Graduate Aptitude Test in Engineering 2017

Question Paper Name: Production and Industrial Engineering 5th Feb 2017
Subject Name: Production and Industrial Engineering
Duration: 180
Total Marks: 100

Organizing Institute:

Indian Institute of Technology Roorkee

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

Divergence of the curl of a twice differentiable continuous vector function is

(A) unity (B) infinity (C) zero (D) a unit vector

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

For two non-zero vectors $\bar{A}$ and $\bar{B}$, if $\bar{A}+\bar{B}$ is perpendicular to $\bar{A}-\bar{B}$, then

(A) the magnitude of $\bar{A}$ is twice the magnitude of $\bar{B}$
(B) the magnitude of $\bar{A}$ is half the magnitude of $\bar{B}$
(C) $\bar{A}$ and $\bar{B}$ cannot be orthogonal
(D) the magnitudes of $\bar{A}$ and $\bar{B}$ are equal

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

For an orthogonal matrix Q, the valid equality is

(A) $Q^T = Q^{-1}$ (B) $Q = Q^{-1}$ (C) $Q^T = Q$ (D) $\det(Q) = 0$

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

The product of a complex number $z = x + iy$ and its complex conjugate $\bar{z}$ is

(A) x^2 (B) y^2 (C) $x^2 - y^2$ (D) $x^2 + y^2$

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

Using Simpson's 1/3 rule for numerical integration, the consecutive points are joined by a

(A) line (B) parabola
(C) polynomial with power 3 (D) polynomial with power 1/3

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

For a two dimensional state-of-stress defined as $\sigma_{xx} = \sigma_{yy} = \tau_{xy} = S$, the Mohr's circle of stress has

(A) center at $(S, 0)$ and radius S

(B) center at $(0,0)$ and radius S

(C) center at $(S, 0)$ and radius 0

(D) center at $(S/2, 0)$ and radius $2S$

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

A specimen of steel has yield strength of 700 MPa. The specimen is subjected to a state of plane-stress with $\sigma_1 = \sigma_2 = 500$ MPa. The factor of safety according to the von-Mises theory of failure is_____

Question Number : 8 **Correct : 1 Wrong : -0.33**

The inside and outside radii of a thick-walled cylindrical pressure vessel are denoted by a and b, respectively. If the vessel is subjected to an internal pressure P, then the magnitude of the radial stress σ_{rr} is

(A) zero at $r = a$ and maximum at $r = b$
(B) maximum at $r = a$ and zero at $r = b$
(C) constant over the entire thickness
(D) zero at both $r = a$ and $r = b$

Question Number : 9 **Correct : 1 Wrong : 0**

A metallic cylindrical casing of an exhaust pipe has inner radius 50 mm and wall thickness 7 mm. If the thermal conductivity of the material of the casing is 50 W/m-K, then the thermal resistance of the casing in K/kW is _____ (up to *three* decimal places).

Question Number : 10 **Correct : 1 Wrong : -0.33**

In Value Engineering approach, the value of the product is

(A) inversely proportional to its functions and directly proportional to its cost
(B) directly proportional to its functions and inversely proportional to its cost
(C) inversely proportional to its functions as well as its cost
(D) directly proportional to its functions as well as its cost

Question Number : 11 **Correct : 1 Wrong : -0.33**

Match the ASME process chart symbols with their correct description

	Symbols		Description
P.	O	1.	STORAGE
Q.	⇒	2.	TRANSPORTATION
R.	□	3.	OPERATION
S.	▽	4.	DELAY
T.	D	5.	INSPECTION

(A) P-3, Q-4, R-1, S-5, T-2

(B) P-4, Q-2, R-5, S-1, T-3

(C) P-3, Q-2, R-5, S-1, T-4

(D) P-1, Q-5, R-3, S-2, T-4

Question Number : 12 **Correct : 1 Wrong : -0.33**

In Glass Fiber Reinforced Plastic (GFRP) composites with long fibers, the role of matrix is to

(P) support and transfer the stresses to the fibers
(Q) reduce propagation of cracks
(R) carry the entire load
(S) protect the fibers against damage

The correct statements are

(A) P, Q and R (B) Q, R and S (C) P, Q and S (D) P, R and S

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

Turning, drilling, boring and milling are commonly used machining operations. Among these, the operation(s) performed by a single point cutting tool is(are)

(A) turning only

(B) drilling and milling only

(C) turning and boring only

(D) boring only

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

In chemical machining, the etch factor is expressed as

(A) $\frac{\text{undercut}}{\text{depth of cut}}$

(B) $\frac{\text{depth of cut}}{\text{undercut}}$

(C) $\frac{\text{workpiece wear}}{\text{tool wear}}$

(D) $\frac{\text{tool wear}}{\text{workpiece wear}}$

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

A Shewhart $\overline{X}$-chart was developed for an in-control process. Considering the probability of a point falling outside the 3σ control limits as 0.0026, the value of average run length for this chart is_____

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

Accuracy of a measuring instrument is expressed as

(A) true value – measured value

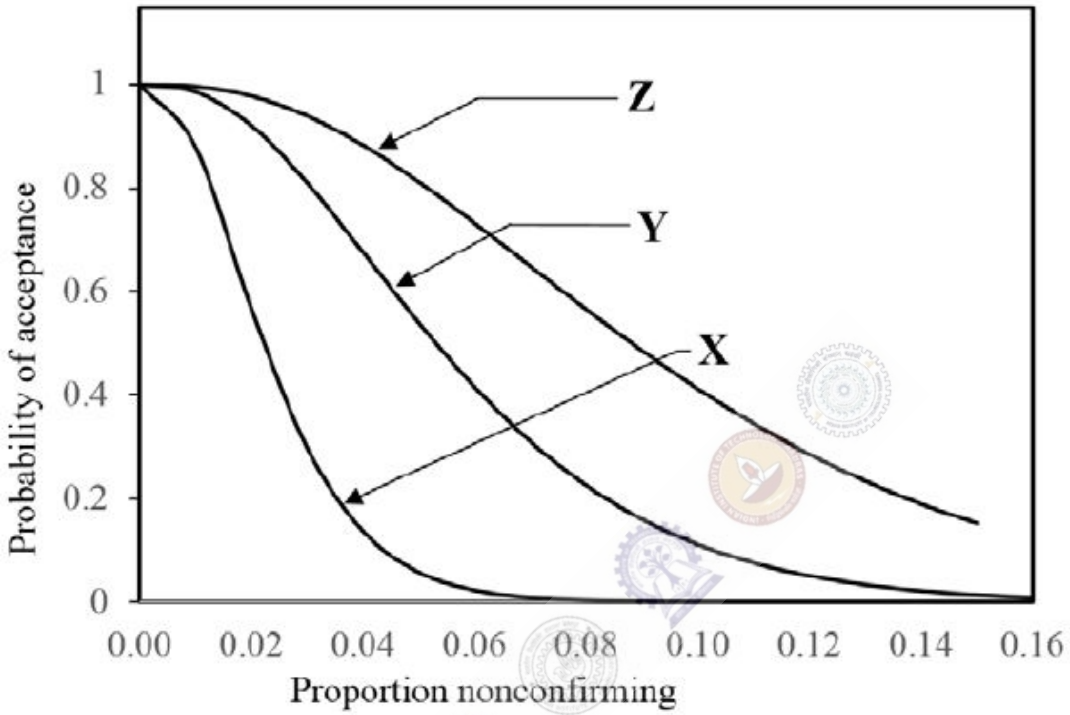
(B) measured value – true value

(C) $1-\left|\frac{\text{true value} - \text{measured value}}{\text{true value}}\right|$

(D) $1+\left|\frac{\text{true value} - \text{measured value}}{\text{true value}}\right|$

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

The operating characteristic curves of three single sampling plans X, Y and Z with same lot size and acceptance number are shown in the Figure.



Considering the above operating characteristic curves, the correct relationship of the plans with respect to sample size is

(A) sample size of X < sample size of Y < sample size of Z
(B) sample size of X = sample size of Y = sample size of Z
(C) sample size of X > sample size of Y > sample size of Z
(D) sample size of X > sample size of Y < sample size of Z

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

In carbon dioxide molding process, the binder used is

(A) Sodium bentonite
(B) Calcium bentonite
(C) Sodium silicate
(D) Phenol formaldehyde

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

A steel wire of 2 mm diameter is to be drawn from a wire of 5 mm diameter. The value of true strain developed is _____ (up to *three* decimal places).

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

In gas tungsten arc welding process, the material coated on pure tungsten electrode to enhance its current carrying capacity is

(A) Titanium (B) Manganese (C) Radium (D) Thorium

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

In powder metallurgy, the process 'atomization' refers to a method of

(A) producing powders

(B) compaction of powders

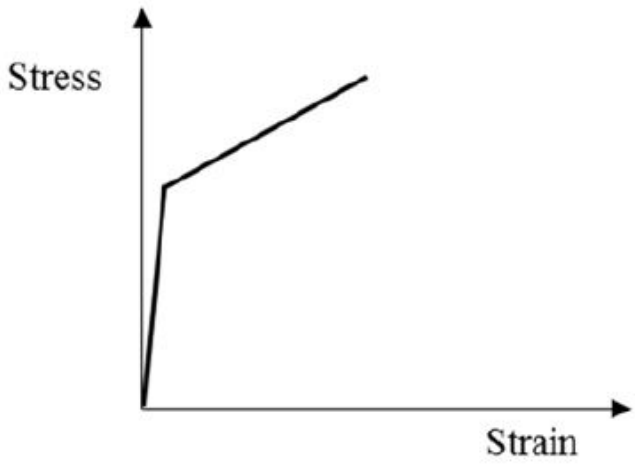
(C) sintering of powder compacts

(D) blending of metal powders

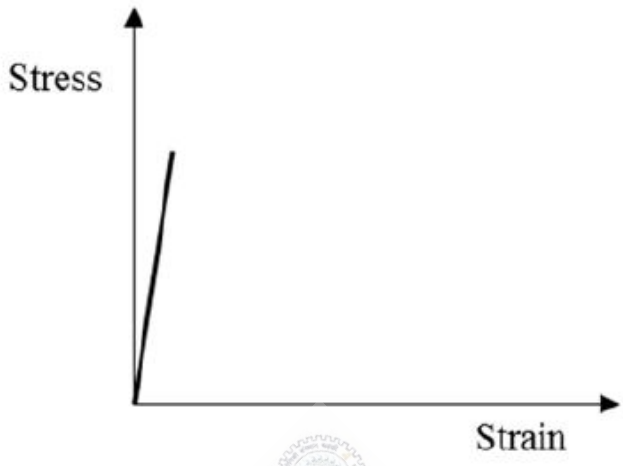
Question Number : 22 **Correct : 1 Wrong : -0.33**

The ideal stress-strain behavior for a completely brittle material during tensile testing up to failure is described by

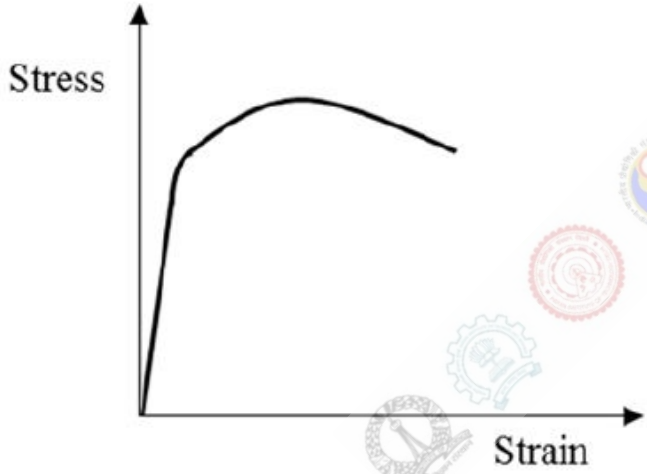
(A)



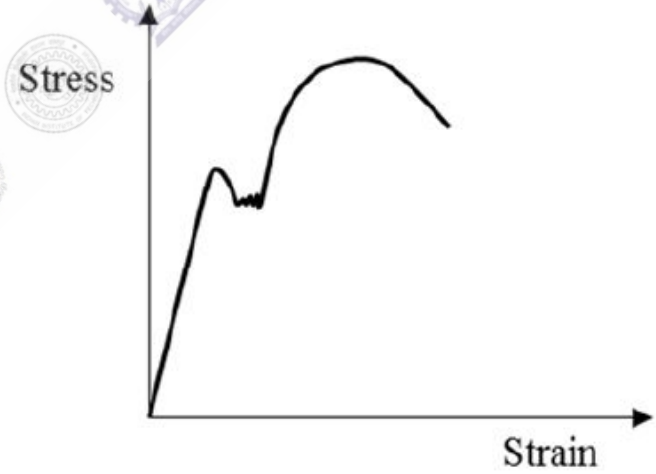
(B)



(C)



(D)



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

With reference to Iron-Carbon equilibrium phase diagram, the crystal structure of 0.3% plain carbon steel at 1,100 °C is

(A) HCP (B) BCT (C) BCC (D) FCC

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

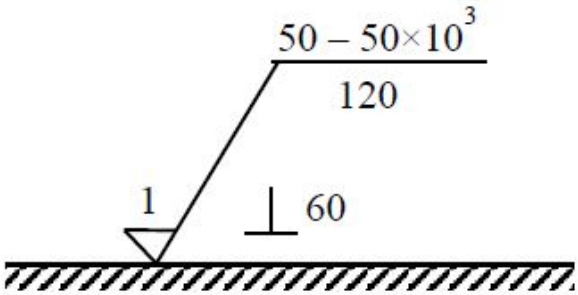
If E is the modulus of elasticity in GPa, G is the shear modulus in GPa and ν is the Poisson's ratio of a linear elastic and isotropic material, the three terms are related as

(A) $E = G(1 - 2\nu)$ (B) $E = 2G(1 - \nu)$

(C) $E = G(1 + 2\nu)$ (D) $E = 2G(1 + \nu)$

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

A machined surface with standard symbols indicating the surface texture is shown in the Figure. (All dimensions in the Figure are in micrometer).



The waviness height (in micrometer) of the surface is

(A) 1 (B) 50 (C) 60 (D) 120

Question Number : 26 **Correct : 2 Wrong : -0.66**

The improper integral $\int_0^\infty e^{-2t}dt$ converges to

(A) 0 (B) 1.0 (C) 0.5 (D) 2.0

Question Number : 27 **Correct : 2 Wrong : -0.66**

The local minima of the function $f(x) = x^2 - x^4$ in the range $-0.8 \le x \le 0.8$ is located at

(A) $x = 0$ (B) $x = \frac{1}{\sqrt{2}}$ (C) $x = -\frac{1}{\sqrt{2}}$ (D) $x = \frac{1}{2}$

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

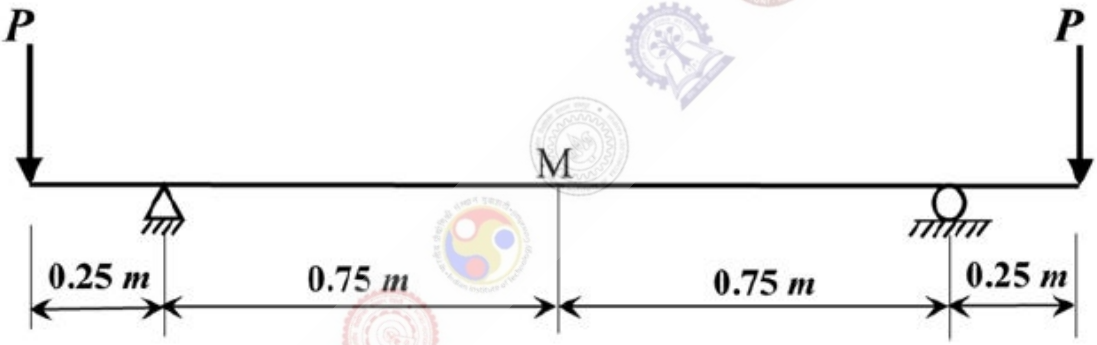
Runge-Kutta fourth order method is used to solve the differential equation $\frac{dy}{dx} = y - x$. If the initial value $y(0) = 2$ and step-size is 0.1, then the value of $y(0.1)$ is _____ (up to *three* decimal places).

Question Number : 29 **Correct : 2 Wrong : 0**

Two machines are defective in a lot of 10. A combination of four machines is to be picked at a time from the lot. The maximum number of combinations that can be obtained without any defective machine is _____

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

The simply-supported beam shown in the Figure is loaded symmetrically using two equal point loads *P*. The radius of curvature of the deflection-curve is 15 m for the portion of the beam that is subjected to pure bending. The vertical deflection (in mm) at point M, equidistant from both the supports, is_____ (up to *two* decimal places).



Question Number : 31 **Correct : 2 Wrong : -0.66**

A solid circular shaft is subjected to a bending moment *M* and torque *T* simultaneously. Neglecting the effects of stress concentration, the equivalent bending moment is expressed as

(A) $\frac{1}{2}\left(M+\sqrt{M^2+T^2}\right)$

(B) $\left(\frac{M}{2}+\sqrt{M^2+T^2}\right)$

(C) $\frac{1}{2}\left(M+\sqrt{M^2+4T^2}\right)$

(D) $\left(\frac{M}{2}+\sqrt{M^2+4T^2}\right)$

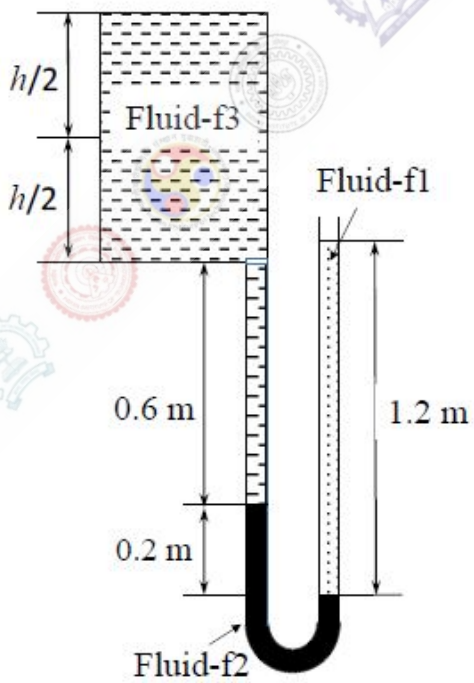
Question Number : 32 Correct : 2 Wrong : -0.66

A pair of spur gears with 20° full-depth involute teeth is used to transmit 3.5 kW of power. The pinion rotates at 700 rpm and has pitch circle diameter of 100 mm. Assuming a single pair of teeth in contact, the total force acting on a gear tooth (in kN) is

(A) 0.347 (B) 0.954 (C) 1.016 (D) 1.302

Question Number : 33 Correct : 2 Wrong : 0

A manometer is used for the pressure measurement in a closed tank. The three fluids f1, f2 and f3 have specific weights γ, 2γ and 0.5γ, respectively. The schematic arrangement with manometric readings and other dimensions are shown in the Figure. In order to ensure zero gauge pressure in the tank at the mid-height level ($h/2$), the height of the tank h (in m) is _____

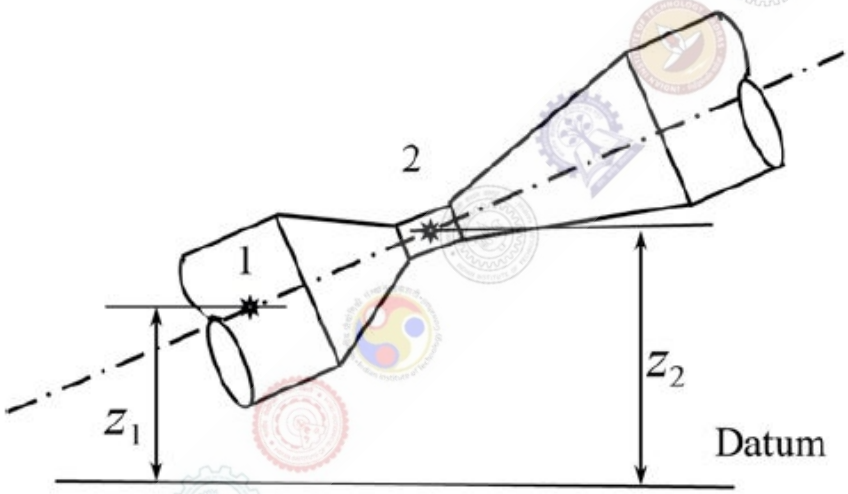


Question Number : 34 **Correct : 2 Wrong : 0**

A pipeline with variable cross-section contains water with specific weight 10^4 N/m^3. The flow conditions at two points 1 and 2 on the axis of the pipe are:

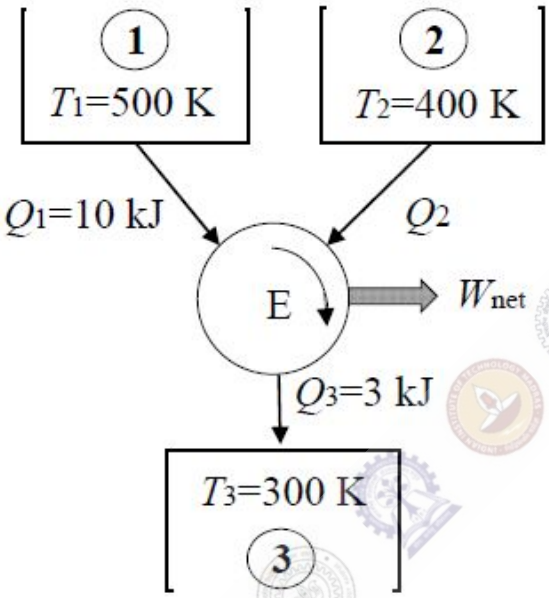
$$P_1 = 3 \text{ bar}, \qquad V_1 = 10 \text{ m/s}$$
$$P_2 = 1 \text{ bar}, \qquad V_2 = 20 \text{ m/s}$$

Consider frictional losses to be negligible. For no-flow condition between points 1 and 2 (as shown in Figure), if the height z_1 from the datum is 1 m, then the height z_2 (in m) is _____
($g = 9.81$ m/s^2)



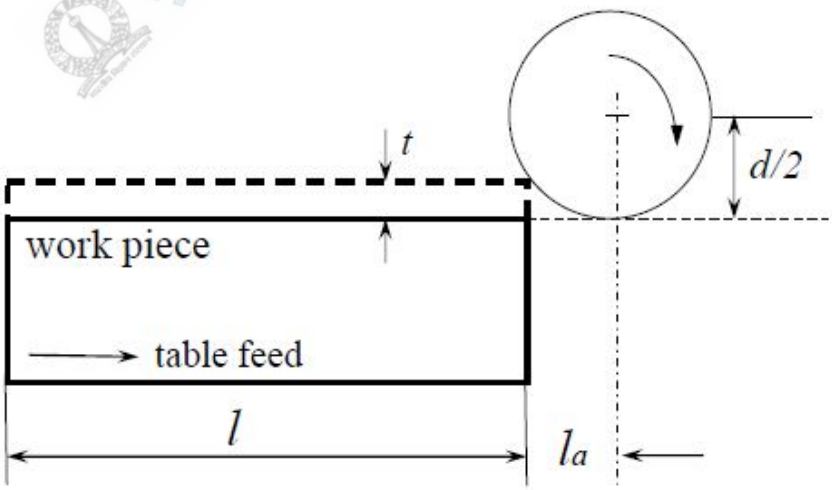
Question Number : 35 **Correct : 2 Wrong : 0**

A reversible heat engine (E) operating in a cycle interacts with three reservoirs 1, 2 and 3 maintained at temperatures $T_1 = 500$ K, $T_2 = 400$ K and $T_3 = 300$ K, respectively. The engine receives 10 kJ of heat from reservoir 1 and rejects 3 kJ to reservoir 3. The net work output, W_{net} (in kJ) from the engine is _____



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

A schematic diagram of peripheral milling is shown in the Figure.



If t is the depth of cut and d is the diameter of the milling cutter, then the length of approach (l_a) is expressed as

(A) $\sqrt{d(t-d)}$ (B) $\sqrt{d(d-t)}$ (C) $\sqrt{t(d-t)}$ (D) $\sqrt{t(t-d)}$

Question Number : 37 Correct : 2 Wrong : -0.66

An electrical appliances showroom sells 2,400 ceiling fans in one year (52 weeks). The holding cost is 10 % of the cost of the ceiling fan. The cost of one ceiling fan is Rs. 600. The cost incurred for placing an order is Rs. 201. There is a lead time of 5 weeks. The economic order quantity (EOQ) and the reorder level, respectively (rounded to the next higher integer) are

(A) 231, 127 (B) 38, 231 (C) 127, 231 (D) 127, 13

Question Number : 38 Correct : 2 Wrong : 0

In a calendar year, the demand forecast of motorbikes for the month of June is 200. The actual demand of motorbikes for the month of June and July are 300 and 350, respectively. If single exponential smoothing method with smoothing constant 0.7 is used, then the demand forecast for the month of August is _____

Question Number : 39 Correct : 2 Wrong : 0

In a project, tasks A, B, C, D, E, F, G, H, I and J are to be performed. The precedence relationships and the time required (in days) to complete the tasks are given in the Table.

Tasks	A	B	C	D	E	F	G	H	I	J
Time (days)	8	10	8	10	16	17	18	14	9	4
Preceding tasks	-	-	-	A	A	B, D	C	C	F, G	E, I, H

The time required (in days) to complete the project along the critical path is _____

Question Number : 40 Correct : 2 Wrong : 0

The potential production alternatives for manufacturing a product along with their unit cost and monthly capacity are given in the Table.

S. No.	Production Alternatives	Unit cost (Rs.)	Capacity / month
1	Regular time production	5	300
2	Overtime production	6	200
3	Subcontracting	10	500

The inventory at the end of July is 100 units. If the demand for the month of August is 620, then the minimum total cost (in Rs.) to meet the demand is _____

Question Number : 41 Correct : 2 Wrong : -0.66

The preparatory and miscellaneous codes used in CNC part programming and the functions are given in the Table.

Group I	Group II
P. G01	1. Circular interpolation, counter-clock wise
Q. G03	2. End of program
R. M06	3. Tool change
S. M02	4. Linear interpolation

The correct combination of code and the respective function is

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

Question Number : 42 Correct : 2 Wrong : 0

A surface of 30 mm × 30 mm of an iron block is machined using electrochemical machining process. The atomic weight and valency of iron is 55.85 and 2, respectively. The density of iron is 7,860 kg/m^3. If input current is 1,000 A and Faraday's constant is 96,540 Coulombs, then the feed rate (in mm/min) is _____ (up to *two* decimal places).

Question Number : 43 Correct : 2 Wrong : 0

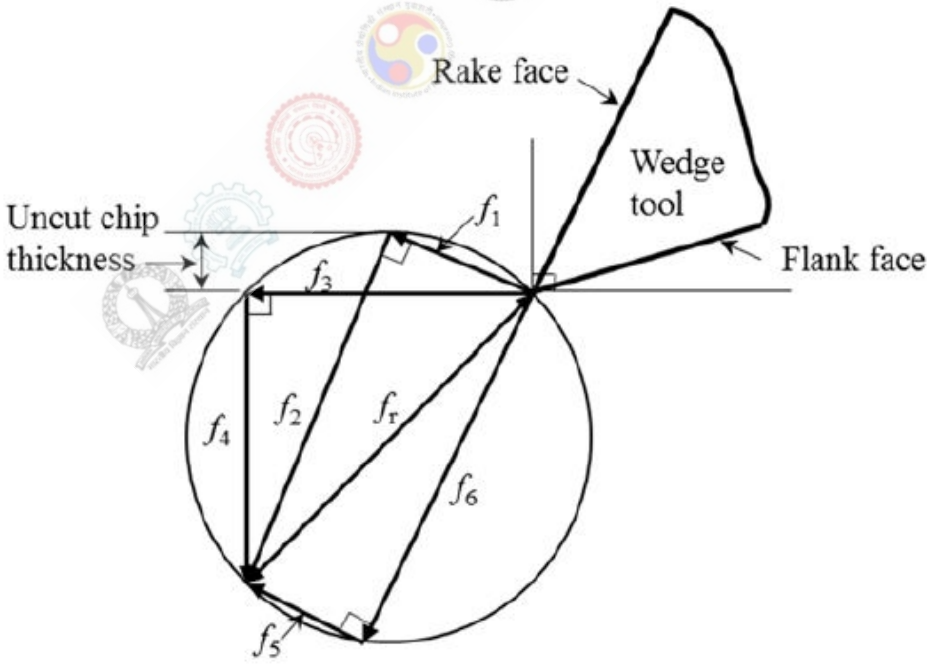
Quality control department of a company maintains 'c' chart to assess the quality of laptops. In this process, twenty laptops are examined randomly. The number of nonconformities observed per laptop is given in the Table.

Laptop number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Number of nonconformities	1	3	7	4	10	6	1	5	4	3	6	4	2	7	4	2	9	8	5	2

Based on the data, the upper control limit for the 'c' chart is _____ (up to *two* decimal places).

Question Number : 44 Correct : 2 Wrong : -0.66

The Merchant circle diagram showing various forces associated with a cutting process using a wedge-shaped tool is given in the Figure.



The coefficient of friction can be estimated from the ratio

(A) $\frac{f_1}{f_2}$ (B) $\frac{f_3}{f_4}$ (C) $\frac{f_5}{f_6}$ (D) $\frac{f_6}{f_5}$

Question Number : 45 **Correct : 2 Wrong : 0**

An air conditioner unit is expected to run continuously. The mean time between failures (MTBF) for this unit is 2,000 hours and the mean time to repair (MTTR) is 48 hours. The availability of the air conditioning unit is _____(up to *three* decimal places).

Question Number : 46 **Correct : 2 Wrong : 0**

A firm manufactures capacitors using a specialized process. The desired specification for the capacitance is 40 ± 10 picofarads (pF). The process used is in statistical control. If the process mean is 41 pF and the estimated standard deviation is 3 pF, then the process capability index C_{pk} is _____

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

A metallic strip having a thickness of 12 mm is to be rolled using two steel rolls, each of 800 mm diameter. It is assumed that there is no change in width of the strip during rolling. In order to achieve 10% reduction in cross-sectional area of the strip after rolling, the angle subtended (in degrees) by the deformation zone at the center of the roll is

(A) 1.84 (B) 3.14 (C) 6.84 (D) 8.23

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

An electron beam welding process uses 15 mA beam current at an accelerating voltage of 150 kV. The energy released per second by the beam (in J) is _____ (up to *one* decimal place).
(1 Ampere = 6.28×10^{18} electrons per second, 1 eV = 1.6×10^{-19} J)

Question Number : 49 Correct : 2 Wrong : -0.66

In a machine shop, four jobs need to be assigned to four different machines. Each of the jobs is to be assigned to one machine only at a time. The time taken to complete the job in different machines is given in the Table.

Jobs \ Machines	M_1	M_2	M_3	M_4
J_1	15	13	14	17
J_2	11	12	15	13
J_3	13	12	10	11
J_4	15	17	14	16

In order to ensure that the total time required to complete all the jobs is minimum, the optimal assignment of the job is

(A) $J_1 \Rightarrow M_4, J_2 \Rightarrow M_2, J_3 \Rightarrow M_3, J_4 \Rightarrow M_1$

(B) $J_1 \Rightarrow M_2, J_2 \Rightarrow M_1, J_3 \Rightarrow M_4, J_4 \Rightarrow M_3$

(C) $J_1 \Rightarrow M_2, J_2 \Rightarrow M_1, J_3 \Rightarrow M_3, J_4 \Rightarrow M_4$

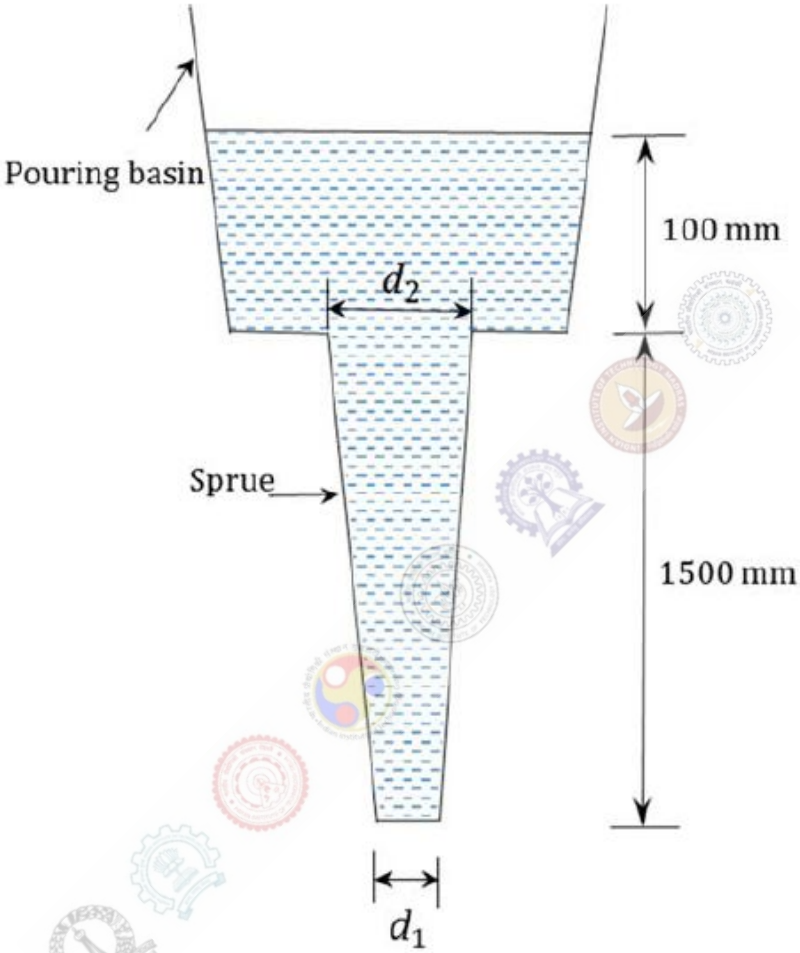
(D) $J_1 \Rightarrow M_4, J_2 \Rightarrow M_2, J_3 \Rightarrow M_1, J_4 \Rightarrow M_3$

Question Number : 50 Correct : 2 Wrong : 0

A hose coupling manufacturing company has production capacity of 2,500 units per year. The unit selling price of the item is Rs. 150. The fixed cost of production is Rs. 80,000 and variable cost of production per unit is Rs. 70. If the company wishes to achieve a profit of Rs. 20,000 during the calendar year, then the minimum quantity to be produced is _____

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

Schematic diagram of pouring basin and sprue of a gating system is shown in the Figure. Depth of molten metal in the pouring basin is 100 mm and the height of the sprue is 1,500 mm.

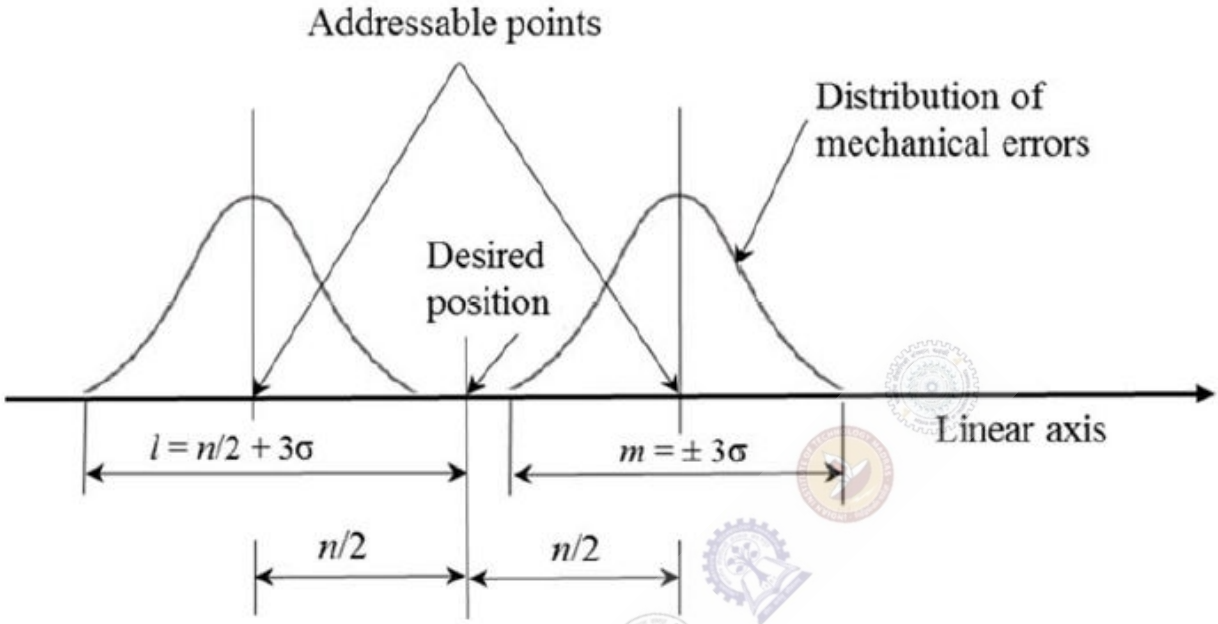


Considering the cross-section of the sprue is circular, the ratio $d_1 : d_2$ to avoid aspiration is

(A) 3:2 (B) 5:6 (C) 15:16 (D) 1:2

Question Number : 52 **Correct : 2 Wrong : -0.66**

In a numerical control (NC) machine positioning system, the measures of precision are expressed by considering a single axis as shown in the Figure.



If σ is standard deviation of the error distribution, then l, m and n are

(A) l = Accuracy, m = Repeatability, n = Control resolution
(B) l = Repeatability, m = Accuracy, n = Control resolution
(C) l = Control resolution, m = Repeatability, n = Accuracy
(D) l = Accuracy, m = Control resolution, n = Repeatability

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

In a machining operation with turning tool, the tool life (T) is related to cutting speed v (m/s), feed f (mm) and depth of cut d (mm) as

$$T = C\, v^{-2.5}\, f^{-0.9}\, d^{-0.15}$$

where, C is a constant. The suggested values for the cutting parameters are: $v = 1.5$ m/s, $f = 0.25$ mm and $d = 3$ mm for normal rough turning. If the operation is performed at twice the cutting speed and the other parameters remain unchanged, the corresponding percentage change in tool life is_____

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

The annual demand of wrist watches produced on an assembly line is 1,03,125 units. The line operates 50 weeks/year, 5 shifts/week and 7.5 hours/shift. The uptime efficiency of the line is 99%. The cycle time (T_c) of the assembly line (in minutes/unit) is_____ (up to *two* decimal places).

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

In a gear manufacturing company, three orders P, Q and R are to be processed on a hobbing machine. The orders were received in the sequence P – Q – R. The Table indicates the process time remaining and production calendar due date for each order.

Order	Process Time Remaining (day)	Due date
P	4	Day 20
Q	16	Day 30
R	6	Day 19

Considering today as the Day 10 in the production calendar of the Hobbing Shop, the sequence of the orders scheduled using the 'Critical Ratio' rule is

(A) P – Q – R
(B) P – R – Q
(C) Q – P – R
(D) Q – R – P

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

She has a sharp tongue and it can occasionally turn_____

(A) hurtful (B) left (C) methodical (D) vital

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

I _____ made arrangements had I _____ informed earlier.

(A) could have, been
(B) would have, being
(C) had, have
(D) had been, been

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

In the summer, water consumption is known to decrease overall by 25%. A Water Board official states that in the summer household consumption decreases by 20%, while other consumption increases by 70%.

Which of the following statements is correct?

(A) The ratio of household to other consumption is 8/17
(B) The ratio of household to other consumption is 1/17
(C) The ratio of household to other consumption is 17/8
(D) There are errors in the official's statement.

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

40% of deaths on city roads may be attributed to drunken driving. The number of degrees needed to represent this as a slice of a pie chart is

(A) 120
(B) 144
(C) 160
(D) 212

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

Some tables are shelves. Some shelves are chairs. All chairs are benches. Which of the following conclusions can be deduced from the preceding sentences?

i. At least one bench is a table
ii. At least one shelf is a bench
iii. At least one chair is a table
iv. All benches are chairs

(A) Only i
(B) Only ii
(C) Only ii and iii
(D) Only iv

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".

Here, the word 'antagonistic' is closest in meaning to

(A) impartial (B) argumentative (C) separated (D) hostile

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

S, T, U, V, W, X, Y, and Z are seated around a circular table. T's neighbours are Y and V. Z is seated third to the left of T and second to the right of S. U's neighbours are S and Y; and T and W are not seated opposite each other. Who is third to the left of V?

(A) X (B) W (C) U (D) T

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

Trucks (10 m long) and cars (5 m long) go on a single lane bridge. There must be a gap of at least 20 m after each truck and a gap of at least 15 m after each car. Trucks and cars travel at a speed of 36 km/h. If cars and trucks go alternately, what is the maximum number of vehicles that can use the bridge in one hour?

(A) 1440 (B) 1200 (C) 720 (D) 600

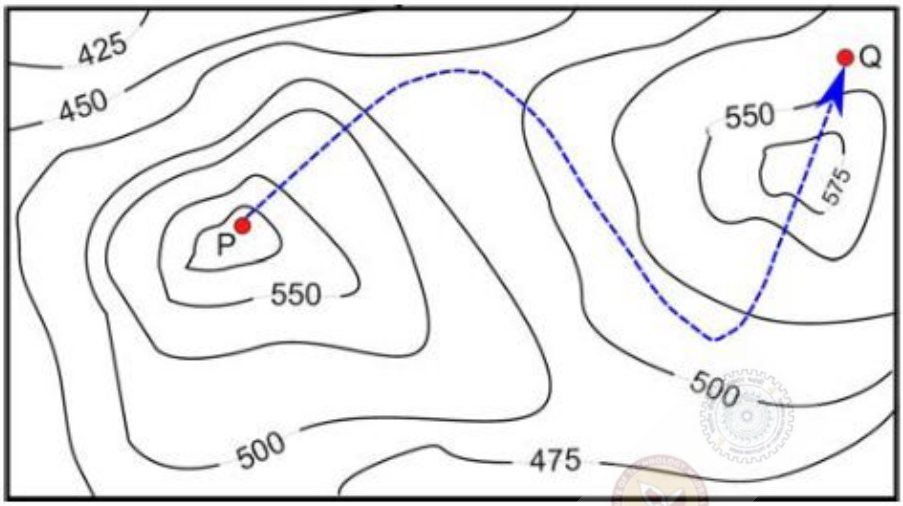
Question Number : 64 **Correct : 2 Wrong : -0.66**

There are 3 Indians and 3 Chinese in a group of 6 people. How many subgroups of this group can we choose so that every subgroup has at least one Indian?

(A) 56 (B) 52 (C) 48 (D) 44

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.



The path from P to Q is best described by

(A) Up-Down-Up-Down
(B) Down-Up-Down-Up
(C) Down-Up-Down
(D) Up-Down-Up

Q. No.	Type	Section	Key	Marks
1	MCQ	PI	C	1
2	MCQ	PI	D	1
3	MCQ	PI	A	1
4	MCQ	PI	D	1
5	MCQ	PI	B	1
6	MCQ	PI	A	1
7	NAT	PI	1.4 to 1.4	1
8	MCQ	PI	B	1
9	NAT	PI	0.41 to 0.42	1
10	MCQ	PI	B	1
11	MCQ	PI	C	1
12	MCQ	PI	C	1
13	MCQ	PI	C	1
14	MCQ	PI	A	1
15	NAT	PI	384 to 385	1
16	MCQ	PI	C	1
17	MCQ	PI	C	1
18	MCQ	PI	C	1
19	NAT	PI	1.80 to 1.85	1
20	MCQ	PI	D	1
21	MCQ	PI	A	1
22	MCQ	PI	B	1
23	MCQ	PI	D	1
24	MCQ	PI	D	1
25	MCQ	PI	B	1
26	MCQ	PI	C	2
27	MCQ	PI	A	2
28	NAT	PI	2.2 to 2.3	2
29	NAT	PI	70 to 70	2
30	NAT	PI	18.00 to 19.00	2
31	MCQ	PI	A	2
32	MCQ	PI	C	2
33	NAT	PI	2.0 to 2.0	2
34	NAT	PI	5.5 to 6.0	2
35	NAT	PI	3 to 3	2
36	MCQ	PI	C	2

37	MCQ	PI	C	2
38	NAT	PI	326 to 326	2
39	NAT	PI	48 to 48	2
40	NAT	PI	2900 to 2900	2
41	MCQ	PI	A	2
42	NAT	PI	2.40 to 2.50	2
43	NAT	PI	11.00 to 11.20	2
44	MCQ	PI	D	2
45	NAT	PI	0.970 to 0.980	2
46	NAT	PI	1 to 1	2
47	MCQ	PI	B	2
48	NAT	PI	2250.0 to 2265.0	2
49	MCQ	PI	B	2
50	NAT	PI	1250 to 1250	2
51	MCQ	PI	D	2
52	MCQ	PI	A	2
53	NAT	PI	-84 to -80 or 80 to 84	2
54	NAT	PI	1.00 to 1.10	2
55	MCQ	PI	D	2
56	MCQ	GA	A	1
57	MCQ	GA	A	1
58	MCQ	GA	D	1
59	MCQ	GA	B	1
60	MCQ	GA	B	1
61	MCQ	GA	D	2
62	MCQ	GA	A	2
63	MCQ	GA	A	2
64	MCQ	GA	A	2
65	MCQ	GA	C	2