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## Mechanical Engineering

## O. No. 1-25 Carry One Mark Each

1. A streamline and an equi-potential line in a flow field
(A) are parallel to each other
(B) are perpendicular to each other
(C) intersect at an acute angle
(D) are identical

## Answer: <br> (B)

2. If a mass of moist air in an airtight vessel is heated to a higher temperature, then
(A) Specific humidity of the air increases
(B) Specific humidity of the air decreases
(C) Relative humidity of the air increases
(D) Relative humidity of the air decreases

## Answer: (D)

3. In a condenser of a power plant, the steam condenses at a temperature of $60^{\circ} \mathrm{C}$. The cooling water enters at $30^{\circ} \mathrm{C}$ and leaves at $45^{\circ} \mathrm{C}$. The logarithmic mean temperature difference (LMTD) of the condenser is
(A) $16.2^{\circ} \mathrm{C}$
(B) $21.6^{\circ} \mathrm{C}$
(C) $30^{\circ} \mathrm{C}$
(D) $\quad 37.5^{\circ} \mathrm{C}$

## Answer: (B)

4. A simply supported beam PQ is loaded by a moment of $1 \mathrm{kN}-\mathrm{m}$ at the mid-span of the beam as shown in the figure. The reaction forces $R_{P}$ and $R_{Q}$ at supports $P$ and $Q$ respectively are

(A) 1 kN downward, 1 kN upward
(B) 0.5 kN upward, 0.5 kN downward
(C) 0.5 kN downward, 0.5 kNupward
(D) 1 kN upward, 1 kN upward

Answer: (A)
5. A double-parallelogram mechanisms shown in the figure.


Note that PQ is a single link. The mobility of the mechanism is
(A) -1
(B) 0
(C) 1
(D) 2

Answer: (C)
6. The maximum possible draft in cold rolling of sheet increases with the
(A) Increase in coefficient of friction
(B) Decrease in coefficient of friction
(C) Decrease in roll radius
(D) Increase in roll velocity

## Answer: (A)

7. The operation in which oil is permeated into the pores of a powder metallurgy product is known as
(A) Mixing
(B) Sintering
(C) Impregnation
(D) Infiltration

Answer: (C)
8. A hole is dimension $\phi 9_{+0}^{+0.015} \mathrm{~mm}$. The corresponding shaft is of dimension $\phi{ }_{+0.001}^{+0.010} \mathrm{~mm}$. The resulting assembly has
(A) Loose running fit
(B) Close running fit
(C) Transition fit
(D) Interference fit

Answer: (C)
9. Heat and work are
(A) Intensive properties
(B) Extensive properties
(C) Point functions
(D) Path functions

## Answer: (D)

10. A column has a rectangular cross-section of $10 \mathrm{~mm} \times 20 \mathrm{~mm}$ and a length of 1 m . The slenderness ratio of the column is close to
(A) 200
(B) 346
(C) 477
(D) 1000

Answer: (B)
11. A series expansion for the function $\sin \theta$ is
(A) $\quad 1-\frac{\theta^{2}}{2!}+\frac{\theta^{4}}{4!}-\ldots$.
(B) $\quad \theta-\frac{\theta^{3}}{3!}+\frac{\theta^{5}}{5!}-\ldots$.
(C) $1+\theta+\frac{\theta^{2}}{2!}+\frac{\theta^{3}}{3!}+\ldots$.
(D) $\quad \theta+\frac{\theta^{3}}{3!}+\frac{\theta^{5}}{5!}+\ldots$

Answer: (B)
12. Green sand mould indicates that
(A) Polymeric mould has been cured
(B) Mould has been totally dried
(C) Mould is green in colour
(D) Mould contains moisture

## Answer: (D)

13. What is $\lim _{\theta \rightarrow 0} \frac{\sin \theta}{\theta}$ equal to?
(A) $\theta$
(B) $\sin \theta$
(C) 0
(D) 1

Answer: (D)
14. Eigen values of a real symmetric matrix are always
(A) positive
(B) negative
(C) real
(D) complex

## Answer: (C)

15. A pipe of 25 mm outer diameter carries steam. The heat transfer coefficient between the cylinder and surroundings is $5 \mathrm{~W} / \mathrm{m}^{2} \mathrm{~K}$. It is proposed to reduce the heat loss from the pipe by adding insulation having a thermal conductivity of $0.05 \mathrm{~W} / \mathrm{mK}$. Which one of the following statements is TRUE?
(A) The outer radius of the pipe is equal to the critical radius
(B) The outer radius of the pipe is less than the critical radius
(C) Adding the insulation will reduce the heat loss
(D) Adding the insulation will increase the heat loss

## Answer: (C)

16. The contents of a well-insulated tank are heated by a resistor of $23 \Omega$ in which 10 A current is flowing. Consider the tank along with its contents as a thermodynamic system. The work done by the system and the heat transfer to the system are positive. The rates of heat $(\mathrm{Q})$, work $(\mathrm{W})$ and change in internal energy $(\Delta \mathrm{U})$ during the process in kW are
(A) $\mathrm{Q}=0, \mathrm{~W}=-2.3, \Delta \mathrm{U}=+2.3$
(B) $\mathrm{Q}=+2.3, \mathrm{~W}=0, \Delta \mathrm{U}=+2.3$
(C) $\mathrm{Q}=-2.3, \mathrm{~W}=0, \Delta \mathrm{U}=-2.3$
(D) $\mathrm{Q}=0, \mathrm{~W}=+2.3, \Delta \mathrm{U}=-2.3$

## Answer: (A)

17. Match the following criteria of material failure, under biaxial stresses $\sigma_{1}$ and $\sigma_{2}$ and yield stress $\sigma_{y}$ with their corresponding graphic representations:

| P. Maximum-normal-stress criterion | L. |
| :---: | :---: |
| Q. Maximum-distortion-energy criterion | M. |
| R. Maximum-shear-stress criterion | N . |

(A) P-M, Q-L, R-N
(B) P-N, Q-M, R-L
(C) $\mathrm{P}-\mathrm{M}, \mathrm{Q}-\mathrm{N}, \mathrm{R}-\mathrm{L}$
(D) P-N, Q-L,R-M

## Answer: (C)

18. The product of two complex numbers $1+\mathrm{i}$ and $2-5 \mathrm{i}$ is
(A) $7-3 \mathrm{i}$
(B) $3-4 \mathrm{i}$
(C) $\quad-3-4 \mathrm{i}$
(D) $7+3 \mathrm{i}$

Answer: (A)
19. Cars arrive at a service station according to Poisson's distribution with a mean rate of 5 per hour. The service time per car is exponential with a mean of 10 minutes. At steady state, the average waiting time in the queue is
(A) 10 minutes
(B) 20 minutes
(C) 25 minutes
(D) 50 minutes

## Answer: (D)

20. The word 'kanban' is most appropriately associated with
(A) Economic order quantity
(B) Just-in-time production
(C) Capacity planning
(D) Product design

## Answer: (B)

21. If $f(x)$ is an even function and is ' $a$ ' positive real number, then $\int_{-a}^{a} f(x) d x$ equals
(A) 0
(B) a
(C) 2 a
(D) $\quad 2 \int_{0}^{a} f(x) d x$

Answer: (D)
22. The coefficient of restitution of a perfectly plastic impact is
(A) 0
(B) 1
(C) 2
(D) $\infty$

Answer: (A)
23. A thin cylinder of inner radius 500 mm and thickness 10 mm is subjected to an internal pressure of 5 MPa . The average circum-ferential (hoop) stress in MPa is
(A) 100
(B) 250
(C) 500
(D) 1000

Answer: (B)
24. Which one among the following welding processes uses non-consumable electrode?
(A) Gas metal arc welding
(B) Submerged arc welding
(C) Gas tungsten arc welding
(D) Flux coated arc welding

## Answer: (C)

25. The crystal structure of austenite is
(A) Body centered cubic
(B) Face centered cubic
(C) Hexagonal closed packed
(D) Body centered tetragonal

Answer: (B)

## Q. No. 26 - 55 Carry Two Marks Each

26. A torque $T$ is applied at the free end of a stepped rod of circular cross-sections as shown in the figure. The shear modulus of the material of the rod is G . The expression for $d$ to produce an angular twist $\theta$ at the free end is

(A) $\left(\frac{32 \mathrm{TL}}{\pi \theta \mathrm{G}}\right)^{\frac{1}{4}}$
(B) $\left(\frac{18 \mathrm{TL}}{\pi \theta \mathrm{G}}\right)^{\frac{1}{4}}$
(C) $\left(\frac{16 \mathrm{TL}}{\pi \theta \mathrm{G}}\right)^{\frac{1}{4}}$
(D) $\left(\frac{2 T L}{\pi \theta G}\right)^{\frac{1}{4}}$

Answer: (B)
27. Figure shows the schematic for the measurement of velocity of air (density $=1.2 \mathrm{~kg} / \mathrm{m}^{3}$ ) through a constant-area duct using a pitot tube and a water-tube manometer.

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The differential head of water (density $=1000 \mathrm{~kg} / \mathrm{m}^{3}$ ) in the two columns of the manometer is 10 mm .
Take acceleration due to gravity as $9.8 \mathrm{~m} / \mathrm{s}^{2}$. The velocity of air in $\mathrm{m} / \mathrm{s}$ is
(A) 6.4
(B) 9.0
(C) 12.8
(D) 25.6

## Answer: (C)

28. The values of enthalpy of steam at the inlet and outlet of a steam turbine in a Rankine cycle are $2800 \mathrm{~kJ} / \mathrm{kg}$ and $1800 \mathrm{~kJ} / \mathrm{kg}$ respectively. Neglecting pump work, the specific steam consumption in $\mathrm{kg} / \mathrm{kW}$-hour is
(A) 3.60
(B) 0.36
(C) 0.06
(D) 0.01

Answer:
(A)
29. The integral $\int_{1}^{3} \frac{1}{x} d x$, when evaluated by using Simpson's $1 / 3$ rule on two equal subintervals each of length 1 , equals
(A) 1.000
(B) 1.098
(C) 1.111
(D) 1.120

Answer: (C)
30. Two identical ball bearings $P$ and $Q$ are operating at loads 30 kN and 45 kN respectively. The ratio of the life of bearing $P$ to the life of bearing $Q$ is
(A) $81 / 16$
(B) $27 / 8$
(C) $\quad 9 / 4$
(D) $3 / 2$

Answer: (B)
31. For the four-bar linkage shown in the figure, the angular velocity of link $A B$ is $1 \mathrm{rad} / \mathrm{s}$.


The length of link CD is 1.5 times the length of link AB . In the configuration shown, the angular velocity of link CD in rad/s is
(A) 3
(B) $\frac{3}{2}$
(C) 1
(D) $\frac{2}{3}$

## Answer: (D)

32. A stone with mass of 0.1 kg is catapulted as shown in the figure. The total force $\mathrm{F}_{\mathrm{x}}($ in N$)$ exerted by the rubber band as a function of distance $x\left(\right.$ in $m$ ) is given by $F_{x}=300 x^{2}$.


If the stone is displaced by 0.1 m from the un-stretched position $(\mathrm{x}=0$ ) of the rubber band, the energy stored in the rubber band is
(A) 0.01 J
(B) $\quad 0.1 \mathrm{~J}$
(C) 1 J
(D) $\quad 10 \mathrm{~J}$

Answer: (B)
33. Consider the differential equation $\frac{d y}{d x}=\left(1+y^{2}\right) x$. The general solution with constant c is
(A) $y=\tan \frac{x^{2}}{2}+\tan c$
(B) $y=\tan ^{2}\left(\frac{x}{2}+c\right)$
(C) $y=\tan ^{2}\left(\frac{x}{2}\right)+c$
(D) $y=\tan \left(\frac{x^{2}}{2}+c\right)$

Answer: (D)


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34. An unbiased coin is tossed five times. The outcome of each toss is either a head or a tail. The probability of getting at least one head is
(A) $\frac{1}{32}$
(B) $\frac{13}{32}$
(C) $\frac{16}{32}$
(D) $\frac{31}{32}$

Answer: (D)
35. A mass of 1 kg is attached to two identical springs each with stiffness $\mathrm{k}=20 \mathrm{kN} / \mathrm{m}$ as shown in the figure. Under frictionless condition, the natural frequency of the system in Hz is close to

(A) 32
(B) 23
(C) 16
(D) 11

Answer: (A)
36. The shear strength of a sheet metal is 300 MPa . The blanking force required to produce a blank of 100 mm diameter from a 1.5 mm thick sheet is close to
(A) 45 kN
(B) 70 kN
(C) 141 kN
(D) 3500 kN

Answer: (C)
37. The ratios of the laminar hydrodynamic boundary layer thickness to thermal boundary layer thickness of flows of two fluids P and Q on a flat plate are $\frac{1}{2}$ and 2 respectively. The Reynolds number based on the plate length for both the flows is $10^{4}$. The prandtl and Nusselt numbers for P are $\frac{1}{8}$ and 35 respectively. The Prandtl and Nusselt numbers for Q are respectively.
(A) 8 and 140
(B) 8 and 70
(C) 4 and 70
(D) 4 and 35

Answer: (A)
38. The crank radius of a single-cylinder I. C. engine is 60 mm and the diameter of the cylinder is 80 mm . The swept volume of the cylinder in $\mathrm{cm}^{3}$ is
(A) 48
(B) 96
(C) 302
(D) 603

Answer: (D)
39. A pump handling a liquid raises its pressure from 1 bar to 30 bar. Take the density of the liquid as 990 $\mathrm{kg} / \mathrm{m}^{3}$. The isentropic specific work done by the pump in $\mathrm{kJ} / \mathrm{kg}$ is
(A) 0.10
(B) 0.30
(C) 2.50
(D) 2.93

Answer: (D)
40. A spherical steel ball of 12 mm diameter is initially at 1000 K . It is slowly cooled in a surrounding of 300 K . The heat transfer coefficient between the steel ball and the surrounding is $5 \mathrm{~W} / \mathrm{m}^{2} \mathrm{~K}$. The thermal conductivity of steel is $20 \mathrm{~W} / \mathrm{mK}$. The temperature difference between the centre and the surface of the steel ball is
(A) Large because conduction resistance is far higher than the convective resistance
(B) Large because conduction resistance is far less than the convective resistance
(C) Small because conduction resistance is far higher than the convective resistance
(D) Small because conduction resistance is far less than the convective resistance

## Answer: (D)

41. An ideal Brayton cycle, operating between the pressure limits of 1 bar and 6 bar, has minimum and maximum temperatures of 300 K and 1500 K . The ratio of specific heats of the working fluid is 1.4 . The approximate final temperatures in Kelvin at the end of the compression and expansion processes are respectively
(A) 500 and 900
(B) 900 and 500
(C) 500 and 500
(D) 900 and 900

Answer: (A)
42. A disc of mass $m$ is attached to a spring of stiffness ' $k$ ' as shown in the figure. The disc rolls without slipping on a horizontal surface. The natural frequency of vibration of the system is

(A) $\frac{1}{2 \pi} \sqrt{\frac{\mathrm{k}}{\mathrm{m}}}$
(B) $\frac{1}{2 \pi} \sqrt{\frac{2 \mathrm{k}}{\mathrm{m}}}$
(C) $\frac{1}{2 \pi} \sqrt{\frac{2 \mathrm{k}}{3 \mathrm{~m}}}$
(D) $\frac{1}{2 \pi} \sqrt{\frac{3 \mathrm{k}}{2 \mathrm{~m}}}$

Answer: (C)
43. A 1 kg block is resting on a surface with coefficient of friction $\mu=0.1$. A force of 0.8 N is applied to the block as shown in figure. The friction force is


Answer: (B)
44. Consider the following system of equations

$$
\begin{gathered}
2 x_{1}+x_{2}+x_{3}=0, \\
x_{2}-x_{3}=0, \\
x_{1}+x_{2}=0 .
\end{gathered}
$$

This system has
(A) a unique solution
(B) no solution
(C) infinite number of solutions
(D) five solutions

## Answer: (C)

45. A single-point cutting tool with $12^{\circ}$ rake angle is used to machine a steel work-piece. The depth of cut, i.e. uncut thickness is 0.81 mm . The chip thickness under orthogonal machining condition is 1.8 mm . The shear angle is approximately
(A) $\quad 22^{\circ}$
(B) $26^{\circ}$
(C) $56^{\circ}$
(D) $76^{\circ}$

Answer: (B)
46. Match the following non-traditional machining processes with the corres-ponding material removal mechanisms:

Machining process
P. Chemical machining
Q. Electro-chemical machining
R. Electro - discharge machining
S. Ultrasonic machining

## Mechanism of material removal

1. Erosion
2. Corrosive reaction
3. Ion displacement
4. Fusion and vaporization
(A) $\mathrm{P}-2, \mathrm{Q}-3, \mathrm{R}-4, \mathrm{~S}-1$
(B) $\mathrm{P}-2, \mathrm{Q}-4, \mathrm{R}-3, \mathrm{~S}-1$
(C) $\mathrm{P}-3, \mathrm{Q}-2, \mathrm{R}-4, \mathrm{~S}-1$
(D) $\mathrm{P}-2, \mathrm{Q}-3, \mathrm{R}-1, \mathrm{~S}-4$

## Answer: <br> (A)

47. A cubic casting of 50 mm side undergoes volumetric solidification shrinkage and volumetric solid contraction of $4 \%$ and $6 \%$ respectively. No riser is used. Assume uniform cooling in all directions. The side of the cube after solidification and contraction is
(A) 48.32 mm
(B) 49.90 mm
(C) 49.94 mm
(D) 49.96 mm

Answer:
(A)

## Common Data Questions 48 \& 49

In an experimental set-up, air flows between two stations P and Q adiabatically. The direction of flow depends on the pressure and temperature conditions maintained at P and Q . The conditions at station P are 150 kPa and 350 K . The temperature at station Q is 300 K .

The following are the properties and relations pertaining to air:
Specific heat at constant pressure, $\mathrm{C}_{\mathrm{p}}=1.005 \mathrm{~kJ} / \mathrm{kgK}$;
Specific heat at constant volume, $\mathrm{C}_{\mathrm{v}}=0.718 \mathrm{~kJ} / \mathrm{kgK}$;
Characteristic gas constant, $\mathrm{R}=0.287 \mathrm{~kJ} / \mathrm{kgK}$
Enthalpy, $\mathrm{h}=\mathrm{C}_{\mathrm{p}} \mathrm{T}$
Internal energy, $\mathrm{u}=\mathrm{C}_{\mathrm{v}} \mathrm{T}$
48. If the air has to flow from station P to station Q , the maximum possible value of pressure in kPa at station Q is close to
(A) 50
(B) 87
(C) 128
(D) 150

Answer: (B)
49. If the pressure at station Q is 50 kPa , the change in entropy $\left(\mathrm{S}_{\mathrm{Q}}-\mathrm{S}_{\mathrm{P}}\right)$ in $\mathrm{kJ} / \mathrm{kgK}$ is
(A) -0.155
(B) 0
(C) 0.160
(D) 0.355

## Answer: (C)

## Common Data Questions: 50 \& 51

One unit of product $P_{1}$ requires 3 kg of resource $R_{1}$ and 1 kg of resource $R_{2}$. One unit of product $P_{2}$ requires 2 kg of resource $R_{1}$ and 2 kg of resource $\mathrm{R}_{2}$. The profits per unit by selling product $P_{1}$ and $P_{2}$ is Rs. 2000 and Rs. 3000 respectively. The manufacturer has 90 kg of resource $R_{1}$ and 100 kg of resource $\mathrm{R}_{2}$.
50. The unit worth of resource $R_{2}$ i.e., dual price of resource $R_{2}$ in Rs. Per kg is
(A) 0
(B) 1350
(C) 1500
(D) 2000

Answer: (A)
51. The manufacturer can make a maximum profit of Rs.
(A) 60000
(B) 135000
(C) 150000
(D) 200000

## Answer: (B)

## Statement for Linked Answer Questions: 52 \& 53

A triangular-shaped cantilever beam of uniform-thickness is shown in the figure. The Young's modulus of the material of the beam is E. A concentrated load $P$ is applied at the free end of the beam.

52. The area moment of inertia about the neutral axis of a cross-section at a distance x measured from the free end is
(A) $\frac{b x t^{3}}{6 \ell}$
(B) $\frac{\mathrm{bxt}^{3}}{12 \ell}$
(C) $\frac{\mathrm{bxt}^{3}}{24 \ell}$
(D) $\frac{\mathrm{xt}^{3}}{12}$

Answer: (B)
53. The maximum deflection of the beam is
(A) $\frac{24 \mathrm{P} \ell^{3}}{\mathrm{Ebt}^{3}}$
(B) $\frac{12 \mathrm{P} \ell^{3}}{\mathrm{Ebt}^{3}}$
(C) $\frac{8 \mathrm{P} \ell^{3}}{\mathrm{Ebt}^{3}}$
(D) $\frac{6 \mathrm{P} \ell^{3}}{\mathrm{Ebt}^{3}}$

Answer: (D)

## Statement for Linked Answer Questions: 54 \& 55

The temperature and pressure of air in a large reservoir are 400 K and 3 bar respectively. A convergingdiverging nozzle of exit area $0.005 \mathrm{~m}^{2}$ is fitted to the wall of the reservoir as shown in the figure.


The static pressure of air at the exit section for isentropic flow through the nozzle is 50 kPa . The characteristic gas constant and the ratio of specific heats of air are $0.287 \mathrm{~kJ} / \mathrm{kgK}$ and 1.4 respectively.
54. The density of air in $\mathrm{kg} / \mathrm{m}^{3}$ at the nozzle exit is
(A) 0.560
(B) 0.600
(C) 0.727
(D) 0.800

Answer: (C)
55. The mass flow rate of air through the nozzle in $\mathrm{kg} / \mathrm{s}$ is
(A) 1.30
(B) 1.77
(C) 1.85
(D) 2.06

Answer: (D)

## General Aptitude

## Q. No. 56-60 Carry One Mark Each

56. Choose the word from the options given below that is most nearly opposite in meaning to the given word:
"Amalgamate"
(A) merge
(B) split
(C) collect
(D) separate

Answer: (D)
57. Which of the following options is the closest in the meaning to the word below:
"Inexplicable"
(A) Incomprehensible
(B) Indelible
(C) Inextricable
(D) Infallible

## Answer: (A)

58. If $\log (\mathrm{P})=(1 / 2) \log (\mathrm{Q})=(1 / 3) \log (\mathrm{R})$, then which of the following options is TRUE ?
(A) $\mathrm{P}^{2}=\mathrm{Q}^{3} \mathrm{R}^{2}$
(B) $\mathrm{Q}^{2}=\mathrm{PR}$
(C) $\quad \mathrm{Q}^{2}=\mathrm{R}^{3} \mathrm{P}$
(D) $\quad \mathrm{R}=\mathrm{P}^{2} \mathrm{Q}^{2}$

## Answer: (B)

59. Choose the most appropriate word(s) from the options given below to complete the following sentence:
"I contemplated $\qquad$ Singapore for my vacation but decided against it."
(A) to visit
(B) having a visit
(C) visiting
(D) for a visit

Answer: (C)
60. Choose the most appropriate word from the options given below to complete the following sentence:
"If you are trying to make a strong impression on your audience, you cannot do so by being understated, tentative or $\qquad$ ."
(A) hyperbolic
(B) restrained
(C) argumentative
(D) indifferent

Answer: (B)

## Q. No. 61 to 65 Carry Two Marks Each

61. A container originally contains 10 litres of pure spirit. From this container I litre of sprit is replaced with 1 litre of water. Subsequently, 1 litre of the mixture is again replace with 1 litre of water and this process is repeated one more time. How much spirit is now left in the container?
(A) 7.58 litres
(B) 7.84 litres
(C) 7 litres
(D) 7.29 litres

Answer: (D)
62. Few school curricula include a unit on how to deal with bereavement and grief, and yet all students at some point in their lives suffer from losses through death and parting.

Based on the above passage which topic would not be included in a unit on bereavement?
(A) How to write a letter of condolence
(B) What emotional stages are passed through in the healing process
(C) What are the leading causes of death are
(D) How to give support to a grieving friend

Answer: (C)
63. $\mathrm{P}, \mathrm{Q}, \mathrm{R}$ and S are four types of dangerous microbes recently found in a human habitat.


The area of each circle with its diameter printed in brackets represents the growth of a single microbe surviving human immunity system within 24 hours of entering the body. The danger to human beings varies proportionately with the toxicity, potency and growth attributed to a microbe shown in the figure above: A pharmaceutical company is contemplating the development of a vaccine against the most dangerous microbe. Which microbe should the company target in its first attempt?
(A) P
(B) Q
(C) R
(D) S

Answer: (D)
64. The variable cost $(\mathrm{V})$ of manufacturing a product varies according to the equation $v=4 \mathrm{q}$, where q is the quantity produced. The fixed cost ( F ) of production of same product reduces with q according to the equation $\mathrm{F}=100 / \mathrm{q}$. How many units should be produced to minimize the total cost $(\mathrm{V}+\mathrm{F})$ ?
(A) 5
(B) 4
(C) 7
(D) 6

Answer: (A)
65. A transporter receives the same number of orders each day. Currently, he has some pending orders (backlog) to be shipped. If he uses 7 trucks, then at the end of the $4^{\text {th }}$ day he can clear all the orders. Alternatively, if he uses only 3 trucks, then all the orders are cleared at the end of the $10^{\text {th }}$ day. What is the minimum number of trucks required so that there will be no pending order at the end of the $5^{\text {th }}$ day?
(A) 4
(B) 5
(C) 6
(D) 7

Answer: (C)


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