^* = 0.04$ wt.% and c (t = 0 min) = 0.4 wt.%, the concentration of carbon in steel (in wt.%) at t = 1 min is _____ *(answer up to three decimal places)*

Question Number : 35 **Correct : 2 Wrong : 0**

$CaCO_3(s)$ dissociates in a closed system according to the reaction:
$CaCO_3(s) = CaO(s) + CO_2(g)$
Assuming the reaction is in thermodynamic equilibrium, the degree(s) of freedom, F = _____

Question Number : 36 **Correct : 2 Wrong : -0.66**

A ladle containing molten steel is being discharged. The relevant forces are listed in ***Column I***. Match them with their corresponding expressions in ***Column II***.

Column I	***Column II***
[P] Pressure force	[1] μUL
[Q] Inertial force	[2] ρgL^3
[R] Gravity force	[3] ρU^2L^2
[S] Viscous force	[4] PL^2

μ = viscosity, U = characteristic velocity, L = characteristic length,
g = acceleration due to gravity, P = pressure.

(A) P-4; Q-3; R-2;S-1 (B) P-1; Q-3; R-2;S-4 (C) P-2; Q-3; R-4;S-1 (D) P-4; Q-3; R-1;S-2

Question Number : 37 **Correct : 2 Wrong : 0**

In primary steelmaking, dissolved oxygen (*O*) reacts with carbon (*C*) to produce *CO (g)*, at 1 atm pressure according to the reaction: ***C*** + ***O*** = ***CO (g)***. The equilibrium constant for this reaction is: $logK = \frac{1160}{T} + 2.003$, where *T* is in *Kelvin*. Assuming Henrian activity coefficient of both *O* and *C* to be unity, the dissolved oxygen content (in wt.%) of a plain carbon steel melt with 0.7 wt.% C at 1600°C is_____ *(answer up to four decimal places)*

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

A stoichiometric mixture of CO and pure oxygen at 1 atm and 25°C flows into a combustion reactor. The molar flow rate of CO entering the reactor is 1 kg-mol.h^{-1}. The adiabatic flame temperature (in K) for the combustion of CO with stoichiometric oxygen is:_____
(answer up to two decimal places)

Given: $\Delta H^{o}_{298}(CO \rightarrow CO_2) = -282000$ *kJ.(kg-mol CO)*$^{-1}$, $C_p\,(CO_2) = 44$ *kJ.(kg-mol K)*$^{-1}$.

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

A solution contains 10^{-3} M of Fe^{3+} at 25°C. The solubility product of $Fe(OH)_3$ is 10^{-39}. Assuming activity equals concentration, the minimum pH at which Fe^{3+} will precipitate as $Fe(OH)_3$ is _____
(answer up to two decimal places)

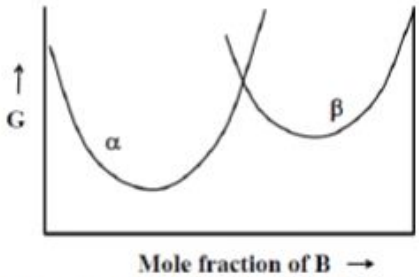
Question Number : 40 **Correct : 2 Wrong : 0**

A zinc electrowinning cell is being operated at a current of 400 A, voltage of 3.5 V, and a cathodic current efficiency of 90%. The specific energy consumption (in kJ.kg^{-1} zinc) is _____
(answer up to two decimal places)

(Atomic weight of Zn = 65)

Question Number : 41 Correct : 2 Wrong : -0.66

Pure metals A and B form two real binary solid solutions α and β at temperature T and pressure P. The free energy versus composition plots for both the solutions are shown below.



The condition for chemical equilibrium is:

(A) Mole fraction of A in α = mole fraction of A in β and mole fraction of B in α = mole fraction of B in β
(B) Mole fraction of B in α = mole fraction of A in β and mole fraction of A in α = mole fraction of B in β
(C) Activity of A in α = activity of A in β and activity of B in α = activity of B in β
(D) Activity of A in α = activity of B in β and activity of B in α = activity of A in β

Question Number : 42 Correct : 2 Wrong : 0

Pure orthorhombic sulfur transforms to stable monoclinic sulfur above 368.5 K. Applying Third law of thermodynamics, the value of entropy (in $J.K^{-1}$) of transformation at 368.5 K is _____ *(answer up to two decimal places)*

Given:
i. Entropy change associated with heating orthorhombic sulfur from 0 K to 368.5 K is 36.86 J. K^{-1}.
ii. Entropy change associated with cooling monoclinic sulfur from 368.5 K to 0 K is –37.8 $J.K^{-1}$.

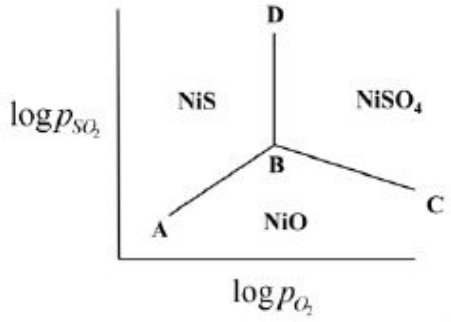
Question Number : 43 Correct : 2 Wrong : 0

For homogeneous nucleation of solid in a liquid of a pure metal, the critical edge length (in nm) of a cube shaped nucleus is _____ *(answer up to two decimal places)*

(Given: surface energy $\gamma = 0.177\ J.m^{-2}$; change in volume free energy $\Delta G_V = -2.8\times10^{8}\ J.m^{-3}$)

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

Assuming the solid phases to be pure, the slope of line BC in the predominance area diagram schematically shown below is _____ *(answer up to two decimal places)*



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

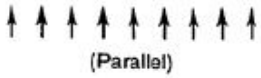
For each of the crystallographic system listed in *Group-I*, match the corresponding minimum symmetry in *Group-II*

Group-I	***Group-II***
[P] Tetragonal	[1] 1 *two-fold* rotation
[Q] Cubic	[2] 1 *three-fold* rotation
[R] Monoclinic	[3] 4 *three-fold* rotation
[S] Rhombohedral	[4] 1 *four-fold* rotation

(A) P-3; Q-4; R-2; S-3
(B) P-4; Q-3; R-2; S-1
(C) P-1; Q-2; R-4; S-3
(D) P-4; Q-3; R-1; S-2

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

Arrange the magnetic moment of neighboring atoms in a one-dimensional lattice in *Group-I* to the corresponding magnetic material in *Group-II*

	Group-I	***Group-II***
[P]	 (Random)	[1] Antiferromagnetic
[Q]	 (Parallel)	[2] Ferrimagnetic
[R]	 (Antiparallel)	[3] Paramagnetic
[S]	 Antiparallel and unequal	[4] Ferromagnetic

(A) P-4; Q-1; R-3; S-2
(B) P-3; Q-4; R-1; S-2
(C) P-2; Q-4; R-1; S-3
(D) P-1; Q-2; R-3; S-4

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

For an intrinsic semiconductor, the room temperature electrical conductivity is $10^{-6}\ \Omega^{-1}.m^{-1}$. If the electron and hole mobilities are 0.75 and 0.06 $m^2V^{-1}s^{-1}$ respectively, the intrinsic carrier concentration (per m^3) at room temperature is:

(A) 5.1×10^{12} (B) 7.7×10^{12} (C) 8.3×10^{12} (D) 1.1×10^{14}

Question Number : 48 **Correct : 2 Wrong : 0**

A steel component is subjected to fatigue loading: σ (maximum) = 200 MPa, σ (minimum) = 0. The component has an initial crack length of 1 mm. Propagation of crack is governed by

$$\frac{da}{dN} = 10^{-12}(\Delta K)^3,$$

where, the crack length a is in meters, N is the number of cycles and ΔK is in $MPa.m^{1/2}$. The length of the crack (in m) after one million cycles will be _____ *(answer up to three decimal places)*

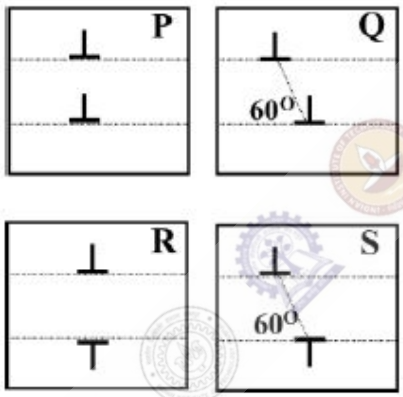
Question Number : 49 **Correct : 2 Wrong : 0**

During heat treatment of a cold worked metal, recrystallization is 20% complete after 100 s. The transformation (in %) in 400 s is _____ *(answer up to two decimal places)*

(Assume Avrami exponent, n =2)

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

At low temperature, two parallel edge dislocations lying on parallel slip planes are shown in different configurations below.



Match the following:

Configuration [P]	[1] Dislocations repel
Configuration [Q]	[2] Dislocations attract
Configuration [R]	[3] Dislocations are in stable equilibrium
Configuration [S]	[4] Dislocations are in unstable equilibrium

(A) P-3, Q-2, R-4, S-1
(B) P-4, Q-1, R-3, S-2
(C) P-1, Q-3, Q-2, R-4
(D) P-2, Q-4, R-1, S-3

Question Number : 51 **Correct : 2 Wrong : -0.66**

A single crystal of an FCC metal is subjected to a sufficiently large tensile stress along the [110] direction to activate some of the slip systems. Which one of the following slip systems will be activated:

(A) $\frac{a}{2}[\bar{1}10](111)$
(B) $\frac{a}{2}[011](11\bar{1})$
(C) $\frac{a}{2}[011](1\bar{1}1)$
(D) $\frac{a}{2}[110](\bar{1}1\bar{1})$

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

A perfectly elastic-plastic material has a yield stress of 450 MPa and fractures at a strain of 0.45. The ratio of resilience to toughness for this material is _____ *(answer up to three decimal places)*

(Given the Young's modulus E = 4.5 GPa)

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

Total time for solidification of a cubic casting of dimensions 5.0 cm × 5.0 cm × 5.0 cm is 1.6 min. A cylindrical riser with diameter to height ratio 0.5 is required so that the time for solidification of riser is 3.2 min. Applying Chvorinov's rule, the height of the riser (in cm) is _____ *(answer up to two decimal places)*

(Assume that exponent (n) in Chvorinov's equation is 2)

Question Number : 54 **Correct : 2 Wrong : 0**

A 250 mm thick slab of a nickel alloy is subjected to cold rolling using a roll of diameter 450 mm. If the angle of bite during rolling is 10°, the maximum possible reduction (in mm) during rolling is _____ *(answer up to two decimal places)*

Question Number : 55 **Correct : 2 Wrong : -0.66**

W-Ni compact is prepared by liquid phase sintering at 1500°C. If the size of tungsten grains is 40 μm and the interfacial tungsten-tungsten and tungsten-nickel energies are 0.52 and 0.30 $J.m^{-2}$ respectively, the predicted average neck size (in μm) of sintered tungsten grain is:

(Melting points of tungsten and nickel are 3410°C and 1453°C, respectively)

(A) 10 (B) 15 (C) 20 (D) 25

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

The ninth and the tenth of this month are Monday and Tuesday _____.

(A) figuratively (B) retrospectively (C) respectively (D) rightfully

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

It is _____ to read this year's textbook _____the last year's.

(A) easier, than (B) most easy, than (C) easier, from (D) easiest, from

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

A rule states that in order to drink beer, one must be over 18 years old. In a bar, there are 4 people. P is 16 years old, Q is 25 years old, R is drinking milkshake and S is drinking a beer. What must be checked to ensure that the rule is being followed?

(A) Only P's drink
(B) Only P's drink and S's age
(C) Only S's age
(D) Only P's drink, Q's drink and S's age

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

Fatima starts from point P, goes North for 3 km, and then East for 4 km to reach point Q. She then turns to face point P and goes 15 km in that direction. She then goes North for 6 km. How far is she from point P, and in which direction should she go to reach point P?

(A) 8 km, East (B) 12 km, North (C) 6 km, East (D) 10 km, North

Question Number : 60 Correct : 1 Wrong : -0.33

500 students are taking one or more courses out of Chemistry, Physics, and Mathematics. Registration records indicate course enrolment as follows: Chemistry (329), Physics (186), Mathematics (295), Chemistry and Physics (83), Chemistry and Mathematics (217), and Physics and Mathematics (63). How many students are taking all 3 subjects?

(A) 37 (B) 43 (C) 47 (D) 53

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 statements best reflects the author's opinion?

(A) An intimate association does not allow for the necessary perspective.
(B) Matters are recorded with an impartial perspective.
(C) An intimate association offers an impartial perspective.
(D) Actors are typically associated with the impartial recording of matters.

Question Number : 62 Correct : 2 Wrong : -0.66

Each of P, Q, R, S, W, X, Y and Z has been married at most once. X and Y are married and have two children P and Q. Z is the grandfather of the daughter S of P. Further, Z and W are married and are parents of R. Which one of the following must necessarily be FALSE?

(A) X is the mother-in-law of R
(B) P and R are not married to each other
(C) P is a son of X and Y
(D) Q cannot be married to R

Question Number : 63 Correct : 2 Wrong : -0.66

1200 men and 500 women can build a bridge in 2 weeks. 900 men and 250 women will take 3 weeks to build the same bridge. How many men will be needed to build the bridge in one week?

(A) 3000 (B) 3300 (C) 3600 (D) 3900

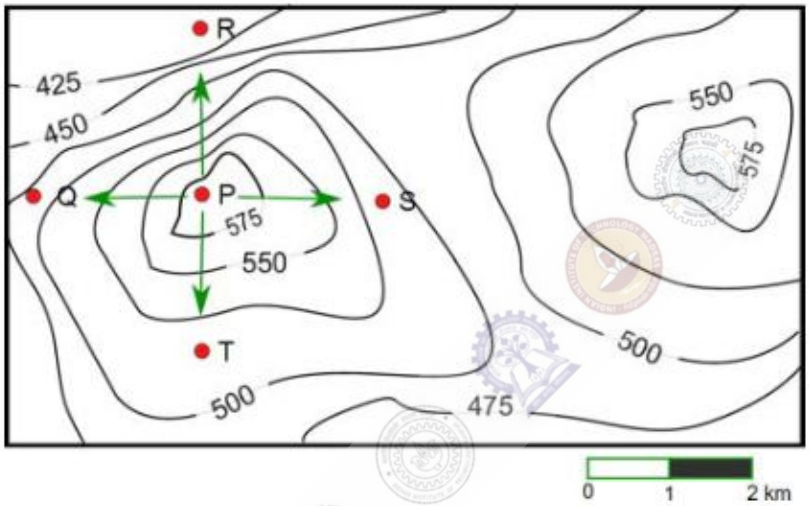
Question Number : 64 **Correct : 2 Wrong : 0.66**

The number of 3-digit numbers such that the digit 1 is never to the immediate right of 2 is

(A) 781 (B) 791 (C) 881 (D) 891

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

A contour line joins locations having the same height above the mean sea level. The following is a contour plot of a geographical region. Contour lines are shown at 25 m intervals in this plot.



Which of the following is the steepest path leaving from P?

(A) P to Q (B) P to R (C) P to S (D) P to T