

2. energy stored in a body when strained upto the breaking of a specimen

3. maximum strain energy which can be stored in a body

4. proof resilience per unit volume of a material

$$2. \frac{\pi}{16} \times \tau \times D^3$$

$$3. \frac{\pi}{32} \times \tau \times D^3$$

$$4. \frac{\pi}{64} \times \tau \times D^3$$

4.

1.7 to 4.5

4.

all of the above

Questions	Choices
Hammer blow	1. is the maximum vertical unbalanced force caused by the mass added to balance the reciprocating masses 2. varies inversely with the square of the speed 3. is the maximum horizontal unbalanced force caused by the mass provided to balance the reciprocating masses. 4. varies as the square root of the speed
In under damped vibrating system, the amplitude of vibration	1. increases exponentially with time 2. decreases exponentially with time 3. increases linearly with time 4. decreases linearly with time
Mobility of a statically indeterminate structure is	1. Less than equal to -1 2. 0 3. 1 4. Greater than or equal to 2

Questions	Choices
Two non-collinear parallel equal forces acting in opposite direction	1.balance each other 2.constitute a couple 3.constitute a moment 4.constitute a moment of couple
This is the term for the range of tightness or looseness resulting from the allowances and tolerances in mating parts	1.Limits 2.Fits 3.Specifications 4.Allowances
The single most valuable, flexible, and versatile geometric control is	1. concentricity 2. position 3. perpendicularity 4. straightness
What is the name of a system which brings together several technologies into a coherent system?	1. Focused integration systems 2. Portable manufacturing systems 3. Flexible manufacturing systems 4. Automated integration systems
What do Flexible Manufacturing systems (FMS) do?	1. Moves and manipulates products, parts or tolls 2.Co-ordinates the whole process of manufacturing and manufactures a part, component or product 3. Moves materials between operations 4. Completely manufactures a range of components without significant human intervention during the processing
The cone clutches have become obsolete because of	1. small cone angles 2. exposure to dirt and dust 3.

Questions	Choices
	<p>difficulty in disengaging</p> <p>4.</p> <p>all of these</p>
<p>In a gib and cotter joint, the gib and cotter are subjected to</p>	<p>1. Single shear only</p> <p>2. an axial tensile as well as compressive load</p> <p>3. The bending moment only</p> <p>4. only compressive axial load</p> <p>Double shear and crushing</p>
	<p>1. 0.048 mm</p> <p>2. 0.015 mm</p> <p>3.0.005 mm</p> <p>4.0.008 mm</p>
	<p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p>

Questions	Choices
In sand molding, a slick refers to	1. a round sieve 2. a long, flat metal plate fitted with an offset handle 3. used to make or repair corners in the mould 4. used to scoop sand deep in the mould
Metals are good conductors of heat because	1. Their atoms collide frequently 2. They have high density 3. They contain free electrons 4. Their atoms are relatively far apart
The value of Prandtl number for air is approximately	1. 0.287 2. 0.7 3. 1.0 4. 4.2
The main aim of compounding of steam turbine is to	1. avoid steam condensation 2. reduce rotor speed 3. improve efficiency 4. reduce steam consumption
Productivity can be rational defined by	1. Outputs/Inputs 2. Input + Output)/ Output 3. Output/(Input + Output) 4. Inputs/Outputs
In metrology, calibration is performed to _____	1. manufacture the equipment's 2. measure the repeatability of the instrument 3. measure the surface roughness 4. to fix the errors
The principle of transmissibility of forces	1. same at every point on its line of action 2. different at different points on its line of action

Questions	Choices
states that, when a force acts upon a body, its effect is	3. minimum, if it acts at the centre of gravity of the body 4. maximum, if it acts at the centre of gravity of the body
The angular velocity (in rad / s) of a body rotating at N revolutions per minute is	1. $2\pi N/60$ 2. $2\pi N/180$ 3. $\pi N/60$ 4. $\pi N/180$
A body of weight W is required to move up on rough inclined plane whose angle of inclination with the horizontal is a . The effort applied parallel to the plane is given by (where $\mu = \tan f$ = Coefficient of friction between the plane and the body.)	1. $P = W \tan a$ 2. $P = W (\cos a + \mu \sin a)$ 3. $P = W \tan(a + f)$ 4. $P = W (\sin a + \mu \cos a)$
The point, through which the whole weight of the body acts, irrespective of its position, is known as	1. moment of inertia 2. centre of percussion 3. centre of gravity 4. centre of mass
The angle of inclination of the plane at which the body begins to move down the plane, is called	1. angle of friction 2. none of these 3. angle of repose 4. angle of projection
Secondary forces in reciprocating mass on engine frame are	1. of same frequency as of primary forces 2. four times the frequency as of primary forces 3. twice the frequency as of primary forces 4. none of the options
Varingon's theorem of moments states that if a number of coplaner forces acting on a particle, then	1. their lines of action are at equal distances 2. the algebraic sum of their moments about any point is equal to the moment of their resultant force about the same point. 3. their algebraic sum is zero 4. the algebraic sum of their moments about any point in their plane is zero
One joule is equal to	1.1 N-m 2.100 N-m 3.0.1 N-m 4.10 N-m
	1. 2.

Questions	Choices
	3. 4.
According to lami's theorem	1.the three forces must be in equilibrium 2.the three forces must be equal 3.the three forces must be at 120° to each other 4.if the three forces acting at a point are in equilibrium, then each force is proportional to the sine of the angle between the other two
The coefficient of restitution for inelastic bodies is	1.one 2.zero 3.more than one 4.between zero and one
	1. 2. 3. 4.
A lead ball with a certain velocity is made to strike a wall, it falls down, but rubber ball of same mass and with same velocity strikes the same wall, it rebounds. Select the correct reason from the following:	1.both the balls undergo an equal change in momentum 2.the change in momentum suffered by rubber ball is less than the lead ball 3.the change in momentum suffered by rubber ball is more than the lead ball 4.none of the options
Which formula is used to calculate diametral pitch?	1. (number of teeth) x (pitch circle diameter) 2. (pitch circle diameter) / (number of teeth) 3. (number of teeth) / (pitch circle diameter) 4. None of the options are correct
Which of the following statements is true?	1. Photocell is used to measure light intensity

Questions	Choices
	<p>2. Planimeter is used to measure surface roughness</p> <p>3. According to Indian Standard 696 roughness value is to be measured in millimeter</p> <p>4. None of the options are correct</p>
Two forces are acting at an angle of 120° . The bigger force is 40N and the resultant is perpendicular to the smaller one. The smaller force is	<p>1.40 N 2.30 N 3.20 N 4.none of these options</p>
The centroid a T-section 100 mm x 150 mm x 50 mm from its bottom is	<p>1.87.5mm 2.50mm 3.75mm 4.125mm</p>
The range of projectile on a downward inclined plane is _____ the range on upward inclined plane for the same velocity of projection and angle of projection.	<p>1.less than 2. equal to 3.more than 4.All of these options</p>
The coefficient of friction depends on	<p>1.area of contact 2.strength of surfaces 3.nature of surface 4.all of these options</p>
A boat is traveling along a circular path having a radius of 20 m. Determine the magnitude of the boat's acceleration if at a given instant the boat's speed is $v = 5 \text{ m/s}$ and the rate of increase in speed is $v = 2 \text{ m/s}^2$.	<p>1.$a = 2.36 \text{ m/s}^2$ 2.$a = 12.50 \text{ m/s}^2$ 3.$a = 2.00 \text{ m/s}^2$ 4.$a = 1.25 \text{ m/s}^2$</p>
A diffuser is used to	<p>1.increase velocity and decrease pressure 2.increase velocity as well as pressure 3.decrease velocity and increase pressure 4.decrease velocity as well as pressure</p>
Which of the following temperature scales doesn't have negative numbers?	<p>1. Celsius 2. Kelvin 3.</p>

Questions	Choices
	<p>Fahrenheit</p> <p>4. Galileo</p>
<p>The ability by which a measuring device can detect small differences in the quantity being measured by it, is called its</p> <hr/>	<p>1. a) Damping 2. b) Sensitivity 3. d) Readability 4. c) Accuracy</p>
<p>The work output of a Reheat cycle operating under the same temperature limits is:</p>	<p>1. Same as that of Rankine cycle</p> <p>2. Greater than that of Rankine cycle</p> <p>3. Lesser than that of Ranking cycle</p> <p>4. Not able to correlate with provided data.</p>
<p>Critical speed of a shaft with a disc supported in between is equal to the natural frequency of the system in</p>	<p>1. Longitudinal vibration provided the shaft is vertical 2. Transverse vibration 3. Longitudinal vibrations 4. Torsional vibrations</p>
<p>If the rotating mass of a rim type flywheel is distributed on another rim type flywheel whose mean radius is half the mean radius of the former, then energy stored in the later at the same speed will be</p>	<p>1.Same as the first one 2.One and half times the first one 3.Four times the first one 4.One fourth of the first one</p>
<p>If the speed of the engine varies between 390 and 410 rpm in a cycle of operation, the coefficient of fluctuation of speed will be</p>	<p>1. 0.1 2. 0.2 3.</p>

Questions	Choices
	<p>0.5 (Real answer is 0.05)</p> <p>4. 0.7</p>
In a flywheel, the safe stress is 25.2 MN/m ² and the density is 7 g/cm ³ . Then what is the maximum peripheral velocity (in m/s)?	<p>1. 120 2. 60 3. 30 4. 45</p>
A reciprocating engine, running at 80 rad/s, is supported on springs. The static deflection of the spring is 1 mm. Take g=10m/s ² . When the engine runs what will be the frequency of vibration of the system?	<p>1.90 rad/s 2.100 rad/s 3.80 rad/s 4.120 rad/s</p>
The static deflection of a shaft under a flywheel is 4 mm. Take g=10m/s ² . What is the critical speed in rad/s?	<p>1.50 2.25 3.20 4.40</p>
The balancing weights are introduced in planes parallel to the plane of rotation of the disturbing mass. To obtain complete dynamic balance, the minimum number of balancing weights to be introduced in different planes is	<p>1. 3 2. 4 3. 1 4. 2</p>
Critical damping is a function of	<p>1. Stiffness and natural frequency 2. Mass and damping coefficient 3. Mass and stiffness 4. Natural frequency and damping coefficient</p>
Whirling speed of the shaft is the speed at which	<p>1. combination of transverse and longitudinal vibration occurs 2. shaft tends to vibrate vigorously in transverse direction 3. torsional vibrations occur 4. Shaft tends to vibrate in longitudinal direction</p>
In a system subjected to damped forced vibrations, the ratio of maximum displacement to the static deflection is known as	<p>1. Damping factor 2. Magnification factor 3. Critical damping ratio 4. Logarithmic decrement</p>

Questions	Choices
For steady state forced vibrations, the phase lag at resonance is	1. 45° 2. 90° 3. 0° 4. 180°
In reciprocating engines primary forces	1. are partially balanced 2. are balanced by secondary forces 3. cannot be balanced 4. are completely balanced
A governor is said to be isochronous when the equilibrium speed for all radii of rotation of the balls within the working range	1. varies uniformly 2. has uniform acceleration 3. is not constant 4. is constant
When the sleeve of a Porter governor moves upwards, the governor speed	1. first increases and then decreases 2. remains unaffected 3. increases 4. decreases
When the speed of the engine fluctuates continuously above and below the mean speed, the governor is said to be	1. unstable 2. stable 3. hunt 4. isochronous
In a four stroke I.C. engine, the turning moment during the compression stroke is	1. positive during major portion of the stroke 2. positive throughout 3. negative throughout 4. negative during major portion of the stroke
The engine of an aeroplane rotates in clockwise direction when seen from the tail end and the aeroplane takes a turn to the left. The effect of the gyroscopic couple on the aeroplane will be	1. to raise the nose and dip the tail 2. to dip the nose and raise the tail 3. to dip the nose and tail 4. to raise the nose and tail
A motor car moving at a certain speed takes a left turn in a curved path. If the engine rotates in the same direction as that of wheels, then due to the centrifugal forces	1. the reaction on the inner wheels increases and on the outer wheels decreases 2. the reaction on the outer wheels increases and on the inner wheels decreases 3. the reaction on the front wheels increases and

Questions	Choices
	<p>on the rear wheels decreases</p> <p>4. the reaction on the rear wheels increases and on the front wheels decreases</p>
<p>A rigid body, under the action of external forces, can be replaced by two masses placed at a fixed distance apart. The two masses form an equivalent dynamical system, if</p>	<p>1. the sum of two masses is equal to the total mass of the body</p> <p>2. the centre of gravity of the two masses coincides with that of the body</p> <p>3. the sum of mass moment of inertia of the masses about their centre of gravity is equal to the ma</p> <p>4. All of the answers</p>
<p>The maximum fluctuation of energy is the</p>	<p>1. difference between the maximum and minimum energies</p> <p>2. sum of maximum and minimum energies</p> <p>3. ratio of the maximum energy and minimum energy</p> <p>4. ratio of the mean resisting torque to the work done per cycle</p>
<p>The primary unbalanced force is maximum when the angle of inclination of the crank with the line of stroke is</p>	<p>1. 0°</p> <p>2. 90°</p> <p>3. 180°</p> <p>4. 360°</p>
<p>The partial balancing means</p>	<p>1. balancing partially the revolving masses</p> <p>2. balancing partially the reciprocating masses</p> <p>3. best balancing of engines</p> <p>4. all of the above</p>
<p>A flywheel of moment of inertia 9.8 kgm^2 fluctuates by 30 rpm for a fluctuation in energy of 1936 Joules. The mean speed of the flywheel is (in rpm)</p>	<p>1. 600</p> <p>2. 900</p> <p>3. 968</p>

Questions	Choices
	4. 2940
In a locomotive, the ratio of the connecting rod length to the crank radius is kept very large in order to	1.minimise the effect of primary forces 2. minimise the effect of secondary forces 3. have perfect balancing 4. start the locomotive quickly
The swaying couple is maximum or minimum when the angle of inclination of stroke (θ) is equal to	1. 45° and 135° 2. 90° and 135° 3. 135° and 225° 4. 45° and 225°
In a locomotive, the maximum magnitude of the unbalanced force along the perpendicular to the line of stroke, is known as	1. tractive force 2.swaying couple 3. hammer blow 4. blowing
In order to have a complete balance of the several revolving masses in different planes	1.the resultant couple must be zero 2.none of the options 3.the resultant force must be zero 4.both the resultant force and couple must be zero
In a vibrating system, if the actual damping coefficient is 40 N/m/s and critical damping coefficient is 420 N/m/s, then logarithmic decrement is equal to	1.0.2 2.0.4 3.0.6 4.0.8
When a body moves with simple harmonic motion, the product of its periodic time and frequency is equal to	1. 0.5 2. 6.28 3. 1 4. 3.14
If the ratio of frequency of excitation to the natural frequency of vibrations is	1. 1

Questions	Choices
1.414, then the transmissibility of vibration will be	2. 2 3. 0.5 4. 0
A shaft carrying three rotors will have	1. two nodes 2. three nodes 3. no node 4. one node
When a rigid body is suspended vertically and it oscillates with a small amplitude under the action of the force of gravity, the body is known as	1.torsional pendulum 2.second's pendulum 3.simple pendulum 4.compound pendulum
The secondary unbalanced force is maximum _____ in one revolution of the crank.	1.four times 2.eight times 3.two times 4.sixteen times
For two governors A and B, the lift of sleeve of governor A is more than that of governor B, for a given fractional change in speed. It indicates that	1.both governors A and B are equally sensitive 2.none of the options 3.governor A is more sensitive than governor B 4.governor B is more sensitive than governor A
Which of the following is used to control the speed variations of the engine caused by the fluctuations of the engine turning moment?	1.flywheel 2.none of these options 3.Governor 4.connecting rod
In a spring mass vibrating system, the natural frequency of vibration is reduced to half the value when a second spring is added to the first spring in series. Determine the stiffness of the second in terms of that of the first spring.	1. 1/3 of first spring 2. 3 times of first spring 3. 2 times of first spring 4. as the same of first spring
What is the minimum damping ratio for an underdamped system such that its overshoot	1. 0.59 2.

Questions	Choices
is limited to 10 percent?	<p>0.69</p> <p>3. 1 4. 1.59</p>
If magnification factor is high for constant damping factor	<p>1. the excitation frequency may get resonance or near the resonance</p> <p>2. the excitation frequency may be higher than resonance</p> <p>3. the excitation frequency may be lower than resonance</p> <p>4. none of these</p>
What type of vibration is predominant in the beam structure?	<p>1. Transverse</p> <p>2. longitudinal</p> <p>3. torsional</p> <p>4. none of these</p>
If a number of forces act simultaneously on a particle, it is possible	<p>1.to replace them by a single force</p> <p>2.to replace them by a couple</p> <p>3.not to replace them by a single force</p> <p>4.to replace them by a single force through C.G.</p>
Which of the following do not have identical dimensions ?	<p>1.Momentum and impulse</p> <p>2.Torque and work</p> <p>3.Torque and energy</p> <p>4.None of these options</p>
The weight of a body is due to	<p>1.gravitational pull exerted by the earth</p> <p>2.centrifugal force of earth</p> <p>3.gravitational force of attraction towards the center of the earth.</p> <p>4.forces experienced by body in atmosphere</p>
Two balls of equal mass and of perfectly elastic material are lying on the floor. One of the ball with velocity v is made to struck the second ball. Both the balls after	<p>1.v</p> <p>2.v/4</p> <p>3.v/2</p> <p>4.v/8</p>

Questions	Choices
impact will move with a velocity	
Moment of inertia of a triangular section of base (b) and height (h) about an axis passing through its C.G. and parallel to the base, is	1. $bh^3/4$ 2. $bh^3/12$ 3. $bh^3/8$ 4. $bh^3/36$
A number of forces acting at a point will be in equilibrium if	1.their total sum is zero 2.two resolved parts in two directions at right angles are equal 3.sum of resolved parts in any two perpendicular directions are both zero 4.none of these options
D' Alembert's principle is used for	1.determining stresses in the truss 2.solving kinematic problems 3.reducing the problem of kinetics to equivalent statics problem 4.stability of floating bodies
A heavy ladder resting on floor and against a vertical wall may not be in equilibrium, if	1.the floor is smooth, the wall is rough 2.the floor and wall both are smooth surfaces 3.the floor is rough, the wall is smooth 4.will be in equilibrium under all conditions.
The ratio of limiting friction and normal reaction is known as	1.coefficient of friction 2.angle of repose 3.angle of friction 4.friction resistance.
Pick up wrong statement about friction force for dry surfaces. Friction force is	1.dependent on the materials of contact surface 2.independent of the area of contact surfaces 3.proportional to normal load between the surfaces 4.proportional to velocity of sliding
Coulomb friction is the friction between	1.bodies having relative motion 2.two lubricated surfaces 3.two dry surfaces 4.solids and liquids
Dynamic friction as compared to static friction is	1.more 2.may be less or more depending on nature of surfaces and velocity 3.same 4.less
The maximum frictional force which comes into play when a body just begins to slide over another surface is called	1.limiting friction 2.rolling friction 3.sliding friction 4.kinematic friction
A flywheel on a motor goes	1.25 2.100 3.50 4.250

Questions	Choices
from rest to 1000 rpm in 6 sec. The number of revolutions made is nearly equal to	
A boat is traveling along a circular path having a radius of 20 m. Determine the magnitude of the boat's acceleration if at a given instant the boat's speed is $v = 5 \text{ m/s}$ and the rate of increase in speed is $v = 2 \text{ m/s}^2$.	1.a = 2.36 m/s ² 2.a = 12.50 m/s ² 3.a = 2.00 m/s ² 4.a = 1.25 m/s ²
A train travels along a horizontal circular curve that has a radius of 200 m. If the speed of the train is uniformly increased from 30 km/h to 45 km/h in 5 s, determine the magnitude of the acceleration at the instant the speed of the train is 40 km/h.	1.a = 0.617 m/s ² 2.a = 1.451 m/s ² 3.a = 1.037 m/s ² 4.a = 0.833 m/s ²
The mechanism used in a shaping machine is	1. a closed 4-bar chain having 4 revolute pairs 2. a closed 6-bar chain having 6 revolute pairs 3. a closed 4-bar chain having 2 revolute pair and 2 sliding pairs 4. an inversion of the single slider-crank chain
The lengths of the links of a 4-bar linkage with revolute pairs only are p, q, r and s units. Given that $p < q < r < s$. Which of these links should be the fixed one, for obtaining a "double crank" mechanism?	1. links of length 'p' 2. links of length 'q' 3. links of length 'r' 4. links of length 's'
The number of degrees of freedom of a planar linkage with 8 links and 9 simple revolute joint is	1. 1 2.

Questions	Choices
	<p>2 3. 3 4. 4</p>
<p>In a four-bar linkage, S denotes the shortest link length, L is the longest link length, P and Q are the lengths of other two links. At least one of the three moving links will rotate by 360 degree if</p>	<p>1. S + L less than or equal to P + Q 2. S + L > to P + Q 3. S + P less than or equal to L + Q 4. S + P > to L + Q</p>
<p>For a four bar linkage in toggle position, the value of mechanical advantage is?</p>	<p>1. 0 2. 0.5 3. 1 4. infinite</p>
<p>The mechanism used in a shaping machine is</p>	<p>1. a closed 4-bar chain having 4 revolute pairs 2. a closed 6-bar chain having 6 revolute pairs 3. a closed 4-bar chain having 2 revolute pair and 2 sliding pairs 4. an inversion of the single slider-crank chain</p>
<p>The lengths of the links of a 4-bar linkage with revolute pairs only are p, q, r and s units. Given that $p < q < r < s$. Which of these links</p>	<p>1. links of length p 2. links of length q</p>

Questions	Choices
should be the fixed one, for obtaining a "double crank" mechanism?	3. links of length r 4. links of length s
In order to draw the acceleration diagram, it is necessary to determine the Coriolis component of acceleration in the case of	1. crank and slotted lever quick return mechanism 2. slider-crank mechanism 3. four bar mechanism 4. pantograph
The direction of linear velocity of any point on a link with respect to another point on the same link is	1. parallel to the link 2. perpendicular to the link joining the points 3. at 45 degree to the link joining the points 4. at 30 degree
Ball and socket forms a	1. turning pair 2. rolling pair 3. sliding pair 4. Spherical Pair
A combination of kinematic pairs, joined in such a way that the relative motion between link is completely constrained, is called as	1. structure 2. mechanism 3. kinematic chain 4. inversion

Questions	Choices
which of the following is an inversion of slider crank chain?	1. beam engine 2. watt indicator 3. elliptical trammel 4. whitworth quick return motion mechanism
In SHM motion, acceleration is proportional to	1. velocity 2. displacement 3. rate of change of velocity 4. stroke
For a SHM motion of the follower, a cosine curve represents	1. displacement 2. velocity 3. acceleration 4. jerk
cam size depends on	1. base circle 2. prime circle 3. pitch circle 4. outer circle
Transmission angle is the angle between	1. Input link and coupler 2. Input link and fixed link 3.

Questions	Choices
	<p>Output link and coupler</p> <p>4. Output link and fixed link</p>
A fixed gear having 200 teeth is in mesh with another gear having 50 teeth. The two gears are connected by an arm. The number of turns made by the smaller gear for one revolution of arm about the centre of bigger gear is	<p>1.</p> <p>2</p> <p>2. 4</p> <p>3.</p> <p>3</p> <p>4.</p> <p>5</p>
In ideal machines, mechanical advantage is _____ velocity ratio.	<p>1. equal to</p> <p>2. greater than</p> <p>3. none of these</p> <p>4. less than</p>
Concurrent forces are those forces whose lines of action	<p>1.meet on the same plane</p> <p>2.lie on the same line</p> <p>3.meet at one point</p> <p>4.none of these options</p>
The motion of a particle round a fixed axis is	<p>1. rotary</p> <p>2. translatory</p> <p>3. circular</p> <p>4. translatory as well as rotatory</p>
If a number of forces are acting at a point, their resultant will be inclined at an angle θ with the horizontal, such that	<p>1. $\tan \theta = \sum V_x \sum H$</p> <p>2. $\tan \theta = \sum V_x \sum V$</p> <p>3. $\tan \theta = \sum H / \sum V$</p> <p>4. $\tan \theta = \sum V / \sum H$</p>
The unit of energy in S.I. units is	<p>1. watt</p> <p>2. dyne</p> <p>3. kg-m</p> <p>4. joule</p>
Whenever a force acts on a body and the body undergoes a displacement, then	<p>1. work is said to be done</p> <p>2. power is being transmitted</p> <p>3. body has kinetic energy of translation</p> <p>4. none of these</p>
The rate of doing work is known as	<p>1. kinetic energy</p> <p>2. none of these</p> <p>3. power</p>

Questions	Choices
	4. potential energy
The resultant of the two forces P and Q is R. If Q is doubled, the new resultant is perpendicular to P. Then	1. $Q = 2R$ 2. $Q = R$ 3. $P = Q$ 4. none of these
When the spring of a watch is wound, it will possess	1. electrical energy 2. heat energy 3. kinetic energy 4. strain energy
The total energy possessed by a system of moving bodies	1. is minimum in the start and maximum at the end 2. is maximum in the start and minimum at the end 3. varies from point to point 4. is constant at every instant
The static friction	1. is independent of the area of contact, between the two surfaces 2. always acts in a direction, opposite to that in which the body tends to move 3. bears a constant ratio to the normal reaction between the two surfaces 4. all of the above
Which of the following are vector quantities?	1. Angular velocity 2. Angular displacement 3. all of these 4. Angular acceleration
The term 'centroid' is	1.none of the options 2.the point of suspension 3.the point of application of the resultant of all the forces tending to cause a body to rotate about a certain axis 4.the same as centre of gravity
The matter contained in a body, is called	1.momentum 2.mass 3.impulsive force 4.weight
If P is the force acting on the body, m is the mass of the body and a is the acceleration of the body, then according to Newton's second law of motion,	1. $P - m.a = 0$ 2. $P \times m.a = 0$ 3. $P + m.a = 0$ 4. $P/m.a = 0$
The energy possessed by a body, for doing work by virtue of its position, is called	1.chemical energy 2.electrical energy 3.potential energy 4.kinetic energy
In order to completely specify angular displacement	1.magnitude of angular displacement 2.all of these options

Questions	Choices
by a vector, it must fix	3.direction of the axis of rotation 4.sense of angular displacement
If a body is acted upon by a number of coplaner non-concurrent forces, it may	1.rotate about itself without moving 2. be completely at rest 3.move in any one direction rotating about itself 4.all of these options
A number of forces acting at a point will be in equilibrium, if	1.sumof resolved parts in the vertical direction is zero (i.e. $\sum V = 0$) 2.sum of all the forces is zero 3.all the forces are equally inclined 4.none of these options
Which is the correct statement about law of polygon of forces ?	1. if any number of forces acting at a point can be represented by the sidesof a polygon taken in equilibrium 2. if any number of forces acting at a point can be represented in direction and magnitude by the sides of a polygon, then the forces are in equilibrium 3. if a polygon representing forces acting at a point is closed then forces are in equilibrium 4. none of the above.
The product of either force or couple with the arm of the couple is called	1.resultant couple 2.moment of the forces 3.moment of the couple 4.none of these options
The 2-m-long bar is confined to move in the horizontal and vertical slots A and B. If the velocity of the slider block at A is 6 m/s, determine the bar's angular velocity and the velocity of block B at the instant $= 60^\circ$.	1. angular velocity of B = 3.46 rad/s , vB = 3.46 m/s 2. angular velocity of B = 3.00 rad/s , vB = 3.00 m/s 3. angular velocity of B = 3.00 rad/s , vB = 6.00 m/s 4. angular velocity of B = 6.00 rad/s , vB = 10.39 m/s
A race car starting from rest moves along a straight track with an acceleration as shown in the graph (where for t 10 s, $a = 8 \text{ m/s}^2$). Determine the time t for the car to reach a speed of 50	1. t = 11.25 s 2. t = 6.25 s 3. t = 12.5 s

Questions	Choices
m/s.	4. $t = 3.53 \text{ s}$
<p>A two-stage missile is fired vertically from rest with an acceleration as shown in the graph. In 15 s the first stage A burns out and the second stage B ignites. How fast is the rocket moving and how far has it gone at $t = 20 \text{ s}$? How fast is the missile moving and how far has it gone at $t = 20 \text{ s}$?</p>	<p>1. $v = 430 \text{ m/s}, s = 4.30 \text{ km}$ 2. $v = 395 \text{ m/s}, s = 3.69 \text{ km}$</p> <p>3. $v = 360 \text{ m/s}, s = 3.60 \text{ km}$</p> <p>4. $v = 500 \text{ m/s}, s = 5.00 \text{ km}$</p>
<p>The v-s graph for a rocket sled is shown. Determine the acceleration of the sled when $s = 100 \text{ m}$ and $s = 175 \text{ m}$.</p>	<p>1. $a_{100} = 3.75 \text{ m/s}^2, a_{175} = -1.250 \text{ m/s}^2$ 2. $a_{100} = 11.11 \text{ m/s}^2, a_{175} = -25.0 \text{ m/s}^2$</p> <p>3. $a_{100} = 0.333 \text{ m/s}^2, a_{175} = -1.000 \text{ m/s}^2$</p> <p>4. $a_{100} = 33.3 \text{ m/s}^2, a_{175} = -25 \text{ m/s}^2$</p>
<p>The pilot of fighter plane F is following 1.5 km behind the pilot of bomber B. Both planes are originally traveling at 120 m/s. In an effort to pass the bomber, the pilot in F gives his plane a constant acceleration of 12 m/s². Determine the speed at which the pilot in the bomber sees the pilot of the fighter plane pass at the start of the passing operation the bomber is decelerating at 3 m/s². Neglect the effect of any turning.</p>	<p>1. $v_{F/B} = 150 \text{ m/s}$</p> <p>2. $v_{F/B} = 367 \text{ m/s}$</p> <p>3. $v_{F/B} = 90 \text{ m/s}$</p> <p>4. $v_{F/B} = 212 \text{ m/s}$</p>
<p>A car, initially at rest, moves along a straight road with constant acceleration such</p>	<p>1.$v_{avg} = 80.0 \text{ ft/s}, a_{avg} = 15.15 \text{ ft/s}^2$ 2. $v_{avg} = 45.2 \text{ ft/s}, a_{avg} = 13.91 \text{ ft/s}^2$</p> <p>3.$v_{avg} = 80.0 \text{ ft/s}, a_{avg} = 12.57 \text{ ft/s}^2$</p>

Questions	Choices
<p>that it attains a velocity of 60 ft/s when $s = 150$ ft. Then after being subjected to another constant acceleration, it attains a final velocity of 100 ft/s when $s = 325$ ft. Determine the average velocity and average acceleration of the car for the entire 325-ft displacement.</p>	<p>4. $v_{avg} = 55.0$ ft/s, $a_{avg} = 15.15$ ft/s2</p>
<p>The motorcyclist attempts to jump over a series of cars and trucks and lands smoothly on the other ramp, i.e., such that his velocity is tangent to the ramp at B. Determine the launch speed v_A necessary to make the jump.</p>	<p>1. $v_A = 11.90$ m/s 2. $v_A = 11.07$ m/s 3. $v_A = 16.83$ m/s 4. $v_A = 15.66$ m/s</p>
<p>A ball thrown vertically upward from the top of a building with an initial velocity of $v_A = 35$ ft/s. Determine (a) how high above the top of the building the ball will go before it stops at B, (b) the time t_{AB} it takes to reach its maximum height, and (c) the total time t_{AC} needed for it to reach the ground at C from the instant it is released.</p>	<p>1. $h = 62.4$ ft, $t_{AB} = 3.57$ s, $t_{AC} = 7.14$ s 2. $h = 19.02$ ft, $t_{AB} = 1.087$ s, $t_{AC} = 2.17$ s 3. $h = 19.02$ ft, $t_{AB} = 1.087$ s, $t_{AC} = 3.30$ s 4. $h = 62.4$ ft, $t_{AB} = 3.57$ s, $t_{AC} = 8.56$ s</p>
<p>As the instant shown, cars A and B are traveling at speeds of 20 mi/h and 45 mi/h, respectively. If B is accelerating at 1600 mi/h2 while A maintains a constant speed, determine the magnitudes of the velocity and acceleration of A with respect to B.</p>	<p>1. $v_{A/B} = 33.9$ mi/h, $a_{A/B} = 1600$ mi/h2 2. $v_{A/B} = 60.8$ mi/h, $a_{A/B} = 1600$ mi/h2 3. $v_{A/B} = 33.9$ mi/h, $a_{A/B} = 1426$ mi/h2 4. $v_{A/B} = 60.8$ mi/h, $a_{A/B} = 1426$ mi/h2</p>

Questions	Choices
<p>A boy throws a snowball such that it strikes the wall of the building at the maximum height of its trajectory. If it takes $t = 1.5$ s to travel from A to B, determine the velocity v_A at which it was thrown, the angle of release , and the height h.</p>	<p>1. $v_A = 12.00 \text{ ft/s}, \theta = 24.4^\circ, h = 21.7 \text{ ft}$</p> <p>2. $v_A = 49.8 \text{ ft/s}, \theta = 76.0^\circ, h = 39.7 \text{ ft}$</p> <p>3. $v_A = 36.3 \text{ ft/s}, \theta = 24.4^\circ, h = 18.2 \text{ ft}$</p> <p>4. $v_A = 48.3 \text{ ft/s}, \theta = 65.6^\circ, h = 39.7 \text{ ft}$</p>
<p>For a short time the missile moves along the parabolic path $y = (18 - 2x^2) \text{ km}$. If motion along the ground is measured as $x = (4t - 3) \text{ km}$, where t is in seconds, determine the magnitudes of the missile's velocity and acceleration when $t = 1$ s.</p>	<p>1. $v = 5.66 \text{ km/s}, a = 4.0 \text{ km/s}^2$</p> <p>2. $v = 16.49 \text{ km/s}, a = 64.0 \text{ km/s}^2$</p> <p>3. $v = 16.00 \text{ km/s}, a = 22.6 \text{ km/s}^2$</p> <p>4. $v = 4.00 \text{ km/s}, a = 16.03 \text{ km/s}^2$</p>
<p>A chain that has a negligible mass is draped over a sprocket which has a mass of 2 kg and a radius of gyration of $k_O = 50 \text{ mm}$. If the 4-kg block A is released from rest in the position shown, $s = 1 \text{ m}$, determine the angular velocity which the chain imparts th the sprocket when $s = 2 \text{ m}$.</p>	<p>1. 44.3 rad/s</p> <p>2. 39.6 rad/s</p> <p>3. 41.8 rad/s</p> <p>4. 59.1 rad/s</p>
<p>The 50-kg cylinder has an angular velocity of 30 rad/s when it is brought into contact with the horizontal surface at C. If the coefficient of friction is $c = 0.2$, determine how long it takes for the cylinder to stop spinning. What force is developed at the pin A during this time? The axis of the</p>	<p>1. $t = 1.529 \text{ s}, A = 0$</p> <p>2. $t = 3.06 \text{ s}, A = 0$</p> <p>3. $t = 1.529 \text{ s}, A = 49.1 \text{ N}$</p> <p>4. $t = 3.06 \text{ s}, A = 49.1 \text{ N}$</p>

Questions	Choices
cylinder is connected to two symmetrical links. (Only AB is shown.) For the computation, neglect the weight of the links.	
A cord of negligible mass is wrapped around the outer surface of the 2-kg disk. If the disk is released from rest, determine its angular velocity in 3 s.	1. 183.9 rad/s 2. 735 rad/s 3. 245 rad/s 4. 263 rad/s
The irregular area has a moment of inertia about the AA axis of $35(106)$ mm ⁴ . If the total area is $12.0(103)$ mm ² , determine the moment of inertia if the area about the BB axis. The DD axis passes through the centroid C of the area.	1. $IBB = 5.00(106)$ mm ⁴ 2. $IBB = 17.00(106)$ mm⁴ 3. $IBB = 16.80(106)$ mm ⁴ 4. $IBB = 55.4(106)$ mm ⁴
The radial distance of a tooth from pitch circle to the bottom of the tooth is called	1. dedendum 2. addendum 3. clearance 4. working depth
The module is reciprocal of	1. diametrical pitch 2. circular pitch 3. pitch diameter 4. pressure angle

Questions	Choices
The condition for correct gearing is	<p>1. pitch line velocities of teeth be same</p> <p>2. radius of curvature of two profile be same</p> <p>3. common normal to the pitch surface cuts the line of centres at a fixed point</p> <p>4. pitch line velocities of teeth different</p>
Interference can be avoided in involute gears with 20 degree pressure angle by	<p>1. cutting involute correctly</p> <p>2. using as small number of teeth as possible</p> <p>3. using more than 20 teeth</p> <p>4. using more than 8 teeth</p>
In simple gear train, if the number of idle gears is odd, then the motion of driven gear will	<p>1. be same as that of driving gear</p> <p>2. be opposite as that of driving gear</p> <p>3. depend upon the number of teeth on the driving gear</p> <p>4. depend upon the number of teeth on the driven gear</p>
The train value of gear is	<p>1. equal to velocity ratio of a gear train</p> <p>2. reciprocal of velocity ratio of a gear train</p> <p>3. always greater than unity</p> <p>4. always less than unity</p>
In a gear train, when the axes of the shafts, over which the gears are mounted, move relative	<p>1. epicyclic gear train</p> <p>2.</p>

Questions	Choices
to a fixed axis is called	<p>reverted gear train</p> <p>3. compound gear train</p> <p>4. simple gear train</p>
A differential gear in automobile is used to	<p>1. reduce the speed</p> <p>2. assist in changing in speed</p> <p>3. provide jerk free movement of vehicle</p> <p>4. help in turning</p>
The angle between the direction of the follower motion and a normal to the pitch curve is called	<p>1. pitch angle</p> <p>2. prime angle</p> <p>3. base angle</p> <p>4. pressure angle</p>
The following is not included in title block of drawing sheet.	<p>1.Sheet No 2.Scale 3.Method of Projection 4. Size of sheet</p>
Which of the following represent reducing scale?	<p>1.1:1 2. 1:2 3.2:1 4.10:1</p>
In first angle projection method, object is assumed to be placed in	<p>1.First quadrant 2.Second quadrant 3.Third quadrant4.Fourth quadrant</p>
Metric thread of 10mm diameter is represented by	<p>1.10M 2.M10 3.M^{10} 4.None of the above</p>
In a radial cam, the	<p>1.</p>

Questions	Choices
follower moves	<p>in a direction perpendicular to the cam axis</p> <p>2. in a direction parallel to cam axis</p> <p>3.</p> <p>in any direction irrespective of the cam axis</p> <p>4. along the cam axis</p>
<p>This means that a feature of a finished product contains the maximum amount of material permitted by the tolerated dimensions for that feature:</p>	<p>1. Maximum material condition</p> <p>2. Machined material condition</p> <p>3. Maximum machined indication</p> <p>4. Machine mark indication</p>
A radial follower is one	<p>1. That reciprocates in the guides</p> <p>2. that oscillates</p> <p>3. in which the follower translates along an axis passing through the cam centre of rotation</p> <p>4. translates</p>
<p>This is the theoretically exact size from which limits of size are determined:</p>	<p>1. Actual Size</p> <p>2. Dimensioned size</p> <p>3. Production size</p> <p>4. Basic size</p>
offset is provided to a cam follower mechanism to	<p>1. minimise the side thrust</p> <p>2. accelerate</p> <p>3.</p>

Questions	Choices
	<p>avoid jerk</p> <p>4.</p> <p>reduced the noise</p>
<p>Acceptable parts must not extend beyond this:</p>	<p>1. Boundary limits</p> <p>2.Hole limits 3. Specification</p> <p>4. Tolerances</p>
<p>This practice considers an individual part's dimensions and tolerances and that part's relation to its related parts:</p>	<p>1. Applying allowances</p> <p>2. Geometric dimensioning and tolerancing</p> <p>3. Creating datum references</p> <p>4. Angular dimensioning tolerances</p>
<p>These weld symbols have no arrow-side or other-side significance:</p>	<p>1. Projection or seam weld</p> <p>2. Back or backing weld</p> <p>3. Surface or groove weld</p> <p>4. Flash and upset weld</p>
<p>Welding drawings are a special type of this kind of drawing:</p>	<p>1. Symbol</p> <p>2. Perspective</p> <p>3. Assembly</p> <p>4. Isometric</p>
<p>For a low and moderate speed engines, the cam follower should move</p>	<p>1. uniform velocity</p> <p>2.</p>

Questions	Choices
with	<p>simple harmonic motion</p> <p>3. uniform acceleration and retardation</p> <p>4. cycloidal motion</p>
The typical parts list should include the _____	<p>1. part number</p> <p>2. manufacturing material</p> <p>3. number of parts needed</p> <p>4. all of the above</p>
For high speed engines, the cam and follower should move with	<p>1. uniform velocity</p> <p>2. simple harmonic motion</p> <p>3. uniform acceleration and retardation</p> <p>4. cycloidal motion</p>
The title block used on working drawings should include the _____	<p>1. sheet number</p> <p>2. line type</p> <p>3. layer set</p> <p>4. all of the above</p>
The text used on a typical detail sheet should be	<p>1. placed horizontally</p> <p>2. in bold text</p> <p>3. in an architectural text style</p>

Questions	Choices
	4. none of the above
<p>In an exploded assembly drawing it is customary for the drafter to use a _____ line to illustrate how parts fit together.</p>	<p>1. Phantom</p> <p>2. hidden</p> <p>3. dashed</p> <p>4. center</p>
<p>which of the following displacement diagrams should be chosen for better dynamic performance of cam follower motion</p>	<p>1. simple harmonic motion</p> <p>2. parabolic motion</p> <p>3. cycloidal motion</p> <p>4. tangent</p>
<p>It is customary for the first sheet of a working drawing set to include _____</p>	<p>1. a parts list</p> <p>2. exploded assembly</p> <p>3. assembled assembly</p> <p>4. all of the above</p>
<p>The thread note for a typical bolt will include the _____</p>	<p>1. major diameter of the thread</p> <p>2. material</p> <p>3. center line</p> <p>4. offset distance</p>
<p>A combination of kinematic pairs, joined in such a way that the relative motion between the linkage is completely</p>	<p>1. structure</p> <p>2. mechanism</p> <p>3. linkage</p>

Questions	Choices
constrained is called as	<p>kinematic chain</p> <p>4.</p> <p>inversion</p>
The mechanism forms a structure, when the number of degree of freedom is equal to	<p>1. 0</p> <p>2.</p> <p>1</p> <p>3.</p> <p>2</p> <p>4.</p> <p>-1</p>
In a four bar chain or quadric cycle	<p>1. each of the four pairs is turning pair</p> <p>2. one is a turning pair and three sliding pairs</p> <p>3. three are turning pairs and one is sliding pair</p> <p>4. all are sliding pairs</p>
This is an angled surface used on cylinders to make them easier to handle:	<p>1. Fillet</p> <p>2. Taper</p> <p>3. Chamfer</p> <p>4. Lug</p>
These are used to attach parts to a cylinder so they won't turn on it:	<p>1. Lugs and bearings</p> <p>2. Keyseats and bearings</p> <p>3. Knurls and keys</p> <p>4. Keys and keyways/keyseats</p>

Questions	Choices
<p>This is a flat or rounded tab protruding from a surface, usually to provide a method for attachment:</p>	<p>1. Lug 2. Boss 3. Chamfer 4. Spotface</p>
<p>This is a hollow cylinder that is often used as a protective sleeve or guide or as a bearing:</p>	<p>1. Lug 2. Bushing 3. Chamfer 4. Knurl</p>
<p>The total number of instantaneous centres for a mechanism consisting of n links are</p>	<p>1. $n/2$ 2. n 3. $(n-1)/2$ 4. $[n(n-1)]/2$</p>
<p>The two parallel and coplanar shafts are connected by gears having parallel teeth to the axis of the shaft. the arrangement is called</p>	<p>1. spur gearing 2. helical gearing 3. bevel gearing 4. spiral gearing</p>
<p>An imaginary circle which by pure rolling action gives the same motion as the actual gear is called</p>	<p>1. addendum circle 2.</p>

Questions	Choices
	<p>dedendum circle</p> <p>3. pitch circle</p> <p>4. clearance circle</p>
which of the following is incorrect relationship for gears	<p>1. circular pitch X diametral pitch = 3.14</p> <p>2. module = pcd/No of teeth</p> <p>3. dedendum = 1.157 module</p> <p>4. addendum = 2.157 module</p>
Cam size depends on	<p>1. base circle</p> <p>2. prime circle</p> <p>3. outer circle</p> <p>4. pitch circle</p>
The maximum value of pressure angle in case of cam is kept as	<p>1. 10 degree</p> <p>2. 20 degree</p> <p>3. 14 degree</p> <p>4. 30 degree</p>
Consider the following pairs 1. pair of gear in mesh 2. belt and pulley 3. cylinder and piston 4. cam and follower Among these, the higher pairs are	<p>1. 1,2 and 4</p> <p>2. 1,2 and 3</p> <p>3. 2 and 4</p> <p>4. 1 and 4</p>
A cam mechanism imparts following motion	<p>1. oscillating</p> <p>2. reciprocating</p> <p>3. rotating</p> <p>4. all of these options</p>
The contact ratio for gear is	<p>1. 0</p> <p>2. 1</p> <p>3. less than 1</p> <p>4. more than 1</p>
The type of gears used to connect two non parallel and non intersecting shafts is	<p>1. Helical gear</p> <p>2. Bevel gear</p> <p>3. Spur gear</p> <p>4. Spiral gear</p>

Questions	Choices
Angular acceleration of a link can be determined by dividing the	1. velocity 2. centrepetal component of acceleration with length of link 3. tangential component of acceleration with length of link 4. resultant with link length
The Kutzbach criterion for determining the number of degrees of freedom (n) is (where l = number of links, j = number of joints and h = number of higher pairs)	1. $n = 3(l-1)-3j-h$ 2. $n = 2(l-1)-3j-h$ 3. $n = 3(l-1)-2j-h$ 4. $n = 2(l-1)-2j-h$
Any point on a link connecting double slider chain will trace a	1. straight line 2. circle 3. parabola 4. ellipse
The coriolis component of acceleration leads the sliding velocity by	1. 45° 2. 180° 3. 90° 4. 135°
which of the gear train is used for higher velocity ratios in small space?	1. reverted gear train 2. epicyclic gear train 3. compound gear train 4. simple gear train
In ideal machines, mechanical advantage is _____ velocity ratio.	1.none of these options 2.equal to 3.less than 4.greater than
In order to draw the acceleration diagram, it is necessary to determine the Coriolis component of acceleration in the case of	1. pantograph 2. crank and slotted lever quick return mechanism 3. four bar mechanism 4. slider-crank mechanism
which of the gear train is used for higher velocity ratios in small space?	1. reverted gear train 2. epicyclic gear train 3. compound gear train 4. simple gear train
A term used to describe the concept of perfect form at MMC is	1. datum reference frame 2. the envelope principle 3. departure from MMC 4.

Questions	Choices
	None of the above
Which of the following is descriptive of the datum reference frame?	1. six degrees of freedom 2. located based on the functionality of the part 3. three orthogonal planes 4. all of the above
A vast majority of functional gages are made to check _____ tolerances	1. position 2. runout 3. circularity 4. flatness
In establishing datums and datum features the bottom surface of a part is called the _____ and the surface plate is called the _____.	1. datum, datum feature 2. datum feature, datum 3. datum control, datum feature 4. none of the above
Maximum material condition (MMC) is the condition with which a part will	1. weigh the least 2. weigh the most 3. have the straightest and flattest elements 4. have its largest allowable tolerance
For practical purposes, any inspection instrument will be considered as "perfect" if it is at least _____ more	1. 5 times 2.

Questions	Choices
accurate than the part being measured.	<p>10 times</p> <p>3.</p> <p>50 times</p> <p>4.</p> <p>100 times</p>
The number of variables used in locating a part in space are referred to as	<p>1.</p> <p>three degrees of freedom</p> <p>2.</p> <p>four degrees of freedom</p> <p>3.</p> <p>six degrees of freedom</p> <p>4.</p> <p>eight degrees of freedom</p>
Which symbol is used to indicate a dimension refers to the diameter of a hole?	<p>1.</p> <p>R</p> <p>2.</p> <p>O</p> <p>3.</p> <p>\emptyset</p> <p>4.</p> <p>W</p>
In _____ dimensioning, a datum is established for each Cartesian coordinate direction.	<p>1.</p> <p>baseline</p> <p>2.</p> <p>symmetric</p> <p>3.</p> <p>hole basis</p> <p>4.</p> <p>none of the above</p>
In current ANSI/ASME standards, a _____ is indicated by a 'V' shaped symbol	<p>1.</p> <p>counterbore</p> <p>2.</p> <p>datum surface</p> <p>3.</p> <p>countersink</p> <p>4.</p> <p>drill</p>

Questions	Choices
<p>A limited length or area (such as a polished end of shaft) is indicated with a _____ line.</p>	<p>1. hidden 2. Chain 3. Section 4. Dimension</p>
<p>As per standards, a blind hole dimension would have to contain which designation?</p>	<p>1. DP 2. THRU 3. C'BORE 4. CSK</p>
<p>As per standards, a clearance hole dimension would have to contain which designation?</p>	<p>1. DP 2. THRU 3. C'BORE 4. CSK</p>
<p>The _____ of an external feature is the upper limit.</p>	<p>1. maximum material condition 2. runnout 3. minimum material condition 4. allowance</p>
<p>The _____ of an internal feature is the upper limit.</p>	<p>1. maximum material condition 2. runnout 3.</p>

Questions	Choices
	<p>minimum material condition</p> <p>4. allowance</p>
<p>The total amount a dimension may vary and is the difference between the maximum and minimum limits is called _____</p>	<p>1. tolerance</p> <p>2. limits</p> <p>3. fit</p> <p>4. offset</p>
<p>The type of fit that occurs when two toleranced mating parts are sometimes an interference fit and sometimes a clearance fit when assembled.</p>	<p>1. intervention fit</p> <p>2. clearance fit</p> <p>3. transition fit</p> <p>4. geometric fit</p>
<p>A titleblock contains all of the following information, except:</p>	<p>1. name and address of the company</p> <p>2. parts list</p> <p>3. drawing sheet size letter designation</p> <p>4. drawing number</p>
<p>An assembly drawing normally consists of all of the following pieces, except:</p>	<p>1. parts drawn in their operating position</p> <p>2. detail numbers of the parts</p> <p>3. engineering change orders</p> <p>4. bill of materials</p>
<p>Which fastening method uses the shape of the components</p>	<p>1.</p>

Questions	Choices
to hold them together.	mechanical fastening 2. bonding 3. forming 4. none of the above
What is the tool used to form external threads?	1. crest 2. die 3. chamfer 4. tap
What defines the distance a screw will travel when rotated 360 degrees?	1. crest 2. root 3. pitch 4. lead
All of the following are part of the English thread specification, except:	1. thread form 2. major diameter 3. tap drill 4. class of fit
All of the following are part of a metric thread specification, except:	1. general purpose tolerance 2. pitch 3. nominal size

Questions	Choices
	<p>4. thread series</p>
<p>Which type of threaded fastener was designed to prevent rotation between parts?</p>	<p>1. bolt 2. set screw 3. stud 4. cap screw</p>
<p>All of the following are part of the basic weld symbol, except:</p>	<p>1. weld temperature 2. leader line and arrow 3. dimensions 4. tail</p>
<p>When constructing an assembly model using 3-D solid modeling software, the assembly model normally begins with</p>	<p>1.a feature 2.an instance 3.a sub component 4.a base component</p>
<p>In solid modeling software, defining the geometric relations between components in a 3-D assembly model is primarily done with _____ and _____ tools.</p>	<p>1. feature & coordinate plane 2. mate & align 3. instance & component 4. parallel & perpendicular</p>
<p>What is Maximum Material Condition for Hole_____ and Pin_____?</p>	<p>1. 0.515, 0.500 2. 0.500,0.515 3.</p>

Questions	Choices
	0.515,0.495 4. 0.540,0.495
What is the LMC for Hole _____ and Pin _____ ?	1. 0.515, 0.495 2. 0.540, 0.495 3. 0.515, 0.500 4. 0.495, 0.540
What is the geometric tolerance for Hole _____ and Pin _____ ?	1. 0.1, 0.05 2. 0.01, 0.005 3. 0.005,0.01 4. 0.1,0.5
What material condition modifier is specified in the above figure for Hole _____ and Pin _____ ?	1. MMC, LMC 2.LMC, MMC 3.MMC, MMC 4. LMC, LMC
What datum feature(s) control(s) perpendicularity for Hole _____ and Pin_____ ?	1. A,B 2. A,A 3. B,B 4. None of the above
What datum feature(s) control(s) location for Hole _____ and Pin_____ ?	1. B&C, B&C 2. A&C, B&C 3.

Questions	Choices
	B&C, A&C 4. A&C,A&C
Conventional representation of Aluminium and its alloys are illustrated as	1. 2. 3. 4.
Conventional representation of Lead, Zinc, Tin are illustrated as	1. 2. 3. 4.
Conventional representation of cork, linoleum are illustrated as	1. 2. 3. 4.
Conventional representation of a mixture of cement, sand and gravel is illustrated as	1. 2. 3. 4.
What is the conventional representation of the figure	1.

Questions	Choices
shown in figure below.	2. 3. 4. None of the above
What is the conventional representation of the figure shown in figure below	1. 2. 3. 4.
What is the conventional representation of the figure shown in figure below	1. 2. 3. 4.
What is the conventional representation of the figure shown in figure below	1. 2. 3. 4.
What is the conventional representation of spur gear?	1. 2. 3. 4.

Questions	Choices
This type of section is limited by a break line:	1. Removed section 2. Revolved section 3. Broken-out section 4. Half section
If a client of yours is having difficulty visualizing a design, what type of drawing would be the easiest to understand?	1. axonometric 2. three-view orthographic 3. one-view orthographic 4. bimetric
Which of the following is not a pictorial drawing?	1. isometric 2. multiview 3. perspective 4. axonometric
In a flange coupling, the flanges are coupled together by means of	1. studs 2. bolts and nuts 3. headless taper bolts 4. none of these options.
A transmission shaft includes	1. over head shaft 2. line shaft 3. counter shaft 4. all of these options
Slenderness ratio is the ratio of	1. maximum size of column to minimum size of column 2. width of column to depth of column 3. effective length of column to least radius of gyration of the column 4. effective length of column to width of column

Questions	Choices
Each screen point is referred to as	1. Resolution 2. Pixel 3. Persistence 4. Dot Pitch
Which of the following line algorithms used integer only arithmetic to rasterize lines?	1. Bresenham's Line Algorithm 2. DDA Line Algorithm 3. FFTW Line Algorithm 4. All the answer
The purpose of refreshing a CRT is	1. To avoid flickering 2. To maintain steady picture 3. To avoid fading of pixels 4. All the answer
Which of the following is not an object-space hidden surface removal algorithm?	1. Back-Face Culling 2. Depth Buffer 3. Painter's Algorithm 4. All the answer
CAD programs which incorporate parametric modeling utilize a system in which the dimensions control the _____.	1. colouring 2. size and shape of the model features 3. perspective of the model 4. shading used to render the model

Questions	Choices
During the execution of a CNC part program block NO20 G02 X45.0 Y25.0 R5.0 the type of tool motion will be	1. linear Interpolation 2. circular Interpolation - counter clockwise 3. circular Interpolation – clockwise 4. rapid feed
The default position of the UCS icon is positioned at _____ on the AutoCAD grid.	1. 0,0,0 2. 10,10,10 3. 20,20,20 4. -10,-10,-10
CAD programs which incorporate parametric modeling utilize a system in which the dimensions control the _____.	1. colouring 2. size and shape of the model features 3. perspective of the model 4. shading used to render the model
The advantage of implementing CAD is to	1. Expertise in the area of data base manufacturing management 2. Increase productivity 3. Improve communication 4. Increase quality of design
In a CNC machine tool, encoder is used to sense and control	1. spindle speed 2. table velocity 3. spindle position 4. coolant flow
Interpolation in the controller refers to control of which one of the following in a CNC machine?	1. Loading/unloading of jobs on machine 2. Axes of machine for contouring 3. Coolant and miscellaneous functions on machine 4. Loading/unloading of tools from the tool changer
Feed drives in CNC milling machines are provided by	1. synchronous motors 2. induction motors 3. stepper motors 4. servo-motors.
During the execution of a	1. linear Interpolation

Questions	Choices
CNC part program block NO20 G02 X45.0 Y25.0 R5.0 the type of tool motion will be	2. circular Interpolation - counter clockwise 3. circular Interpolation – clockwise 4. rapid feed
The basic transformations include	1. Translation 2. Rotation 3. Scaling 4. All the answer
The transformation in which an object is moved in a minimum distance path from one position to another is called	1. Rotation 2. Replacement 3. Translation 4. Scaling
Forming products of transformation matrices is often referred as	1. Concatenation 2. Composition 3. both a&b 4. only a
The combines the volumes occupied by overlapping 3D objects using set operations	1. CSG method 2. B-rep method 3. Sweep representation 4. All the answer
..... is created by revolution of a circle about	1.

Questions	Choices
an axis lying in its plane.	<p>Sphere</p> <p>2. Ellipsoid</p> <p>3. Torus</p> <p>4. Cylinder</p>
The point about which an object is rotated is called	<p>1. Fixed point</p> <p>2. Central point</p> <p>3. Pivot point</p> <p>4. None</p>
A surface of revolution is generated by a of a 2D curve.	<p>1. Translational sweep</p> <p>2. Rotational sweep</p> <p>3. union</p> <p>4. intersection</p>
Identify line clipping algorithms from the following	<p>1. Cohen- Sutherland algorithm</p> <p>2. Liang-Barsky clipping</p> <p>3. Nicholl-Lee-Nicholl clipping</p> <p>4. All the answer</p>
The transformation in which the dimension of an object are changed relative to a specified fixed point is called	<p>1. Rotation</p> <p>2. Reflection</p> <p>3. Translation</p>

Questions	Choices
	4. to adjust for misalignments
A bearing is designated by the number 305. It means that a bearing is of	1. Light series with bore of 25 mm 2. medium series with bore of 25 mm 3. Heavy series with bore of 25 mm 4. extra light series with width of 25 mm
The spherical roller bearing can be used for	1. Radial load only 2. axial load only 3. both radial and axial loads 4. to adjust for misalignments
If the centre distance of the mating gears having involute teeth is increased, then the pressure angle	1. increases 2. decreases 3. remains unchanged 4. none of these
Lewis equation in spur gears is applied	1. only to the pinion 2. only to the gear 3. to stronger of the pinion or gear 4. to weaker of the pinion or gear
In helical gears, the distance between similar	1.

Questions	Choices
faces of adjacent teeth along a helix on the pitch cylinders normal to the teeth, is called	<p>normal pitch</p> <p>2.</p> <p>axial pitch</p> <p>3.</p> <p>diametral pitch</p> <p>4.</p> <p>module</p>
The root angle of a bevel gear is equal to	<p>1.</p> <p>pitch angle – addendum angle</p> <p>2.</p> <p>pitch angle + addendum angle</p> <p>3.</p> <p>pitch angle – dedendum angle</p> <p>4.</p> <p>pitch angle + dedendum angle</p>
The contact ratio for gears is	<p>1.</p> <p>zero</p> <p>2.</p> <p>less than one</p> <p>3.</p> <p>greater than one</p> <p>4.</p> <p>none of these</p>
The allowable static stress for steel gears is approximately _____ of the ultimate tensile stress.	<p>1.</p> <p>one-fourth</p> <p>2.</p> <p>one-third</p> <p>3.</p> <p>one-half</p> <p>4.</p> <p>double</p>
When bevel gears having equal teeth and equal pitch angles connect two shafts whose axes intersect at right angle, then they are known as	<p>1.</p> <p>angular bevel gears</p> <p>2.</p> <p>crown bevel gears</p>

Questions	Choices
	3. internal bevel gears 4. mitre gears
When the spiral angle of a bevel gear is zero, it is called as _____	1. crown gear 2. zerol bevel gear 3. meter gear 4. spiral bevel gear
The property of a bearing material which has the ability to accommodate small particles of dust, grit etc., without scoring the material of the journal, is called	1. bondability 2. embeddability 3. comformability 4. fatigue strength
The material used for lining of friction surfaces of a clutch should have coefficient of friction.	1. low 2. high 3. medium 4. zero
In case of a multiple disc clutch, if n_1 are the number of discs on the driving shaft and n_2 are the number of the discs on the driven shaft, then the number of pairs of contact surfaces will be	1. $n_1 + n_2$ 2. $n_1 + n_2 - 1$ 3. $n_1 + n_2 + 1$ 4.

Questions	Choices
	none of these
A jaw clutch is essentially a	1. positive action clutch 2. cone clutch 3. friction clutch 4. disc clutch
Total slip will occur in a belt drive when	1. angle of rest is zero 2. angle of creep is greater than angle of rest 3. angle of rest is greater than angle of creep 4. angle of creep is zero
The basic load rating of a ball bearing is	1. the maximum static radial load that can be applied without deformation of bearing components. 2. the radial load at which 90% of the group of apparently ideal revolutions before the first evidence of failure. 3. the maximum radial load that can be applied during operation without deformation of bearing components. 4. a combination of radial and axial loads that can be applied
The difference between tensions on the tight and slack sides of a belt drive is 3000 N. if the belt speed is 15 m/s, the transmitted power in kW is	1. 45 2. 22.5 3. 90 4. 100

Questions	Choices
<p>The ratio of tension on the tight side to that on the slack side in a flat belt drive is</p>	<ol style="list-style-type: none"> <li data-bbox="827 294 1588 361">1. proportional to the product of coefficient of friction and lap angle <li data-bbox="827 384 1588 451">2. an exponential function of the product of coefficient of friction and lap angle <li data-bbox="827 473 1588 541">3. proportional to the lap angle <li data-bbox="827 563 1588 631">4. proportional to the coefficient of friction
<p>A 1.5 kW motor is running at 1440 rev/min, it is to be connected to a stirrer running at 36 rev/min. The gearing arrangement suitable for this application is</p>	<ol style="list-style-type: none"> <li data-bbox="827 669 1588 736">1. Differential gear <li data-bbox="827 759 1588 826">2. helical gear <li data-bbox="827 848 1588 916">3. spur gear <li data-bbox="827 938 1588 1006">4. worm gear
<p>The property of a material which enables it to resist fracture due to high impact loads is known as</p>	<ol style="list-style-type: none"> <li data-bbox="827 1057 1588 1125">1. Elasticity <li data-bbox="827 1147 1588 1215">2. endurance <li data-bbox="827 1237 1588 1304">3. strength <li data-bbox="827 1327 1588 1394">4. toughness
<p>If a load W is applied instantaneously on a bar, then the stress induced in bar will</p>	<ol style="list-style-type: none"> <li data-bbox="827 1446 1588 1513">1. Be independent of ration of mass of load W to mass of bar <li data-bbox="827 1536 1588 1603">2. increase with increase in γ <li data-bbox="827 1626 1588 1693">3. decrease with decrease in γ <li data-bbox="827 1715 1588 1783">4. dependent on other considerations
<p>If a material fails below its yield point, failure would be due to</p>	<ol style="list-style-type: none"> <li data-bbox="827 1792 1588 1859">1. Straining <li data-bbox="827 1882 1588 1949">2. fatigue <li data-bbox="827 1971 1588 2039">3.

Questions	Choices
	<p>creep</p> <p>4.</p> <p>impact loading</p>
<p>In testing a material for endurance strength, it is subjected to</p>	<p>1.</p> <p>Static load</p> <p>2.</p> <p>dynamic load</p> <p>3.</p> <p>impact load</p> <p>4.</p> <p>completely reversed load</p>
<p>Guest's theory of failure is applicable for following type of materials</p>	<p>1.</p> <p>Brittle</p> <p>2.</p> <p>ductile</p> <p>3.</p> <p>elastic</p> <p>4.</p> <p>plastic.</p>
<p>With the percentage increase of carbon in steel</p>	<p>1.</p> <p>Strength of steel decreases</p> <p>2.</p> <p>hardness of steel decrease</p> <p>3.</p> <p>brittleness of steel decrease</p> <p>4.</p> <p>ductility of steel decrease</p>
<p>The maximum percentage of carbon content in cast iron is _____.</p>	<p>1.</p> <p>2%</p> <p>2.</p> <p>6.67%</p> <p>3.</p> <p>5%</p> <p>4.</p> <p>4.8 %</p>

Questions	Choices
In most machine members, the damping capacity of the material should be	1. Low 2. zero 3. high 4. could be anything
Stress concentration is caused due to	1. variation in properties of material from point to point in a member 2. areas at which loads on a member are applied 3. Abrupt change of section 4. all of the above.
Resilience of a material is important, when it is subjected to	1. Fatigue 2. thermal stress 3. wear and tear 4. shock loading.
Factor of safety is the ratio of	1. Yield stress / working stress 2. tensile stress / working stress 3. compressive stress / working stress 4. bearing stress / working stress.
Slow plastic deformation of metals under a constant stress is known as	1. Creep 2. fatigue 3. endurance

Questions	Choices
	4. Plastic deformation
<p>Two solid circular shafts of radii R_1 and R_2 are subjected to same torque. The maximum shear stresses developed in the two shafts are 1 t and 2 t . If $R_1/R_2=2$, then 2 t / 1 t is _____.</p>	<p>1. 10</p> <p>2. 8</p> <p>3. 15</p> <p>4. 20</p>
<p>A solid circular shaft of 60 mm diameter transmits a torque of 1600 N.m. The value of maximum shear stress developed is</p>	<p>1. 37.72 MPa</p> <p>2. 47.72 MPa</p> <p>3. 57.72 MPa</p> <p>4. 67.72 MPa</p>
<p>A solid shaft of diameter, d length and length L is fixed at both ends. A torque, T_o is applied at a distance $L/4$ from the left end. The maximum shear stress in the shaft is</p>	<p>1. $16T_o/\pi d^3$</p> <p>2. $12T_o/\pi d^3$</p> <p>3. $8T_o/\pi d^3$</p> <p>4. $4T_o/\pi d^3$</p>
<p>A solid circular shaft needs to be designed to transmit a torque of 50 Nm. If the allowable shear stress of the material is 140 MPa, assuming a factor of safety of 2, the minimum allowable design diameter in mm is</p>	<p>1. 8 mm</p> <p>2. 16 mm</p> <p>3. 24 mm</p> <p>4. 32 mm</p>
The piston rod and the crosshead in a steam	1.

Questions	Choices
engine are usually connected by means of	<p>Cotter joint</p> <p>2.</p> <p>Knuckle joint</p> <p>3.</p> <p>Ball joint</p> <p>4.</p> <p>Universal joint</p>
Square key of side " $d/4$ " each and length l is used to transmit torque "T" from the shaft of diameter "d" to the hub of a pulley. Assuming the length of the key to be equal to the thickness of the pulley, the average shear stress developed in the key is given by	<p>1.</p> <p>$4T/Id$</p> <p>2.</p> <p>$16T/Id^2$</p> <p>3.</p> <p>$8T/Id^2$</p> <p>4.</p> <p>$16T/Id^3$</p>
A 60 mm long and 6 mm thick fillet weld carries a steady load of 15 kN along the weld. The shear strength of the weld material is equal to 200 MPa. The factor of safety is	<p>1.</p> <p>2.4</p> <p>2.</p> <p>3.4</p> <p>3.</p> <p>4.8</p> <p>4.</p> <p>6.8</p>
A spur gear transmitting power is connected to the shaft with a key of rectangular section. The type (s) of stresses developed in the key is fare.	<p>1.</p> <p>Shear stress alone</p> <p>2.</p> <p>bearing stress alone</p> <p>3.</p> <p>Both shear and bearing stresses</p> <p>4.</p> <p>shearing, bearing and bending stresses .</p>
In a fillet welded joint, the weakest area of the weld is	<p>1.</p> <p>Toe</p> <p>2.</p> <p>root</p> <p>3.</p>

Questions	Choices
	<p>throat</p> <p>4. face</p>
<p>A double fillet welded joint with parallel fillet weld of length L and leg B is subjected to a tensile force P. Assuming uniform stress distribution, the shear stress in the weld is given by</p>	<p>1. 2P/ B.L</p> <p>2. P/3.B.L</p> <p>3. P/2.B.L</p> <p>4. 3P/ B.L</p>
<p>The bolts in a rigid flanged coupling connecting two shafts transmitting power are subjected to</p>	<p>1. Shear force and bending moment</p> <p>2. axial force</p> <p>3. Torsion and bending moment</p> <p>4. torsion</p>
<p>A clutch has outer and inner diameters 100 mm and 40 mm respectively. Assuming a uniform pressure of 2 MPa and coefficient of friction of liner material 0.4, the torque carrying capacity of the clutch is</p>	<p>1. 148 Nm</p> <p>2. 196 Nm</p> <p>3. 372 Nm</p> <p>4. 490 Nm</p>
<p>Total slip will Occur in a belt drive when</p>	<p>1. Angle of rest is zero</p> <p>2. Angle of creep is zero</p> <p>3. Angle of rest is greater than angle of creep</p> <p>4. Angle of creep is greater than angle of rest</p>

Questions	Choices
<p>Which one of the following is not a friction clutch?</p>	<ol style="list-style-type: none"> <li data-bbox="827 294 1092 361">1. Disc or plate clutch <li data-bbox="827 384 997 451">2. Cone clutch <li data-bbox="827 473 1076 541">3. Centrifugal clutch <li data-bbox="827 563 975 631">4. Jaw clutch
<p>Which one of the following belts should not be used above 40°C?</p>	<ol style="list-style-type: none"> <li data-bbox="827 687 975 754">1. Balata belt <li data-bbox="827 777 986 844">Rubber belt <li data-bbox="827 866 975 934">3. Fabric belt <li data-bbox="827 956 1017 1024">4. Synthetic belt
<p>Which type of gear is used for shaft axes having an offset?</p>	<ol style="list-style-type: none"> <li data-bbox="827 1080 975 1147">1. Mitre gears <li data-bbox="827 1170 1065 1237">2. Spiral bevel gears <li data-bbox="827 1260 1006 1327">Hypoid gears <li data-bbox="827 1349 975 1417">4. Zerol gears
<p>When two shafts are neither parallel nor intersecting, power can be transmitted by using</p>	<ol style="list-style-type: none"> <li data-bbox="827 1473 1097 1540">1. A pair of spur gears <li data-bbox="827 1563 1113 1630">2. a pair of helical gears <li data-bbox="827 1653 1129 1720">An Oldham's coupling <li data-bbox="827 1742 1097 1810">4. a pair of spiral gears
<p>In the formulation of Lewis equation for toothed gearing, it is assumed that tangential tooth load F_t, acts on the</p>	<ol style="list-style-type: none"> <li data-bbox="827 1866 975 1933">1. Pitch point <li data-bbox="827 1956 1029 2023">tip of the tooth

Questions	Choices
	3. Root of the tooth 4. whole face of the tooth
<p>If reduction ratio of about 50 is required in a gear drive, then the most appropriate gearing would be</p>	1. spur gears 2. bevel gears 3. Double helical gears 4. worm and worm wheel
<p>The shearing area of a key of length 'L', breadth 'b' and depth 'h' is equal to</p>	1. $b \times h$ 2. $L \times h$ 3. $L \times b$ 4. $L \times (h/2)$
<p>Consider the following statements: A splined shaft is used for 1. Transmitting power 2. Holding a flywheel rigidly in position 3. Moving axially the gear wheels mounted on it 4. Mounting V-belt pulleys on it. Of these statements</p>	1. 2 and 3 are correct 2. 1 and 4 are correct 3. 2 and 4 are correct 4. 1 and 3 are correct
<p>In the welded joint shown in the given figure, if the weld at B has thicker fillets than that at A, then the load carrying capacity P, of the joint will</p>	1. increase 2. decrease 3. remain unaffected 4. exactly get doubled

Questions	Choices
<p>Which of the following stresses are associated with the design of pins in bushed pin-type flexible coupling?</p> <p>1. Bearing stress 2. Bending stress 3. Axial tensile stress 4. Transverse shear stress Select the correct answer using the codes given below</p>	<p>1. 1, 3 and 4</p> <p>2. 2, 3 and 4</p> <p>3. 1, 2 and 3</p> <p>4. 1, 2 and 4</p>
<p>The angle of twist for a transmission shaft is inversely proportional to</p>	<p>1. Shaft diameter</p> <p>2. $(\text{Shaft diameter})^2$</p> <p>3. $(\text{Shaft diameter})^3$</p> <p>4. (Shaft diameter)⁴</p>
<p>A muff coupling is</p>	<p>1. rigid coupling</p> <p>2. flexible coupling</p> <p>3. shock absorbing coupling</p> <p>4. none of these</p>
<p>The maximum shear stress in the spring is induced at</p>	<p>1. inner surface of the coil</p> <p>2. outer surface of the coil</p> <p>3. central surface of the coil</p> <p>4. end coils</p>
<p>When a helical spring is cut into two halves, the stiffness of each spring will be</p>	<p>1. same as original spring</p> <p>2.</p>

Questions	Choices
	<p>double of original spring</p> <p>3. half of original spring</p> <p>4. one fourth of original spring</p>
<p>Fatigue failure results due to fluctuating stresses when the stress magnitude is</p>	<p>1. more than ultimate tensile strength</p> <p>2. more than yield strength but lower than the ultimate tensile strength</p> <p>3. lower than yield strength</p> <p>4. none of these</p>
<p>Rankine theory of failure is applicable to</p>	<p>1. ductile materials</p> <p>2. elastic materials</p> <p>3. brittle materials</p> <p>4. plastic materials</p>
<p>Distortion energy theory of failure is applicable to</p>	<p>1. component made of plain carbon steel</p> <p>2. component made of composites</p> <p>3. component made of cast iron</p> <p>4. component made of non-metals</p>
<p>Griffith's law states that fracture strength of brittle material is</p>	<p>1. directly proportional to the square root of the crack length</p> <p>2. inversely proportional to the square root of the crack length</p> <p>3. directly proportional to the square of the crack length</p>

Questions	Choices
	4. inversely proportional to the square of the crack length
Flat head rivets are used in	1. ship hulls 2. light sheet metal work 3. structural work 4. air conditioning ducts
Maximum shear stress theory is used for	1. cast iron shafts 2. steel shafts 3. flexible shafts 4. plastic shafts
Resilience of a material is important, when it is subjected to	1. Fatigue 2. thermal stress 3. wear and tear 4. shock loading
Stress concentration in static loading is more serious in	1. Ductile materials 2. brittle materials 3. equally serious in both cases 4. unpredictable
Bushed pin flexible coupling is used to joint two	1.

Questions	Choices
shafts which	<p>have lateral misalignment.</p> <p>2. whose axes intersect at a small angle</p> <p>3. are not in exact alignment</p> <p>4. all of the above</p>
The sleeve or muff coupling is designed as a	<p>1. thin vessel.</p> <p>2. solid shaft.</p> <p>3. hollow shaft.</p> <p>4. continuous shaft.</p>
Following type of pipe joint is mostly used for pipes carrying water at low pressures	<p>1. socket.</p> <p>2. union.</p> <p>3. spigot and socket.</p> <p>4. sleeve and cotter.</p>
For two parallel shafts, the distance between whose axes is small and variable, which coupling will you use?	<p>1. hydraulic coupling</p> <p>2. universal coupling</p> <p>3. flange coupling</p> <p>4. oldham's coupling.</p>
The trap end of the a connecting rod of steam engine is joined by	<p>1. gib of cotter joint</p> <p>2. sleeve and cotter joint</p> <p>3.</p>

Questions	Choices
	knuckle joint 4. universal joint
Which of the following pipe joints would be suitable for pipes carrying steam	1. flanged 2. threaded 3. bell & spigot 4. expansion joint
Universal coupling is used to join two shafts	1. have lateral misalignment. 2. whose axes intersect at a small angle 3. are not in exact alignment. 4. all of the above
The most important dimension in the design of nut is	1. outside diameter of nut 2. inside diameter 3. height 4. pitch diameter.
The valve rod in a steam engine is connected to an eccentric rod by	1. cotter joint 2. bolted joint 3. knuckle joint 4. universal coupling
Strain energy is the	1.

Questions	Choices
	energy stored in a body when strained within elastic limits
The object of caulking in a riveted joint is to make the joint	1.free from corrosion 2.stronger in tension 3.free from stresses 4. leakproof
A steel bar of 5 mm is heated from 15°C to 40°C and it is free to expand. The bar Will induce	1. no stress 2.shear stress 3.tensile stress 4.compressive stress
A body is subjected to a tensile stress of 1200 MPa on one plane and another tensile stress of 600 MPa on a plane at right angles to the former. It is also subjected to a shear stress of 400 MPa on the same planes. The maximum normal stress will be	1. 400 MPa 2.500 MPa 3.900 MPa 4. 1400 MPa
A body is subjected to a tensile stress of 1000 MPa on one plane and another tensile stress of 500 MPa on a plane at right angles to the former. It is also subjected to a shear stress of 250 MPa on the same planes. The maximum normal stress will be	1. 1000 MPa 2. 1100 MPa 3. 1200 MPa 4. 1300 MPa
A body is subjected to a tensile stress of 1000 MPa on one plane and another tensile stress of -1000 MPa on a plane at right angles to the former. It is also	1. 250 MPa

Questions	Choices
subjected to no shear stress on any planes. The maximum shear stress will be	2. 500 MPa 3. 750 MPa 4. 1000 MPa
CAD programs which incorporate parametric modeling utilize a system in which the dimensions control the _____.	1. colouring 2. size and shape of the model features 3. perspective of the model 4. shading used to render the model
CAD programs which incorporate parametric modeling utilize a system in which the dimensions control the _____.	1. colouring 2. size and shape of the model features 3. perspective of the model 4. shading used to render the model
Which of the following operating systems is used with CAD systems?	1. LINUX 2. all the answers 3. UNIX 4. DOS
With incremental tool positioning, _____.	1. each tool movement is made with reference to the last tool position 2. all tool movement is measured from a fixed point or origin 3. all tool movement is measured from a zero point 4. No tool Movement
The point-to-point NC movement system _____.	1. permits controlled tool travel along one axis at a time 2. is used for operations performed at a fixed location in terms of a two-dimensional coordinate system 3. precisely controls machine and tool movement at all times and in all three dimensions 4. All the answers

Questions	Choices
A straight-cut system ____.	1. permits controlled tool travel along one axis at a time 2. is used for operations performed at a fixed location in terms of a two-dimensional coordinate system 3. precisely controls machine and tool movement at all times and in all three dimensions 4. permits controlled tool travel along three axis at a time
When the contour or continuous path system is used, ____.	1. tool travel is controlled along one axis at a time 2. machine and tool movements are precisely controlled at all times and in all three dimensions 3. tool movement from one point to the next does not have to follow a straight line 4. No movement of tool
With contour or continuous path NC movement system, ____.	1. cutter size and other variables must be considered when the program is written 2. cutter location is monitored continuously 3. cutting is continuous and can be in six axes simultaneously 4. All of the answers
In a CAD package, mirror image of a 2D point P (5, 10) is to be obtained about a line which passes through the origin and makes an angle of 45° counterclockwise with the X-axis. The coordinates of the transformed point will be	1. (7.5, 5) 2. (10, 5) 3. (7.5, -5) 4. (10, -5)
The shape of the Bezier curve is controlled by:	1. Control points 2. Knots 3.

Questions	Choices
	End points 4. All of the answers
The degree of the B-spline with varying knot vectors:	1. Increases with knot vectors 2. Decreases with knot vectors 3. Remains constant 4. No influence with knot vectors
IGES stands for	1. Initial Graphics Exchange System 2. Initial Graphics Exchange Software 3. Initial Graphic Exchange Solution 4. Initial Graphics Exchange Specification
B-Rep is a methods of _____	1. Solid modeling 2. Surface modeling 3. Wire frame modeling 4. 2D modeling
The tool of an NC machine has to move along a circular arc from (5, 5) to (10,10) while performing an operation. The centre of the arc is at (10, 5). Which one of the following NC tool path commands performs the above mentioned operation?	1. N010G02 X10 Y10 X5 Y5 R5 2. N010G03 X10 Y10 X5 Y5 R5 3. N010G01 X5 Y5 X10 Y10 R5 4. N010G02 X5 Y5 X10 Y10 R5
What are the main components of an NC machine?	1.

Questions	Choices
1. Part program 2. Machine Control Unit 3. Servo meter	<p>1, 2 and 3</p> <p>2. 1 and 2 only</p> <p>3. 2 and 3 only</p> <p>4. 1 and 3 only</p>
<p>Which of the following are the rules of programming NC machine tools in APT language?</p> <p>1. only capital letters are used 2. A period is placed at the end of each statement 3. Insertion of space does not affect the APT word</p>	<p>1. 1 and 2</p> <p>2. 2 and 3</p> <p>3. 1 and 3</p> <p>4. 1 alone</p>
<p>Which of the following are valid statements for point to point motion of the tool in APT language?</p> <p>1. GOTO/..... 2. GO DLTA/..... 3. GO/TO,</p>	<p>1. 1 and 2</p> <p>2. 2 and 3</p> <p>3. 1 and 3</p> <p>4. 1, 2 and 3</p>
<p>The stress induced in a body, when suddenly loaded, is _____ the stress induced when the same load is applied gradually.</p>	<p>1.equal to</p> <p>2. one-half</p> <p>3.twice</p> <p>4.four times</p>
<p>The bending moment at a point on a beam is the algebraic _____ of all the moments on either side of the point.</p>	<p>1. sum</p> <p>2. difference</p> <p>3. multiplication</p>

Questions	Choices
<p>The deformation per unit length is called</p>	<p>4. division</p> <p>1.tensile stress 2.compressive stress 3.shear stress 4.strain</p>
<p>A thin cylindrical shell of diameter (d) and thickness (t) is subjected to an internal pressure (p). The ratio of longitudinal strain to volumetric strain is</p>	<p>1. $\frac{m - 1}{2m - 1}$ 2. $\frac{2m - 1}{m - 1}$ 3. $\frac{m - 2}{3m - 4}$ 4. $\frac{m - 2}{5m - 4}$</p>
<p>In the torsion equation $\frac{T}{J} = \frac{\tau}{R} = \frac{C\theta}{l}$ the term J/R is called</p>	<p>1.shear modulus 2.section modulus 3.polar modulus 4. Young's modulus</p>
<p>Strain resetters are used to</p>	<p>1.measure shear strain 2.measure linear strain 3.measure volumetric strain 4.</p>

Questions	Choices
	relieve strain
The torque transmitted by a solid shaft of diameter (D) is (where τ = Maximum allowable shear stress)	1. $\frac{\pi}{16} \times \tau \times D^3$
When a rectangular cantilever beam is loaded transversely, the maximum compressive stress is developed on the	1.top layer 2.bottom layer 3.neutral axis 4.every cross-section
When a rectangular simply supported beam is loaded transversely, the maximum compressive stress is developed on the	1.every cross-section 2.bottom layer 3.neutral axis 4.top layer
When a rectangular cantilever beam is loaded transversely, the maximum tensile stress is developed on the	1.top layer 2.bottom layer 3.neutral axis 4.every cross-section
When a machine member is subjected to torsion, the torsional shear stress set up in the member is	1. zero at the centroidal axis and maximum at the outer surface of the member 2. maximum at the centroidal axis and zero at the outer surface of the member 3. maximum at both the centroidal axis and outer surface of the member 4. zero at both the centroidal axis and outer surface of the member
A shaft is subjected to fluctuating loads for which the normal torque (T) and bending moment (M) are 1000 N-m and 500 N-m respectively. If the combined shock and fatigue factor for bending is 1.5 and combined shock and fatigue factor for torsion is 2, then the equivalent twisting moment for the shaft	1.2050 N-m 2. 2136 N-m 3.2000 N-m 4.2100 N-m

Questions	Choices
is	
The value of stress concentration factor depends upon	1. material of the part 2. geometry of the part 3. material and geometry of the part 4. none of these options
Stress concentration is caused due to	1. abrupt change of cross-section 2. variations in properties of materials in a member 3. variations in load acting on a member 4. all of these options
When a machine member is subjected to torsion, the torsional shear stress set up in the member is	1. zero at the centroidal axis and maximum at the outer surface of the member 2. maximum at the centroidal axis and zero at the outer surface of the member 3. maximum at both the centroidal axis and outer surface of the member 4. zero at both the centroidal axis and outer surface of the member
The strain energy stored in a spring, when subjected to maximum load, without suffering permanent distortion, is known as	1. impact energy 2. modulus of resilience 3. proof resilience 4. proof stress
A rod of length L having uniform cross-sectional area A is subjected to a tensile force P. If the Young's modulus of the material varies linearly from E1 to E2 (Given that; E1>E2) along the length of the rod, the normal stress developed at the mid section of the beam is	1. $[P(E_1-E_2)]/[A(E_1+E_2)]$ 2. $P E_2 / A E_1$ 3. P/A 4. $P E_1 / A E_2$
The bending stress in a beam is _____ section modulus.	1. directly proportional to 2. not directly proportional to 3. not inversely proportional to 4. inversely proportional to
Two identical circular rods of same diameter and same length are subjected to same magnitude of axial tensile force. One of the rods is made out of mild steel having the modulus of elasticity of 206 GPa. The other rod is made out of cast iron having the modulus of elasticity of 100 GPa. Assume both the materials to be homogeneous and isotropic and the axial force causes the same amount of uniform stress in both the rods. The stresses developed are within the proportional limit of the respective materials. Which of the following observations is correct?	1. As the stresses are equal strains are also equal in both the rods 2. Mild steel rod elongates more than the cast iron rod 3. Both rods elongate by the same amount 4. Cast iron rod elongates more than the mild steel rod
In a sample of water an increase of pressure by 18 MN/m ² caused 1% reduction in the volume. The bulk modulus of elasticity of this sample, in MN/m ² is	1. 1.8 2. 180 3. 1800 4. 0.18

Questions	Choices
If the principal stresses in a plane stress problem, are 100MPa, and 40MPa, the magnitude of the maximum shear stress (in MPa) will be	1. 20 MPa 2. 10 MPa 3. 40 MPa 4. 30 MPa
Which of these factors doesn't affect the stress of a wire?	1. diameter 2. load 3. original length 4. cross sectional area
Stress concentration is caused due to	1. variation in properties of material from point to point in a member 2. abrupt change of section 3. pitting at points or areas at which loads on a member are applied 4. all of these
Which of the following is not a basic type of strain?	1. Shear strain 2. Volume strain 3. Compressive strain 4. Area strain
Which bearing is best for space constraint?	1. journal bearing 2. needle bearing 3. roller bearing 4. thrust bearing
A thin cylinder of inner radius 500mm and thickness 10mm is subjected to an internal pressure of 5MPa. The average circumferential (hoop) stress in MPa is	1. 750 2. 500 3. 250 4. 1000
A disk clutch is required to transmit 5 kW at 2000 rpm. The disk has a friction lining with coefficient of friction equal to 0.25. Bore radius of friction lining is equal to 25 mm. Assume uniform contact pressure of 1 MPa. The value of outside radius of the friction lining is	1. 39.4 mm 2. 49.5 mm 3. 97.9 mm 4. 142.9 mm
When shear force at a point is zero, then bending moment is _____ at that point.	1. zero 2. minimum 3. maximum 4. infinity
A clutch has outer and inner diameters 100 mm and 40 mm respectively.	1. 148 N m

Questions	Choices
Assuming a uniform pressure of 2MPa and coefficient of friction of liner material is 0.4, the torque carrying capacity of the clutch is	2. 196 N m 3. 372 N m 4. 490 N m
The clutch used in scooter is	1. multi plate clutch 2. single plate clutch 3. centrifugal clutch 4. cone clutch
Match List-I with List-II and select the correct answer using the codes given below the lists: List-I List-II A. Single-plate friction clutch 1. Scooters B. Multi-plate friction clutch 2. Rolling mills C. Centrifugal clutch 3. Trucks D. Jaw clutch 4. Mopeds	1. 1 3 4 2 2. 1 3 2 4 3. 3 1 2 4 4. 3 1 4 2
The commonly used angle between leather or asbestos friction lining surface and axis of cone clutch for a cone clutch is	1. 14.5 2. 20 3. 12.5 4. 45

Questions	Choices
<p>In a band brake the ratio of tight side band tension to the tension on the slack side is 3. If the angle of overlap of band on the drum is 180°, the coefficient of friction required between drum and the band is</p>	<ol style="list-style-type: none"> <li data-bbox="827 294 906 361">1. 0.20 <li data-bbox="827 384 906 451">2. 0.25 <li data-bbox="827 473 906 541">3. 0.30 <li data-bbox="827 563 906 631">4. 0.35
<p>In block brakes, the ratio of shoe width and drum diameter is kept between</p>	<ol style="list-style-type: none"> <li data-bbox="827 705 986 772">1. 0.1 to 0.25 <li data-bbox="827 795 986 862">2. 0.25-0.50 <li data-bbox="827 884 986 952">3. 0.50-0.75 <li data-bbox="827 974 986 1042">4. 0.75-1.0
<p>Fabric belts are used in industrial applications because</p>	<ol style="list-style-type: none"> <li data-bbox="827 1125 1049 1192">1. they are cheap <li data-bbox="827 1215 1335 1282">2. they can work at high temperature <li data-bbox="827 1304 1526 1372">3. they are unaffected by moisture and humidity <li data-bbox="827 1394 1097 1462">4. none of the above
<p>The power transmitted by the belt drive can be increased by</p>	<ol style="list-style-type: none"> <li data-bbox="827 1545 1414 1612">1. increasing the initial tension in the belt <li data-bbox="827 1635 1573 1702">2. dressing the belt to increase the coefficient of friction <li data-bbox="827 1724 1478 1792">3. increasing wrap angle by using idler pulley <li data-bbox="827 1814 1192 1882">4. all of the above methods
<p>In a 6×20 wire rope, No.6 indicates the</p>	<ol style="list-style-type: none"> <li data-bbox="827 1965 859 2010">1.

Questions	Choices				
	<p>diameter of the wire rope in mm</p> <p>2.</p> <p>Number of strands in the wire rope</p> <p>3.</p> <p>Number of wires</p> <p>4.</p> <p>Gauge number of the wire</p>				
<p>In a flat belt drive the belt can be subjected to a maximum tension T and centrifugal tension T_c. What is the condition for transmission of maximum power?</p>	<p>1. $T=T_c$</p> <p>2. $T=4T_c$</p> <p>3. $T=2T_c$</p> <p>4. $T=3T_c$</p>				
<p>Interference between the teeth of two meshing involute gears can be reduced or eliminated by</p> <p>1. Increasing the addendum of the gear teeth and correspondingly reducing the addendum of the pinion.</p> <p>2. Reducing the pressure angle of the teeth of the meshing gears.</p> <p>3. Increasing the centre distance</p> <p>Which of the statements given above is/are correct?</p>	<p>1. 1 and 2</p> <p>2. 2 and 3</p> <p>3. 1 only</p> <p>4. 3 only</p>				
<p>Match List-I with List-II and select the correct answer using the codes given below the lists: List-I List-II</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">A. Undercutting</td> <td style="width: 50%;">1. Beam strength</td> </tr> <tr> <td>B. Addendum</td> <td>2. Interference</td> </tr> </table>	A. Undercutting	1. Beam strength	B. Addendum	2. Interference	<p>1. 2 5 1 3</p> <p>2. 1 5 4 3</p> <p>3. 1 3 4 5</p> <p>4.</p>
A. Undercutting	1. Beam strength				
B. Addendum	2. Interference				

Questions	Choices
<p>C. Lewis equation reduction</p> <p>D. Worm and wheel axes</p> <p style="text-align: center;">5. Module</p>	2 3 1 5
<p>The dynamic load capacity of 6306 bearing is 22 kN. The maximum radial load it can sustain to operate at 600 rev/min, for 2000 hours is</p>	<p>1. 4.16 kN</p> <p>2. 3.60 kN</p> <p>3. 6.25 kN</p> <p>4. 5.29 kN</p>
<p>In sliding contact bearings, a positive pressure can be built up and a load supported by a fluid only by the use of a:</p>	<p>1. Diverging film</p> <p>2. Converging-diverging film</p> <p>3. Converging film</p> <p>4. Flat film</p>
<p>Assertion (A): In hydrodynamic journal bearings, the rotating journal is held in floating condition by the hydrodynamic pressure developed in the lubricant.</p> <p>Reason (R): Lubricant flows in a converging-diverging channel.</p>	<p>1. Both A and R are individually true and R is the correct reason for A.</p> <p>2. Both A and R are individually true but R is not the correct reason for A.</p> <p>3. A is true but R is false</p> <p>4. A is false but R is true</p>
<p>The steering of a ship means</p>	<p>1. movement of a complete ship up and down in vertical plane above or below the water surface</p> <p>2. turning of a complete ship in a curve towards right or left, while moving forward</p> <p>3. tilting of a complete ship</p> <p>4. rolling of a complete ship side-ways</p>

Questions	Choices
<p>What are the upper and lower limits of the shaft represented by 60f8?</p> <p>Use the following data</p> <p>Diameter step is 50 - 80mm.</p> <p>Fundamental tolerance unit $i=0.45D^{(1/3)} + 0.001D$, where D is the representative size in mm, Tolerance value for IT8 = 25i,</p> <p>Fundamental deviation for f shaft = $-5.5D^{0.41}$</p>	<p>1. Upper and lower limits = 59.97mm</p> <p>2. Lower limit = 59.924mm</p> <p>Upper limit = 60.000mm</p> <p>3. Upper limit = 60.046mm</p> <p>Lower limit = 59.970</p> <p>4. None of the answers are correct</p>
<p>What does N, P and L mean in N.P.L. Gauge interferometer?</p>	<p>1. Nikon pulsed laser</p> <p>2. Nuclear plasma laboratory</p> <p>3. National Physics Laboratory</p> <p>4. Nuclear physics laboratory</p>
<p>According to Taylor's principle which type of gauge checks both size and geometric features?</p>	<p>1. GO gauge</p> <p>2. NOGO gauge</p> <p>3. Snap gauge</p> <p>4. None of the options are correct</p>
<p>What effect does pitch error have on nut and bolt?</p>	<p>1. Major diameter of nut decreases and effective diameter of bolt increases</p> <p>2. Effective diameter of nut decreases and effective diameter of bolt increases</p> <p>3. Effective diameter of nut increases and effective diameter of bolt decreases</p> <p>4. None of the options are correct</p>
<p>What is ten point height method?</p>	<p>1. It is the average sum of ten highest points measured within sampling length</p> <p>2.</p>

Questions	Choices
	<p>It is the average difference of five highest points and five deepest values.</p> <p>3. It is the sum of ten highest points divided by sum of ten deepest values.</p> <p>4. None of the options are correct</p>
<p>Which type of surface in a fringe pattern exhibits the movement of fringes towards the centre?</p>	<p>1. Convex</p> <p>2. Concave</p> <p>3. Flat</p> <p>4. Circular</p>
<p>At which angle does a glass plate reflector set in N.P.L. interferometer?</p>	<p>1. 45 degrees</p> <p>2. 90 degrees</p> <p>3. 35.5 degrees</p> <p>4. 85.5 degrees</p>
<p>Which type of deviation is observed while calculating hole dimensions?</p>	<p>1. positive</p> <p>2. Negative</p> <p>3. Zero</p> <p>4. All the options are correct</p>
<p>The snap gauge having go dimension corresponds to _____</p>	<p>1. MMC</p> <p>2. MMMC</p> <p>3. LMC</p> <p>4. LMMC</p>

Questions	Choices
<p>Find the missing term in the equation which represents the standard tolerance unit.</p>	<ol style="list-style-type: none"> <li data-bbox="827 294 917 354">1. 0.005D <li data-bbox="827 377 917 437">2. 0.001D <li data-bbox="827 460 917 521">3. 0.056D <li data-bbox="827 543 917 604">4. 0.0012D
<p>As the size of a part to be manufactured increases, the tolerance limits within which the part can be manufactured _____</p>	<ol style="list-style-type: none"> <li data-bbox="827 669 917 729">1. increases <li data-bbox="827 752 917 813">2. decreases <li data-bbox="827 835 917 896">3. remains unaltered <li data-bbox="827 918 917 979">4. None of the options are correct
<p>What description of fit suits the vacant box?</p>	<ol style="list-style-type: none"> <li data-bbox="827 1044 917 1105">1. Normal running fit <li data-bbox="827 1127 917 1188">2. loose fit <li data-bbox="827 1210 917 1271">3. tight fit <li data-bbox="827 1293 917 1354">4. interference fit
<p>Describe the fit in relation to the following data</p>	<ol style="list-style-type: none"> <li data-bbox="827 1419 917 1480">1.Slight clearance <li data-bbox="827 1547 917 1608">2. No clearance <li data-bbox="827 1630 917 1691">3. Slightly tight <li data-bbox="827 1713 917 1774">4. none of the options are correct
<p>What type of fit does the following description represent?</p>	<ol style="list-style-type: none"> <li data-bbox="827 1837 917 1897">1. Clearance fit <li data-bbox="827 1920 917 1980">2. transition fit <li data-bbox="827 2003 917 2064">3.

Questions	Choices
	Interference fit 4. wide fit
What is the value of the fundamental tolerance unit "i" for the shaft and hole pair designated by	1. 0.7327micro meter 2. 0.7327milli meter 3. 0.3727micro meter 4. 0.3727milli meter
The figure given below represents the disposition of tolerance zone around the zero line Find the Min. Clearance and Max. Clearance	1. Min. Clearance 24 micrometer and Max. Clearance 4 micrometer 2. Min. Clearance 24 mm and Max. Clearance 4 mm 3. Max. Clearance 24 micrometer and Min. Clearance 4 micrometer 4. Min. Clearance 42 mm and Max. Clearance 24 mm
Internal diameter of any workpiece can be measured using _____	1. Solex pneumatic comparator 2. Sigma comparator 3. Johansson microcator 4. None of these options
Which among the following is measured using four ball method?	1. Diameter 2. Length 3. angle 4. radius
Match the following Group 1 items (Type of error) with Group 2 items (characteristics) and	1.

Questions	Choices
<p>select the correct option</p> <p>1. Gross error -----A. Magnitude and direction vary 2. Systematic error -----B. Caused by electrostatic fields 3. Random error -----C. Human fault 4. Environmental error -----D. Magnitude and direction are definite</p>	<p>1-B, 2-A, 3-D, 4-C 2. 1-A, 2-C, 3-D, 4-B 3. 1-C, 2-D, 3-A, 4-B 4. 1-D, 2-A, 3-B, 4-C</p>
<p>Which of the following is a characteristic of End standard?</p>	<p>1. accuracy of ± 0.2 mm 2. the accuracy of ± 0.050 mm 3. accuracy of ± 0.001 mm 4. accuracy of ± 1.00 mm</p>
<p>Which ISO standard is used in international automobile companies to set automotive quality system standards ?</p>	<p>1. ISO 14000 2. TS 16949 3. TSISO 9000 4. None of the options are correct</p>
<p>ISO 14000 quality standard is related with</p>	<p>1. Eliminating poor quality 2. Environmental management systems 3. Automotive quality standards 4. Customer satisfaction</p>
<p>Which of the following is a contact type of automated inspection method?</p>	<p>1. Laser scanning 2. Electric field 3. Inspection probe</p>

Questions	Choices
	<p>4. None of the options are correct</p>
Which of the following statements is true?	<p>1. In three wire method, each flank of a thread is touched by a wire in only for a thread having rank angle</p> <p>2. Compression error is always subtracted from effective diameter value</p> <p>3. The value of θ is assumed 30° while calculating best wire diameter</p> <p>4. Floating carriage type of micrometer is used for two wire method</p>
Calculate diameter of best wire for a Withworth thread of M 24 x 7 mm size.	<p>1. 3.94mm</p> <p>2. 4.94mm</p> <p>3. 2.03mm</p> <p>4. 8.68mm</p>
Which of the following methods is <u>unreliable</u> to evaluate the surface finish?	<p>1. Electrical stylus profilometer</p> <p>2. Wallace surface dynamometer</p> <p>3. Profilograph</p> <p>4. Tomlinson surface tester</p>
Which principle does Taylor-Hobson-Talysurf tester work on?	<p>1. Capacitive demodulating principle</p> <p>2. Intensity modulating principle</p> <p>3. Inductive modulating principle</p> <p>4. Carrier modulating principle</p>
Which type of light source is used in N.P.L. type of flatness interferometer?	<p>1. Mercury nickel vapour lamp</p>

Questions	Choices
	<p>2. Cadmium and mercury vapour lamp. It depends on the type of the source.</p> <p>3. Cadmium lamp</p> <p>4. Mercury vapour lamp</p>
The closeness of the measured value to the actual value is _____	1. Accuracy 2.Repeatability 3.Sensitivity 4.Precision
Side rake angle of a single point cutting tool is the angle	1.between the surface of the flank immediately below the point and perpendicular to the base 2.by which the face of the tool is inclined to the flank immediately below the point and a plane at right angles to it 4.by which the face of the tool is inclined sideways
A measurement system only includes operators and gauges	1. Always True 2. Can't predict 3. False 4. May be true or false
Precision is related to the accuracy of the measurements	1. Always False 2. May be true or false 3. True 4. can't predict
This is a solid shape that fits inside the mold and forms a hole in a cooled cast metal or molten plastic object:	1. Core 2. Cavity 3. Prototype 4. Hole mold
When a metal is specified as "tough" in the part drawing, the manufacturing engineer should understand that this metal:	1. resists being broken or deformed by mechanical shock forces 2. dulls tools almost immediately 3. does not deform plastically but breaks into pieces when stressed 4. resists grinding
Which of the following is the best engineering plastics material that has high tensile strength, high compressive strength, with minimal elongation to use for a product that will be injection molded?	1. polycarbonate 2. polystyrene 3. phenolic 4. epoxy
The best process for making a kitchen drawer divider tray out of plastic sheets is:	1. pultrusion 2. thermoforming 3. compression forming 4. blow molding
A turning operation is to be done on a piece of alloy steel that has a diameter of 90mm. If the depth of cut is set at 3.175 mm, the feed is set at 0.30 mm per revolution, and the recommended cutting speed using a carbide tool is 90 meters per minute, what	1. 218 2. 118 3. 418 4. 318

Questions	Choices
rotational speed you will set on the machine, from the following available speeds on machine, in rpm?	
In foundry work, a runner is which one of the following:	1. channel in the mold leading from the downspurte to the main mold 2. none of the options 3. vertical channel into which the metal is poured into the mold from 4. foundryman who moves the hot molten metal from the furnace to
Total solidification time is defined as which one of the following: (a) time between pouring and complete solidification, (b) time between pouring and cooling to room temperature, (c) time between solidification and cooling to room temperature, or (d) time to give up the heat of fusion?	1. (d) time to give up the heat of fusion 2. (c) time between solidification and cooling to room temperature 3. (b) time between pouring and cooling to room temperature 4. (a)time between pouring and complete solidification
In a sand-casting mold, the V/A ratio of the riser should be	1. none of these options 2. smaller than the V/A ratio of the casting itself 3. greater than the V/A ratio of the casting itself 4. equal to the V/A ratio of the casting itself
In a sand-casting mold, the V/A ratio of the riser should be	1. none of these options 2. smaller than the V/A ratio of the casting itself 3. greater than the V/A ratio of the casting itself 4. equal to the V/A ratio of the casting itself
In sand casting, the volumetric size of the pattern is	1. bigger than the cast part 2. same size as the cast part 3. smaller than the cast part 4. none of these options
Given that W_m = weight of the molten metal displaced by a core and W_c = weight of the core, the buoyancy force is which one of the following?	1. downward force = $W_m - W_c$ 2. downward force = $W_m + W_c$ 3. upward force = $W_m + W_c$ 4. upward force = $W_m - W_c$
Which of the following materials require largest shrinkage allowance while making a pattern for a casting?	1. Plain Carbon steel 2. Cast Iron 3. Brass 4. Aluminum
Shrinkage allowance on pattern is provided to compensate for shrinkage when	1. temperature of liquid metal drops from pouring to freezing temperature 2. metal changes from liquid state to solid state at freezing temperature 3. temperature of metal drops from pouring to room temperature 4. temperature of solid phase drops from freezing temperature to room temperature
In sand molding, core prints are used to	1. all of these options 2. strengthen the core so that it will not crumble while pouring 3. form seat to support and hold the core in place 4. fabricate the core

Questions	Choices
In sand molding draft is provided on the	1. casting 2. pattern 3. none of these options 4. cavity
In a casting process, fluidity is mostly influenced by	1. solidification temperature 2. pouring temperature 3. tapping temperature 4. melting temperature
Sprue in sand casting refers to	1. vertical passage 2. gate 3. runner 4. riser
The purpose of sprue is to	1. act as a reservoir for molten metal 2. help feed the casting until the solidification takes place 3. feed molten metal from pouring basin to gate 4. feed the cavity at a rate consistent with the rate of solidification
In sand mold, the purpose of gate is to	1. feed the cavity at a rate consistent with the rate of solidification 2. act as a reservoir for molten metal 3. feed molten metal from pouring basin to the gate 4. help feed the casting until all solidification takes place
The purpose of riser is to	1. feed molten metal from pouring basin to gate 2. help feed the casting until solidification takes place 3. feed the cavity at a rate consistent with the rate of solidification 4. act as a reservoir for molten metal
In sand molding there is no need to provide one of the following allowance, it is	1. distortion allowance 2. draft allowance 3. Shrinkage allowance 4. machining allowance
The purpose of chaplets in a mould is to	1. to support the core 2. compensate for shrinkage from pouring temperature to freezing temperature 3. provide venting 4. induce directional solidification
In metrology, a feeler gauge is used to check	1. Radius 2. Screw pitch 3. Surface roughness 4. Thickness of clearance
In surface roughness measurements, the term "secondary texture" represents _____	1. Lay direction 2. Flaw 3. roughness 4. Waviness
Tomlinson's surface meter and Taylor Hobson Talysurf are _____ instruments	1. surface roughness measuring 2. Surface waviness measuring 3. lay direction measuring 4. none of these

Questions	Choices
Slip gauges are _____ standards	1. wave length 2. secondary 3. end 4. Line
Dial gauge is a _____	1. Angular measuring instrument 2. None of these 3. Surface measuring instrument 4. linear measuring instrument
Among the various terminologies related to surface roughness, 'Ra' represents _____	1. Roughness average 2. sampling length 3. Root Mean square value 4. Mean roughness depth
The least measurement that can be detected by a measuring instrument is _____	1. calibration 2. Precision 3. accuracy 4. Sensitivity
The closeness of the measured value to the actual value is _____	1. Repeatability 2. Precision 3. Sensitivity 4. Accuracy
The comparators eliminate the _____	1. need for machining 2. surface roughness 3. surface waviness 4. Measuring time
The scientist 'Carl Edvard Johansson' invented _____	1. Surface table 2. Slip gauges 3. Sine bar 4. Comparators
Primary standards are kept at all leading industries across the globe	1. - 2. - 3. True 4. False
The closeness among the measured value is _____	1. Repeatability 2. Precision 3. Accuracy 4. Calibration
In metrology, angular measurements are made using _____	1. Sine bar and slip gauges 2. Slip gauge alone 3. surface plates and sl
_____ is equal to the differences of the two limits of size of the part	1. a) Tolerance 2. b) Low limit 3. c) High limit

Questions	Choices
	4. d) Design size
The amount by which the actual size of a shaft is less than the actual size of mating hole in an assembly _____ is the basis of interferometry	1. a) Clearance 2. b) Interference 3. c) Allowance 4. d) None of the options
A 1.5mm surface is being measured on an interferometer. A lamp is used which can emit wave lengths as follows. Red: 0.842 μm , Blue: 0.6628 μm . What are the nominal fractions expected for the gauge for the two wave lengths?	1. a) Monochromatic light source 2. b) Halogen lights 3. c) High intensity flash lights 4. d) None of the options
Cylindricity measurement comes under the category of _____	1. b) For Blue light, $N_f = 0.3568$ For red light, $N_f = 1.2589$ 2. a) For Blue light, $N_f = 0.2222$ For red light, $N_f = 0.9999$ 3. c) For Blue light, $N_f = 0.2523$ For red light, $N_f = 0.9454$ 4. d) For Blue light, $N_f = 0.2666$ For red light, $N_f = 35.9454$
"Piston -profile tester" is an instrument to check _____	1. a) Form measurement 2. b) linear measurement 3. c) surface measurement 4. d) alignment testing
NO-GO gauge checks the _____	1. c) Piston minor diameter 2. a) Piston ovality 3. b) Piston major diameter 4. d) All the options are correct
GO gauge checks the _____	1. d) Least material condition 2. c) Both maximum and least material condition 3. b) Maximum material condition 4. a) None of the answers are correct
In unilateral tolerance system, the gauge tolerance zones lie entirely within the _____	1. Least material condition 2. Both maximum and least material condition 3. Maximum material condition 4. None of the answers are correct
	1. d) none of the options are correct 2. c) gauge tolerance zone t 3. b) work tolerance zone

Questions	Choices
Which option given here is not the limitations/disadvantages of limit gauges	<p>4. a) maximum tolerance zone</p> <p>1. a) Do not indicate the actual size of the component 2. d) None of the options are correct 3. c) Conveniently used in mass production for controlling various dimensions</p> <p>4. b) Require frequent checking of gauge dimensions</p>
Which option given here is not the advantages of limit gauges	<p>1. b) Require frequent checking of gauge dimensions 2. c) Economical in its own cost as well as engaging cost.</p> <p>3. d) None of the options are correct 4. a) Conveniently used in mass production for controlling various dimensions</p>
Reference gauges are also known as _____	<p>1. b) Master gauges 2. d) Work gauges 3. c) GO- gauges</p> <p>4. a) limit gauges</p>
_____ may be used to check the contour of a profile of work piece for conformance to certain shape.	<p>1. d) snap gauges 2. a) taper gauges 3. b) form gauges 4. c) thread gauges</p>
A template gauge comes under the category of _____	<p>1. a) thread gauges 2. b) form gauges 3. d) none of the options are correct 4. c) taper gauges</p>
The tool maker's microscope is based on the principle of _____	<p>1. c) TEMSEM 2. d) SEMTEM 3. b) OPTICS 4. a) SEMITEM</p>
A collimator is a device that narrows a beam of particles or waves	<p>1. c) Partially true 2. b) False 3. a) True 4. d) None of the options</p>
Inter-changeability is the ability to select components for assembly at random and fit them together within proper tolerances	<p>1. d) None of the options 2. c) True</p> <p>3. a) partially true 4. b) false</p>
. In a lathe, to check the Parallelism of the Main Spindle to Saddle Movement, we conduct	<p>1. a) form test 2. b) alignment test 3. c) taper test</p>

Questions	Choices
<hr/>	4. d) parallel test
An _____ interferometer is a device in which two or more light waves are combined together to produce interference <hr/>	1. c) Level 2. b) diametric 3. a) Magnetic 4. d) None of the options are correct
A screw thread measurement involves <hr/>	1. a) major diameter 2. b) thread form 3. c) thread pitch 4. d) all the options are correct
2-wire and 3-wire methods measure <hr/>	1. a) effective thread length 2. b) shape of the bold head 3. c) Diameter of the bolt head 4. d) Effective diameter of screw thread
Calibration is performed to _____	1. d) None of the options are correct 2. c) fix the size of the equipment and to promote easy machining 3. b) to ascertain the accuracy of the instrument's reading 4. a) clean the equipment for dust and water
What a calibration certificate contains	1. d) All the options are correct 2. c) it is an unambiguous statement of the results, including an un 3. b) it uniquely identifies the instrument and its owner 4. a) it establishes the identity and credibility of the calibrating labo
Gauge blocks are a system for producing precision lengths	1. c) Partially true 2. b) False 3. a) True 4. d) Sometimes true
An important feature of gauge blocks is that they can be joined together with very little dimensional uncertainty	1. a) False 2. c) True 3. d) sometimes true 4. b) Partially true
The _____ on thickness of tooth is the variation of actual thickness of tooth from its theoretical value	1. a) Permissible error 2. b) tolerance value 3. c) both permissible error / tolerance value are correct 4. d) transverse value
Why Micrometer carries a ratchet stop?	1.

Questions	Choices
	<p>Ratchet stop applies uniform pressure on the measuring faces.</p> <p>2. Ratchet stop develops uniform temperature irrespective of operator.</p> <p>3. Ratchet stop protects the instrument from dust</p> <p>4. Ratchet stop protects the instrument from acoustic troubles</p>
<p>What are the reasons behind false reading on Micrometer while taking measurements?</p>	<p>1. There is zero error in Micrometer.</p> <p>2. Dirty work piece or measuring faces of micrometer.</p> <p>3. Taking measurement when the job is moving</p> <p>4. All the options are reasons</p>
<p>Mention the features of a Universal Bevel Protractor?</p>	<p>1. Minimum reading is 5 minutes.</p> <p>2. Fine adjustment of the blade insures the precision measuring</p> <p>3. Main parts are of hardened stainless steel to prevent rusting</p> <p>4. All the options are features</p>
<p>An eutectoid steel consists of</p>	<p>1. wholly pearlite</p>

Questions	Choices
	2. wholly austenite 3. pearlite and ferrite 4. pearlite and cementite
Shock resisting steels should have	1. low wear resistance 2. low hardness 3. low tensile strength 4. toughness
Cast iron is a	1. ductile material 2. malleable material 3. brittle material 4. tough material
The hardness is the property of a material due to which it	1. can be drawn into wires 2. breaks with little permanent distortion 3. can cut another metal 4. can be rolled or hammered into thin sheets
Malleable cast iron is produced	1. by adding magnesium to molten cast iron 2. by quick cooling of molten cast iron 3. from white cast iron by annealing process 4.

Questions	Choices
	none of these
The percentage of carbon in cast iron varies from	1. 0.1 to 0.5 2. 0.5 to 1 3. 4. 1.7 to 4.5
Brass is an alloy of	1. copper and zinc 2. copper and tin 3. copper, tin and zinc 4. none of these
A material is said to be allotropic, if it has	1. fixed structure at all temperatures 2. atoms distributed in random pattern 3. different crystal structures at different temperatures 4. any one of the above
Closed packed hexagonal space lattice is found in	1. zinc, magnesium, cobalt, cadmium, antimony and bismuth 2. gamma-iron, aluminium, copper, lead, silver and nickel 3. alpha-iron, tungsten, chromium and molybdenum 4. none of the above
The hardness and tensile strength in austenitic stainless steel can be increased by	1. hardening and cold working 2. normalising 3.

Questions	Choices
	martempering 4. full annealing
<p>The quenching of steel from the upper critical point results in a fine grained structure.</p>	1. Agree 2. Disagree 3. 4.
<p>When the steel is normalised, its</p>	1. yield point increases 2. ductility decreases 3. ultimate tensile strength increases 4. all of these
<p>The lower critical point for all steels is</p>	1. 600°C 2. 700°C 3. 723°C 4. 913°C
<p>The material in which the atoms are arranged regularly in some directions but not in others, is called</p>	1. mesomorphic material 2. crystalline material 3. none of these 4. amorphous material
<p>Iron-carbon alloys containing 1.7 to 4.3% carbon are known as</p>	1. eutectic cast irons 2. hypo-eutectic cast irons 3.

Questions	Choices
	hyper-eutectic cast irons 4. none of these
The hardness of steel increases if it contains	1. pearlite 2. ferrite 3. cementite 4. martensite
In full annealing, the hypo-eutectoid steel is heated from 30° C to 50° C above the upper critical temperature and then cooled	1. in still air 2. slowly in the furnace 3. suddenly in a suitable cooling medium 4. any one of these
The lower critical temperature	1. decreases as the carbon content in steel increases 2. increases as the carbon content in steel increases 3. is same for all steels 4. depends upon the rate of heating
Which of the following is an amorphous material?	1. Mica 2. Silver 3. Lead 4. Glass
Preheating of parent metal plates before welding is	1. prevent cold cracks 2. burn away oil, grease, etc from the plate surface

Questions	Choices
done to	3. make the steel softer 4. prevent plate distortions
Metal better weldable with itself is	1. stainless steel 2. copper 3. bronze 4. mild steel
Metal which can be suitable welded by TIG welding is	1. aluminum 2. pure titanium 3. stainless steel 4. all of these options
Main advantage of MIG welding (GMAW) over TIG welding is that	1. the former can be used to weld hard metals 2. welding rate is very fast 3. former permits use of large currents thereby allowing higher deposition rates 4. welding is completely automatic
Thermit welding is	1. a process which uses a mixture of iron oxide and granular aluminum 2. a process in which arc is maintained under a blanket of flux 3. accomplished by maintaining a hot molten metal pool between the electrodes 4. not a welding process
Submerged arc welding is	1. a process which uses a mixture of iron oxide and granular aluminum 2. a process in which arc is maintained under a blanket of flux 3. accomplished by maintaining a hot molten metal pool between the electrodes 4. none of these options
Submerged arc welding is	1. a process which uses a mixture of iron oxide and granular aluminum 2. a process in which arc is maintained under a blanket of flux 3. accomplished by maintaining a hot molten metal pool between the electrodes 4. none of these options
In gas welding, maximum temperature occurs at	1. next to the inner cone 2. the inner cone 3. the tip of flame 4. at the outer cone
Temperature of the plasma torch is of the order of	1. 1000 deg C 2. 5000 deg C 3. 10000 deg C 4. 30000 deg C
In reverse polarity welding	1. work is positive and the holder is earthed 2. holder is positive and the work is earthed 3. electrode holder is connected to negative polarity and the work to positive polarity 4. electrode holder is connected to positive polarity and the work to negative polarity
Amperage setting in the electric arc welding (SMAW) depends on	1. work thickness 2. electrode rod diameter 3. arc gap 4. None of the options

Questions	Choices
Consumable electrode is used in the following welding process: -	1. TIG 2. MIG(GMAW) 3. LBM 4. Thermit
Ratio of oxygen to acetylene for complete combustion is	1. 1.5:1 2. 2:1 3. 2.5:1 4. 1:1
If two pieces of different metals are to be welded by projection welding, then the projection should be done on the metal piece having	1. lower conductivity 2. none of the options 3. same conductivity 4. higher conductivity
Multi spot welding is infact a	1. percussion welding 2. thermit welding 3. projection welding 4. seam welding
Material difficult to be spot welded is	1. stainless steel 2. copper 3. mild steel 4. none of these options
In fusion welding, porosity defect is due to	1. poor base metal 2. wrong size of electrode 3. low welding speed 4. high welding speed
Which of the following is the hardest one?	1. Ferrite 2. Cementite 3. Martensite 4. Tempered martensite
What is the major driving force for any phase transformation?	1. Volume change 2. Chemical compositional 3. Free energy reduction

Questions	Choices
	4. None of these
Voltage during the arc-striking compared to the voltage during welding in electric arc welding is	1. same 2. more 3. less 4. unpredictable
Electroslag welding is	1. a process which uses a mixture of iron oxide and granular aluminum 2. accomplished by maintaining a hot molten metal pool between poles 3. there is nothing called electro slag welding 4. a process in which arc is maintained under a blanket of flux
Arc length in an arc welding should be equal to	1. half the diameter of the electrode rod 2. diameter of the electrode rod 3. twice the diameter of the electrode rod 4. 2.5 times the electrode rod diameter
Filler material is essentially used in	1. gas welding 2. spot welding 3. seam welding 4. all of these options
Grey iron is generally welded by	1. arc welding 2. TIG welding 3. MIG welding 4. gas welding
Copper is	1. suitable for spot welding just as another metal 2. very difficult to be spot welded 3. easily spot welded 4. preferred to be welded by spot welding
An example of plastic welding is	1. arc welding 2. gas welding 3. forge welding 4. none of these options
In sintering stage of powder metallurgy, which of the following process take place?	1. all the pores reduce in size 2. the powder particles fuse and join together 3. some of the pores grow 4. Particles do not melt, but a bond is formed between them
In production of precision components, the use of powder metallurgy technique mainly reduces	1. equipment cost 2. machining cost 3. material cost 4. tool-related costs
Widely used metal powder production method for powder metallurgy is	1. crushing using impact 2. liquid metal spray 3. none of these options 4. electrolytic deposition

One of the process used to manufacture crankshafts is	1. cold heading 2. casting 3. pressure die casting 4. investment casting
Most suitable process for manufacturing carburettor body is	1. pressure die casting 2. investment casting 3. casting 4. cold heading
Most suitable process for manufacturing nails is	1. cold heading 2. casting 3. pressure die casting 4. investment casting
Extrusion process can effectively reduce the cost of production through	1. none of these options 2. saving in administrative cost 3. material saving 4. in-process tooling costs
Major problem in hot extrusion is	1. design of die 2. wear and tear of die 3. design of punch 4. wear of punch
Upsetting or cold heading is a	1. bending process 2. forging process 3. rolling process 4. extrusion process
Material good for extrusion is	1. stainless steel 2. low carbon work hardened steel 3. brass casting 4. low carbon annealed steel
Seam less tube can be produced by	1. ring rolling combined with stretch forming 2. piercing 3. steam hammer forging 4. two high rolling mill
A tooth paste tube can be produced by	1. solid backward extrusion 2. hollow forward extrusion 3. solid forward extrusion 4. hollow backward extrusion
Rolling process can not be used to produce	1. a T section bar 2. an I-section bar 3. a channel section bar 4. a hollow circular section
If temperature of a solid surface changes from 300 K to 900 K, then its emissive power changes in the ratio of	1. 3 2. 9

	<p>3. 27</p> <p>4. 81</p>
In a gas turbine cycle, the turbine output is 600 kJ/kg, the compressor work is 400 kJ/kg and the heat supplied is 1000 kJ/kg. The thermal efficiency of this cycle is :	<p>1. 80%</p> <p>2. 60%</p> <p>3. 40%</p> <p>4. 20%</p>
. In an internal combustion engine, during the compression stroke the heat rejected to the cooling water is 50 kJ/kg and the work input is 100 kJ/kg. The change in internal energy of the working fluid is	<p>1. 50 kJ/kg, loss</p> <p>2. 50 kJ/kg, gain</p> <p>3. 0</p> <p>4. 100 kJ/kg, loss</p>
The efficiency of standard Diesel cycle depends on	<p>1. compression ratio in the cycle</p> <p>2. cut-off ratio in the cycle</p> <p>3. cut-off ratio and compression ratio</p> <p>4. mean effective pressure</p>
Which process is included in air standard Diesel cycle?	<p>1. Isochoric and isobaric heat addition</p> <p>2. Isobaric heat addition</p> <p>3. Isochoric heat addition</p> <p>4. Polytropic compression</p>
Which one of the following is part of air standard Brayton cycle?	<p>1. Isochoric heat addition</p> <p>2. Isobaric heat addition</p> <p>3. Isochoric and isobaric heat addition</p> <p>4. Polytropic compression</p>
The mean effective pressure of an engine is defined as	<p>1. work done per cycle/cylinder volume</p> <p>2. work done/stroke volume</p> <p>3. work done per kg/stroke volume</p> <p>4. work done per cycle/stroke volume</p>
An Otto cycle operates with volumes of 40 cm ³ and 400 cm ³ at Top Dead Centre and Bottom Dead Center respectively. If the power output is 100 kW, what is the heat input in kJ/s?	<p>1. 145</p> <p>2. 166</p> <p>3. 93</p> <p>4. 110</p>
A low wet bulb temperature indicates very _____ humidity.	<p>1. high</p> <p>2. low or high depends on other properties</p> <p>3. low</p> <p>4. None of the options</p>
In a turbojet engine, subsequent to heat addition to compressed air, to get the power output, the working substance is expanded in	<p>1. exit nozzle, which is essentially an isentropic process.</p> <p>2. exit nozzle, which is a constant volume process.</p> <p>3. turbine blades, which is essentially an isentropic process.</p> <p>4. turbine blades, which is essentially an isochoric process.</p>

A nozzle is said to have choked flow when	1. Nozzle exit pressure is more than the critical pressure. 2. Discharge is zero. 3. Throat velocity is sonic. 4. Discharge is minimum.
The unit of thermal conductivity is -----.	1. J/mK 2. W/mK 3. 4. W/m ² K
The ratio of heat flow Q_1/Q_2 from two walls of same thickness having their thermal conductivities $K_1 = 2K_2$ will be -----.	1. 0.25 2. 0.5 3. 1 4. 2
Absorptivity of a body equals its emissivity	1. at all temperatures 2. at one particular temperature 3. when system is under thermal equilibrium 4. at critical temperature
The zone of transition between laminar sublayer and turbulent core is called	1. transition zone 2. buffer layer 3. boundary layer 4.

	turbulent layer
Cooling with adiabatic humidification Process is known as	1. Adiabatic chemical dehumidification 2. Evaporative cooling 3. cooling and dehumidification 4. heating and humidification
The volumetric efficiency of compressor with increase in compression ratio will	1. increase 2. remain same 3. none of the above 4. decrease
A two stage compressor takes in air at 1.1. bar and discharges at 20 bar. for minimum compression work, the intermediate pressure is	1. 4.7 bar 2. 7.33 bar 3. 5.5 bar 4. 10.55 bar
In a single stage air-compressor, the clearance volume is 1/19th of the swept volume. It delivers 7.6 m ³ of free air per minute from 100 kpa to 900 kpa. Assume the index of compression and expansion as 1.2. Find the volumetric efficiency of compressor	1. 62.4 % 2. 72.4 % 3. 90.4 % 4. 82.4 %
A 20 m ³ of air per minute is compressed from 1 bar and 20 degree Celsius to 10.24 bar. Calculate the minimum power required to drive the compressor with 2-stage compression. Assume the index of compression is 1.3	1. 88.9 kW 2. 58.8 kW 3. 78.8 kW 4. 68.2 kW
The work input to air compressor is minimum if the compression law followed is	1. $PV^{1.35} = C$ 2. $PV^\gamma = C$ 3. $PV = C$ 4. None of the answers
Find the volumetric efficiency of the compressor if air is compressed from 1 bar to 7 bar. The expansion and compression are isentropic ($n=1.3$)and the clearance volume is 3% of stroke volume.	1. 89.6 % 2. 76.2% 3. 91.5% 4. 85.1%
A mono-atomic ideal gas ($\gamma = 1.67$,molecular weight = 40) is compressed adiabatically from 0.1 MPa, 300 K to 0.2 MPa. The universal gas constant is 8.314 kJ/molK. The work of compression of the gas (in kJ/kg) is	1. 29.7 2. 19.9 3. 13.3 4.

	zero
A gas expands in a frictionless piston-cylinder arrangement. The expansion process is very slow and is resisted by an ambient pressure of the 100 kPa. During the expansion process, the pressure of the system (gas) remains constant at 300 kPa. The change in volume of the gas is 0.01 m ³ . The maximum amount of work that could be utilized from the above process is	<p>1. Zero</p> <p>2. 1 kJ</p> <p>3. 2 kJ</p> <p>4. 3kJ</p>
For a given set of operating pressure limits of a Rankine cycle, the highest efficiency occurs for	<p>1. Saturated cycle</p> <p>2. Superheated cycle</p> <p>3. Reheat cycle</p> <p>4. Regenerative cycle</p>
A football was inflated to a gauge pressure of 1 bar when the ambient temperature was 15°C. When the game started next day, the air temperature at the stadium was 5°C. Assume that the volume of the football remains constant at 2500 cm ³ , the amount of heat lost by the air in the football and the gauge pressure of air in the football at the stadium respectively equal to	<p>1. 30.6 J, 1.94 bar</p> <p>2. 21.8 J, 0.93 bar</p> <p>3. 61.1 J, 1.94 bar</p> <p>4. 43.7 J, 0.93 bar</p>
The property of a system that does not change when the system is undergoing adiabatic process	<p>1. Pressure</p> <p>2. Temperature</p> <p>3.</p>

	<p>Volume</p> <p>4. Quantity of Heat</p>															
<p>A heat engine takes in some amount of thermal energy and performs 50 J of work in each cycle and rejects 150 J of energy. What is its efficiency?</p>	<p>1. 500 %</p> <p>2. 400 %</p> <p>3. 25 %</p> <p>4. 20 %</p>															
<p>A rigid container holds an ideal gas ($C_v = 0.75 \text{ kJ/(kg K)}$). The container is cooled from 110°C to 20°C. Find the specific heat transfer (kJ/kg) for the process</p>	<p>1. 67.5 kJ/ kg</p> <p>2. - 67.5 kJ / kg</p> <p>3. -96 kJ/kg</p> <p>4. 96 kJ/kg</p>															
<p>Match items in List-I (Process) with those in List-II (Characteristic) and select the correct answer using the codes given below the lists:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; width: 33%;">List-</th> <th style="text-align: center; width: 33%;">List-</th> <th style="text-align: center; width: 33%;">List-</th> </tr> <tr> <th style="text-align: center;">I</th> <th style="text-align: center;">II</th> <th style="text-align: center;">III</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">A. Throttling process</td> <td style="text-align: center;">1. No work done</td> <td style="text-align: center;">1.</td> </tr> <tr> <td style="text-align: center;">B. Adiabatic process No heat transfer</td> <td style="text-align: center;">2.</td> <td style="text-align: center;">A B C D</td> </tr> <tr> <td style="text-align: center;">C. Free expansion Constant internal energy</td> <td style="text-align: center;">3.</td> <td style="text-align: center;">4 2 1 3</td> </tr> </tbody> </table>	List-	List-	List-	I	II	III	A. Throttling process	1. No work done	1.	B. Adiabatic process No heat transfer	2.	A B C D	C. Free expansion Constant internal energy	3.	4 2 1 3	<p>1. A B C D</p> <p>2. A B C D</p> <p>3. A B C D</p> <p>4. A B C D</p>
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<p>D. Isothermal process enthalpy</p>	<p>4. Constant</p>	<p>1 3 4 2</p>
<p>Think about how a refrigerator works and the system of the refrigerator and the area outside of the refrigerator at ambient temperature. Is the high temperature the body refrigerator or the ambient air around the refrigerator?</p>	<p>1. Not enough information to answer 2. Provided the refrigerator is working, the refrigerator is the high temperature body 3. Provided the refrigerator is working, the area around the refrigerator is the high temperature body 4. Provided the refrigerator is working, the bodies are of the same temperature</p>	
<p>A rigid vessel contains pure substance and it passes through the critical state on heating only if the initial state is</p>	<p>1. subcooled water 2. wet 3. dry 4. superheated</p>	
<p>The spark advance is usually specified in terms of</p>	<p>1. engine speed in rev/sec 2. piston displacement from TDC 3. time in seconds 4. degree of crank rotation</p>	
<p>In reciprocating compressors, clearance is provided</p>	<p>1. To reduce power consumption of the compressor 2. To accommodate valves 3. To improve the volumetric efficiency of the compressor</p>	

	4. To account for thermal expansion due to temperature variation
The commercial refrigeration system which is closer to reversed carnot cycle in terms of performance is	1. Air refrigeration system 2. cryogenic system 3. vapour absorption cycle 4. Vapour compression cycle
Air ($C_p = 1.0 \text{ kJ/kg}$ ratio of specific heat = 1.4) enters a compressor at a temperature of 27 deg.C. The compressor ratio is 4. Assuming an mechanical efficiency of 80%, the compressor work required in kJ/kg is	1. 172 2. 160 3. 225 4. 182
The latent heat load in an auditorium is 25% of sensible heat load. The value of sensible heat factor(SHF) is equal to	1. 0.25 2. 0.5 3. 0.8 4. 1.0
_____ gives the fraction of air which does not come into contact with heating coil surface	1. latent heat factor 2. total heat factor 3. sensible heat factor 4. By pass factor
Fundamental principle of refrigeration is based on _____ law of thermodynamics	1. First 2. second 3. third 4. none of the above
Humidification or Dehumidification process is also called as	1. sensible heat process 2. all the answers 3. total heat process 4. latent heat process
The air refrigeration system is working on _____ cycle	1. VCR cycle 2. carnot cycle 3. bell column cycle 4. driving cycle
A lubrication system in which a scoop connected at the lowest part of the connecting rod is used to spread the lubricating oil on the cylinder wall is called	1. dry sump system 2. petrol system 3. pressure system 4. splash system
The amount of heat removed from 1 ton (1000 kg) of pure water supplied at 0°C to form ice at 0°C in 24 hours is known as _____	1. One TR 2. 3.5 kW 3. 14000 kJ/hr 4. all the above
A 40 kW engine has a mechanical efficiency of 80 %. If the frictional power is assumed to be constant with load, what is the approximate value of the mechanical efficiency at 50% of the rated load?	1. 77% 2. 57% 3. 47% 4. 67%

A refrigerant should have low	1. specific volume of vapour 2. specific heat of liquid 3. boiling point 4. all of the above
Antiknock character of compression ignition engine fuel is increased by	1. Lead ethide 2. Amyl nitrate 3. Tetra ethyl lead 4. Napthane
In computing the engine performance, the heating value of fuel used is _____	1. The Average of lower and higher heating values 2. Higher heating value 3. Lower heating value 4. None of the above
Superheating in vapour compression refrigeration cycle is	1. Increases work of compression 2. Increases the specific volume of refrigerant vapour 3. Increases refrigeration effect 4. All the answers
The ratio of high temperature to low temperature in reversed carnot cycle refrigerator is 1.1. The COP of the refrigerator will be	1. 4 2. 4.5 3. 3.5 4. 10
0.7 kg/s of air enters with a specific enthalpy of 290 kJ and leaves it with 450 kJ of specific enthalpy. Velocities at inlet and exit are 6 m/s and 2 m/s respectively. Assuming adiabatic process, what is power input to the compressor?	1. 112 kW 2. 115 kW 3. 118 kW 4. 120 kW
Which one of the following phenomena occurs when gas in a piston-in-cylinder assembly expands reversibly at constant pressure?	1. Heat is added to the gas 2. Heat is removed from the gas 3. Gas undergoes adiabatic expansion 4. Gas does work from its own stored energy
The comfort conditions in air conditioning are at (where DBT = Dry bulb temperature, and RH = Relative humidity)	1. 20°C DBT and 80% RH 2. 25°C DBT and 100% RH 3. 25°C DBT and 60% RH
The dry bulb temperature lines, on the psychrometric chart are	1. horizontal and non-uniformly spaced 2. horizontal and uniformly spaced
The total and static pressures at the inlet of a steam nozzle are 186 kPa and 178 kPa respectively. If the total pressure at the exit is 180 kPa and static pressure is 100 kPa, then the loss of energy per unit mass in the nozzle will be:	1. 2 kPa 2. 6 kPa 3. 8 kPa 4. 78 kPa
In a vapor compression refrigeration cycle, heat is rejected by the refrigerant in a	1. condenser 2. evaporator 3. compressor 4. expansion valve

In a psychrometric process, the sensible heat added is 30 kJ/s and the latent heat added is 20 kJ/s. The sensible heat factor for the process will be	1.0.37 2.0.3 3.0.6 4.0.67
During adiabatic saturation process on unsaturated air _____ remains constant.	1.relative humidity 2.dew point temperature 3.wet bulb temperature
The difference between dry bulb temperature and wet bulb temperature, is called	1.dew point depression 2.dry bulb depression3.degree of saturation
Sub-cooling in a refrigeration cycle	1. increases COP 2.decreases COP 3.COP remains unaltered 4.un
A refrigeration cycle operates between condenser temperature of + 27°C and evaporator temperature of- 23°C. The Cannot coefficient of performance of cycle will be	1.0.2 2.1.2 3.10 4.5
In vapour compression refrigeration system, refrigerant occurs as liquid and vapour between	1.compressor and evaporator 2.condenser and expansion valve 3. condenser
In a vapour compression refrigeration cycle, the flow of refrigerant is controlled by	1.compressor 2.condenser 3.evaporator 4.expansion valve
Where does the lowest temperature occur in a vapour compression cycle ?	1.compressor 2.evaporator 3.condenser 4.expansion valve
Combustion in compression ignition engines is	1.laminar 2.homogeneous and hetrogeneous3. heterogeneous 4.ho
To reduce the possibility of knock in the C.I. engines, the first elements of fuel and air should have	1.high temperature 2.high density 3.all the options 4.short delay
The detonation tendency in petrol engines for specified conditions of fuel rating, compression ratio, speed etc. can be controlled by having	1.smaller cylinder bore 2.bigger cylinder bore3.medium cylinder not control detonation
Supercharging is the process of	1.supplying the intake of an engine with air at a density greater than 2.Injecting excess fuel for raising more load 3.providing forced circulation of combustion products fully
The knocking in diesel engines for given fuel, will be	1.enhanced by increasing compression ratio2.enhanced by decreasing factors 4.unaffected by compression ratio
Ignition quality of diesel-fuel oil is expressed by an index called	1.octane number 2.carbon content 3. calorific value 4.cetane number
Fuel consumption with increase in back pressure in engine will	1.remain unaffected 2.none of the options 3.increase 4.decrease
Thermal efficiency of high speed diesel engine at design load may be of the order of	1.70% 2.50% 3.35% 4.20%
The ratio of indicated thermal efficiency to the corresponding air standard cycle efficiency is called	1.net efficiency 2.efficiency ratio 3.relative efficiency 4.overall effi

In petrol engine using a fixed octane rating fuel and fixed compression ratio, super charging will	1.increase the knocking tendency 2.decrease the knocking tendency 4.unpredictable.
A compressor at high altitude will draw	1.more power 2.less power 3.same power 4.none of the options
In a nozzle, whole frictional loss is assumed to occur between	1.inlet and outlet 2.inlet and throat 3.throat and exit4.all the optimum points
If the intake air temperature of I.C. engine increases, its efficiency will	1.increase 2.decrease 3.unpredictable 4.remain same
The curved lines on a psychrometric chart indicates	1.dry bulb temperature 2.wet bulb temperature3.relative humidity
One tonne of refrigeration (1TR) means that the heat removing capacity is	1.420 kJ/min 2.210 kJ/min 3.21 kJ/min 4.620 kJ/min
Increase in entropy of a system represents	1. Increase in availability of energy 2. increase in temperature 3. decrease in pressure 4. degradation of energy
The temperature of water flowing through the turbine increases from 25°C to 27°C due to friction. If there is no heat transfer, determine the change of entropy of water.	1. 2.8 J/kgK 2. 28J/kgK 3. -2.8kJ/kgK 4. -28kJ/kgK
A paddle wheel fitted with a 300 W motor is used to stir water in a large container. The water in the container is maintained at 300 K and if the motor runs for 2 hours, determine the change in entropy of water.	1. 7200 J/K 2.

	<p>-7200 J/K</p> <p>3. 0</p> <p>4.</p> <p>72 J/K</p>
A system of 100 kg mass undergoes a process in which its specific entropy increases from 0.3 kJ/kgK to 0.4 kJ/kgK. At the same time, the entropy of the surroundings decreases from 80 kJ/K to 75 kJ/K. Determine the process.	<p>1. Reversible and isothermal</p> <p>2. Irreversible</p> <p>3. Reversible</p> <p>4. Impossible</p>
When pressure is raised in an isentropic process, the enthalpy of the substance	<p>1. Remains same</p> <p>2. Increases</p> <p>3. decreases</p> <p>4. First increases and then decreases</p>
The dryness fraction at the end of expansion of a Reheat cycle operating under the same temperature limits has	<p>1. Same as that of Rankine cycle</p> <p>2.</p>

	<p>More than that of Rankine cycle</p> <p>3.</p> <p>Less than that of Rankine cycle</p> <p>4.</p> <p>Not able to correlate with provided data.</p>
	<p>1.</p> <p>$T.dS = du + p.dv$</p> <p>2.</p> <p>$T.dS = dh + v.dp$</p> <p>3.</p> <p>$dH = T.dS + v.dp$</p> <p>4.</p> <p>$dG = Vdp - S.dT$</p>
	<p>1.</p> <p>Volume</p> <p>2. Pressure</p> <p>3.</p> <p>Temperature</p> <p>4.</p>

	Density
	<p>1. process 2. cycle 3. path 4. property</p>
If C is the number of components and φ is the number of phases in a system, the number of independent intensive properties required to specify the state of the system	<p>1. $F=C-\varphi-2$ 2. $F=C+\varphi+2$ 3. $F=C-\varphi+2$ 4. $F=C+\varphi-2$</p>

Which of the following statements about absolute zero temperature is true?

1. At absolute zero all translational motion of the particles ceases
2. At absolute zero all rotational motion of the particles ceases
3. Absolute zero is defined at -273.15°C .
4. All the above.

What mass of He gas occupies 8.5 liters at 0°C and 1 atmosphere? (The molar mass of He = 4.00 g/mol.)

1. 10.5 g
2. 1.52 g
3. 0.38 g
4. 2.6 g

A gas has a density X at standard temperature and pressure. What is the new density when the absolute temperature is doubled and the pressure increased by a factor of 3?

1. $(2/3)X$
2. $(4/3)X$
3. $(3/2)X$
4. $(3/4)X$

If a mass of oxygen gas occupies a volume of 8 L at standard temperature and pressure, what

- 1.

is the change in the volume if the temperature is reduced by one half and the pressure is doubled?

It increases to 12 L.

2.

It increases to 6 L.

3.

It increases to 2 L.

4.

It increases to 24 L.

If the pressure and volume of an ideal gas are both reduced to half their original value, the absolute temperature of the gas is

1.
unchanged.

2.
increased by a factor of 4.

3.
doubled.

4.
decreased by a factor of 4.

The relationship between the pressure and the volume of a gas expressed by Boyle's law holds true

1.
for some gases under any conditions.

2.
for all gases under any conditions.

3.
if the container of the gas can expand with increasing pressure

4.
if the temperature is constant.

The work output of theoretical Otto cycle

1.
increases with increase in compression ratio

2.
increases with increase in pressure ratio

3.
increases with increase in adiabatic index γ

	<p>4. follows all the above.</p>
In Rankine cycle the work output from the turbine is given by	<p>1. change of internal energy between inlet and outlet</p> <p>2. change of enthalpy between inlet and outlet</p> <p>3. change of entropy between inlet and outlet</p> <p>4. change of temperature between inlet and outlet.</p>
Fixed position layout is also known as	<p>1. synthetic layout</p> <p>2. analytical layout</p> <p>3. Static product layout</p> <p>4. none of these</p>
In inventory control theory, the economic order quantity is	<p>1. capacity of a warehouse</p> <p>2. average level of inventory</p> <p>3. optimum lot size</p> <p>4. lot size corresponding to break-even analysis</p>
Production cost refers to prime cost plus	<p>1. factory and administration overheads</p> <p>2. factory overheads</p> <p>3. factory, administration and sales overheads</p> <p>4. factory, administration, sales overheads and profit</p>

<p>Which one of the following chart gives simultaneously information about the progress of work and machine loading?</p>	<ol style="list-style-type: none"> 1. Process chart 2. Gantt Chart 3. Machine load chart 4. Man machine chart
<p>Work sampling is applied for</p>	<ol style="list-style-type: none"> 1. estimating the percentage of the time consumed by various job activities 2. estimation of the percentage utilisation of machine tools 3. finding out time standards, specially where the job is not repetitive and not possible 4. all of the above
<p>A systematic job improvement sequence will consist of</p>	<ol style="list-style-type: none"> 1. motion study 2. Time study 3. job enrichment 4. All of these
<p>A diagram showing the path followed by men and materials while performing a task is known as</p>	<ol style="list-style-type: none"> 1. flow process chart 2. travel chart 3. string diagram 4. flow diagram
<p>In time study, the rating factor is applied to determine</p>	<ol style="list-style-type: none"> 1. Standard time of a job 2. merit rating of the worker 3. fixation of incentive rate 4.

	normal time of a worker
The chart which gives an estimate about the amount of materials handling between various work stations is known as	<p>1. Operation chart</p> <p>2. process chart</p> <p>3. Travel chart</p> <p>4. flow chart</p>
String diagram is used	<p>1. where processes require the operator to be moved from one work</p> <p>2. for checking the relative values of various layouts</p> <p>3. when a group of workers are working at a place</p> <p>4. all of the above</p>
The determination of standard time in a complex job system is best done through	<p>1. analysis of standard data system</p> <p>2. analysis of micromotions</p> <p>3. grouping timing technique</p> <p>4. stop watch time study</p>
In a 50% reaction turbine stage, tangential component of absolute velocity at rotor inlet is 537 m/s and the blade velocity is 454 m/s. The power output in kW for unit steam flowrate will be	<p>1. 282 kW</p> <p>2. 296 kW</p> <p>3. 260 kW</p> <p>4. 302 kW</p>
In A-B-C analysis, which class of items are generally large in number?	<p>1. B</p> <p>2. A</p> <p>3.</p>

	<p>C</p> <p>4. E</p>
In break even analysis, total cost consists of	<p>1. fixed cost + variable cost</p> <p>2. Variable cost + sales revenue</p> <p>3. fixed cost + sales revenue</p> <p>4. fixed cost + variable cost + profit</p>
Direct expenses include	<p>1. factory expenses</p> <p>2. administrative expenses</p> <p>3. selling expenses</p> <p>4. none of these</p>
Which of the following type of layout is suitable for automobile manufacturing concern?	<p>1. product layout</p> <p>2. fixed position layout</p> <p>3. combination layout</p> <p>4. process layout</p>
Work study involves	<p>1. only work measurement</p> <p>2. method study and work measurement</p> <p>3. only motion study</p> <p>4. only method study</p>
Dispatching	<p>1. prescribes the sequence of operations to be followed</p> <p>2.</p>

	<p>determines the programme for the operations</p> <p>3. is concerned with the starting of processes</p> <p>4. regulates the progress of job through various processes</p>
In order to avoid excessive multiplication of facilities, the layout preferred is	<p>1. group layout</p> <p>2. product layout</p> <p>3. process layout</p> <p>4. static layout</p>
Process layout is also known as	<p>1. synthetic layout</p> <p>2. none of these</p> <p>3. static product layout</p> <p>4. analytical layout</p>
For handling materials during manufacture of cement, a _____ is widely used	<p>1. fork lift truck</p> <p>2. belt conveyor</p> <p>3. bucket conveyor</p> <p>4. fork lift truck</p>
In product layout	<p>1. machines can not be used to their maximum capacity</p> <p>2. specialised and strict supervision is required</p> <p>3. manufacturing cost rises with a fall in the volume of production</p> <p>4. all of the above</p>

Process layout is employed	1. where similar jobs are manufactured on similar machines 2. all of the above 3. where machines are arranged on functional basis 4. where low volume of production is required
Which one of the following techniques is used for determining allowances in time study?	1. Linear regression 2. Acceptance sampling 3. Performance rating 4. Work sampling
In process layout	1. production control is more difficult and costly 2. handling and back-tracking of materials is too much 3. routing and scheduling is more difficult 4. all of the above
Which of the following charts are used for plant layout design?	1. Man machine chart 2. Operation process chart 3. Travel chart 4. all of these
A-B-C analysis	1. is a basic technique of materials management 2. is meant for relative inventory control 3. does not depend upon the unit cost of the item but on its annual consumption 4.

	all of the above
Routing	<p>1. prescribes the sequence of operations to be followed</p> <p>2. is concerned with starting of processes</p> <p>3. regulates the progress of job through various processes</p> <p>4. determines the programme for the operations</p>
Indirect expenses include	<p>1. all of these</p> <p>2. factory expenses</p> <p>3. selling expenses</p> <p>4. administrative expenses</p>
Performance rating is equal to	<p>1. observed performance - normal performance</p> <p>2. observed performance + normal performance</p> <p>3. observed performance x normal performance</p> <p>4. none of the above</p>
In jobbing production	<p>1. unit costs are high</p> <p>2. all of these</p> <p>3. operations are labour-intensive</p> <p>4. highly skilled workers are needed</p>
Abbreviated work factor data is applied for	<p>1. material handling operation</p> <p>2. maintenance operation</p> <p>3.</p>

	<p>packing and shipping operation</p> <p>4. all of these</p>
According to Muther, the basic principle of best layout is	<p>1. Principle of flow</p> <p>2. principle of flexibility</p> <p>3. principle of over-all integration</p> <p>4. all of these</p>
What does a symbol D imply in workstudy	<p>1. Inspection</p> <p>2. Transportation</p> <p>3. Delay</p> <p>4. Storage</p>
The time taken by a trained worker to perform an operation, while working a steady pace, is known as	<p>1. normal time</p> <p>2. representative time</p> <p>3. standard time</p> <p>4. None of these</p>
Productivity increases when	<p>1. inputs increase while outputs remain the same</p> <p>2. inputs decrease while outputs remain the same</p> <p>3. outputs decrease while inputs remain the same</p> <p>4. inputs and outputs increase proportionately</p>
Which of the following is not a therblig?	<p>1. Use</p> <p>2.</p>

	<p>Hold</p> <p>3.</p> <p>Dispatch</p> <p>4.</p> <p>Inspect</p>
Micromotion study is	<p>1.</p> <p>enlarged view of motion study</p> <p>2.</p> <p>analysis of only one stage of motion study</p> <p>3.</p> <p>time study of small components up to microseconds</p> <p>4.</p> <p>subdivision of an operation into therbligs and their analysis</p>
Greater flexibility in plant layout is achieved in case of	<p>1.</p> <p>Process layout</p> <p>2.</p> <p>Product layout</p> <p>3.</p> <p>Combination layout</p> <p>4.</p> <p>Fixed position layout</p>
-Routing and Scheduling are integral part of	<p>1.</p> <p>Work study</p> <p>2.</p> <p>Job analysis</p> <p>3.</p> <p>Quality control</p> <p>4.</p> <p>Product planning</p>
Which one of the following chart gives simultaneously information about the progress of work and machine loading?	<p>1.</p> <p>Process chart</p> <p>2.</p> <p>Machine load chart</p> <p>3.</p> <p>Man-machine chart</p> <p>4.</p> <p>Gantt chart</p>
Which of the following statement is correct?	<p>1.</p> <p>A-B-C analysis is based on Pareto's principle.</p>

	<p>2. Simulation can be used for inventory control.</p> <p>3. Economic order quantity formula ignores variations in demand pattern.</p> <p>4. all of the above</p>
<p>The unit cost in case of batch production is _____ as compared to jobbing production.</p>	<p>1. Same</p> <p>2. Low</p> <p>3. High</p> <p>4. None</p>
<p>For a product layout the material handling equipment must</p>	<p>1. Have full flexibility</p> <p>2. Employ conveyor belts, trucks, tractors etc.</p> <p>3. Be a general purpose type</p> <p>4. Be designed as special purpose for a particular application</p>
<p>Which of the following is independent of sales forecast?</p>	<p>1. Productivity</p> <p>2. Inventory control</p> <p>3. Production planning</p> <p>4. Production control</p>
<p>Which of the following layouts is suited for mass production?</p>	<p>1. Process layout</p> <p>2. Product layout</p> <p>3. Fixed position layout</p> <p>4. Plant layout</p>

<p>Performance rating is equal to</p>	<ol style="list-style-type: none"> 1. Observed performance + normal performance 2. Observed performance - normal performance 3. Observed performance × normal performance 4. None of the above
<p>In the cost structure of a product, the selling price is determined by the factors such as</p>	<ol style="list-style-type: none"> 1. Sales turn over 2. Lowest competitive price 3. Various elements of the cost 4. All of the above
<p>Which one of the following techniques is used for determining allowances in time study?</p>	<ol style="list-style-type: none"> 1. Acceptance sampling 2. Linear regression 3. Performance rating 4. Work Sampling
<p>Merit Rating is the method of determining worth of</p>	<ol style="list-style-type: none"> 1. A job 2. An individual employee 3. A particular division in workshop 4. Machine
<p>Routing is essential in the following type of industry</p>	<ol style="list-style-type: none"> 1. Assembly industry 2. Process industry 3.

	<p>Job order industry</p> <p>4.</p> <p>Mass production industry</p>
<p>The production scheduling is simpler and high volume of output and high labour efficiency are achieved in the case of</p>	<p>1.</p> <p>Product layout</p> <p>2.</p> <p>Process layout</p> <p>3.</p> <p>Fixed position layout</p> <p>4.</p> <p>A combination of line and process layout</p>
<p>Inventory control in production, planning and control aims at</p>	<p>1.</p> <p>Achieving optimization</p> <p>2.</p> <p>Ensuring against market fluctuations</p> <p>3.</p> <p>Acceptable customer service at low capital investment in inventory</p> <p>4.</p> <p>Discounts allowed in bulk purchase</p>
<p>The allowed time for a job equals standard time plus</p>	<p>1.</p> <p>Policy allowance</p> <p>2.</p> <p>Interference allowance</p> <p>3.</p> <p>Process allowance</p> <p>4.</p> <p>Learning allowance</p>
<p>For handling materials during manufacture of cement, a _____ is widely used.</p>	<p>1.</p> <p>Belt conveyor</p> <p>2.</p> <p>Bucket conveyor</p> <p>3.</p>

	<p>Fork lift truck</p> <p>4.</p> <p>Overhead crane</p>
Process layout is employed	<p>1.</p> <p>Where low volume of production is required</p> <p>2.</p> <p>Where similar jobs are manufactured on similar machines</p> <p>3.</p> <p>Where machines are arranged on functional basis</p> <p>4.</p> <p>All of the above</p>
What does symbol 'O' imply in work study?	<p>1.</p> <p>Inspection</p> <p>2.</p> <p>Opearation</p> <p>3.</p> <p>Dealy</p> <p>4.</p> <p>Storage</p>
For a small scale industry, the fixed cost per month is Rs. 5000. The variable cost per product is Rs. 20 and sales price is Rs. 30 per piece. The break even production per month will be	<p>1.</p> <p>300</p> <p>2.</p> <p>460</p> <p>3.</p> <p>500</p> <p>4.</p> <p>1000</p>
The type of layout used for manufacturing steam turbines, is	<p>1.</p> <p>Product layout</p> <p>2.</p> <p>Process layout</p> <p>3.</p> <p>Fixed position layout</p> <p>4.</p> <p>Any one of these</p>

<p>Motion study involves analysis of</p>	<p>1. Actions of operator 2. Layout of work place 3. Tooling and equipment 4. All of the above</p>
<p>The average time recorded by work study man for an operation is called</p>	<p>1. Standard time 2. Normal time 3. Representative time 4. None of these</p>
<p>Indirect expenses include</p>	<p>1. Factory expenses 2. Selling expenses 3. Administrative expenses 4. All of these</p>
<p>Time study is carried out to determine the time required to complete job by</p>	<p>1. A slow worker 2. A fast worker 3. An average worker 4. An apprentice</p>
<p>In order to avoid excessive multiplication of facilities, the layout preferred is</p>	<p>1. Product layout 2. Process layout 3.</p>

	<p>Group layout</p> <p>4.</p> <p>Static layout</p>
Father of industrial engineering is	<p>1.</p> <p>Jack Gilbert</p> <p>2.</p> <p>Gantt</p> <p>3.</p> <p>Taylor</p> <p>4.</p> <p>Newton</p>
Choose the wrong statement Time study is used to	<p>1.</p> <p>Determine overhead expenses</p> <p>2.</p> <p>Provide a basis for setting piece prices or incentive wages</p> <p>3.</p> <p>Determine standard costs</p> <p>4.</p> <p>Determine the capability of an operator to handle the number of machines</p>
Works cost implies	<p>1.</p> <p>Primary cost</p> <p>2.</p> <p>Factory cost</p> <p>3.</p> <p>Factory expenses</p> <p>4.</p> <p>Primary cost + factory expenses</p>
Which of the following charts are used for plant layout design?	<p>1.</p> <p>Operation process chart</p> <p>2.</p> <p>Man machine chart</p> <p>3.</p> <p>Travel chart</p> <p>4.</p> <p>All of these</p>

In centrifugal compressor terminology, vane-less space refers to the space between	1. impeller tip and diffuser inlet edge 2. diffuser exit and volute casing 3. blades in the impeller 4. the inlet and blade inlet edge
In product layout	1. specialised and strict supervision is required 2. machines can not be used to their maximum capacity 3. manufacturing cost rises with a fall in the volume of production 4. all of the above
A company spends considerable amount on publicity to promote sales. This expenditure in break even chart is shown below the	1. fixed cost line 2. variable cost line 3. total cost line 4. sales revenue line
The main objective of work measurement is to	1. plan and schedule of production 2. formulate a proper incentive scheme 3. estimate the selling prices and delivery dates 4. all of the above
In fixed position layout	1. total production cost is less 2. material movement is less 3. capital investment is minimum 4. all of these
The ratio of actual whirl velocity to the ideal whirl velocity in the centrifugal compressor is called as	1. Slip factor 2. Work factor

	<p>3. Flow coefficient 4. Velocity factor</p>
A systematic job improvement sequence will consist of	<p>1. job enrichment 2. time study 3. motion study 4. All of these</p>
An axial flow compressor stage is suitable for	<p>1. high volume flow rates with a small pressure rise 2. high volume flow rates with high pressure rise 3. low volume flow rates with low pressure rise 4. low volume flow rates with high pressure rise</p>
In aircraft gas turbines, the axial flow compressor is preferred because	<p>1. of low frontal area 2. it is stall free 3. of high pressure rise 4. of high pressure rise per stage</p>
An axial flow compressor has	<p>1. larger blades at gas entry and smaller blades at exit 2. size of blades remains same only angles changes 3. identical blades at exit as well as entry 4. smaller blades at gas entry and larger blades at exit</p>
In a centrifugal pump, water enters	<p>1.Axially but leaves radially 2.At an angle but leaves axially 3.Axially</p>
Multi stage centrifugal pumps in parallel connection are used to	<p>1.Give high discharge 2.Produce high heads 3.All these options 4.</p>
A centrifugal pump delivers water at the rate of 50 litres/s against a total head of 40 metres. Then the power required to drive the pump is	<p>1. 2 kW 2. 15.2 kW 3. 19.6 kW 4. 25.8 kW</p>
Which one of the following helps in avoiding cavitation in centrifugal pumps?	<p>1. Low delivery pressure 2. High delivery pressure 3. Low suction pressure 4. High suction pressure</p>

A Francis turbine is used when the available head of water is	1. 25 m to 250 m 2. 0 to 25 m 3. none of these options 4. above 250 m
Specific speed of a Kaplan Turbine ranges between	1.1 to 10 2.10 to 100 3.more than 100 4.none of the above
Consider the following characteristics: 1. The fluid enters the pump axially and is discharged radially 2. Maximum efficiency may be of the order of 90% 3. Development of a low head 4. A limited suction capacity Which of the above characteristics are possessed by axial flow pumps?	1. 1 and 2 2. 2 and 3 3. 2 and 4 4. 3 and 4
Which one of the following is the correct statement? The degree of reaction of an impulse turbine:	1.is equal to zero 2.is greater than zero 3.is less than zero 4.increase
Braking jet in an impulse turbine is used	1.to increase the speed of the runner 2.to change the direction of 4.to break the jet of water
Consider the following statements regarding an impulse turbine: 1. Relative velocity at the inlet and exit of the rotor blades are the same. 2. Absolute velocity at the inlet and exit of the rotor blades are the same. 3. Static pressure within the rotor blade channel is constant. 4. Total pressure within the rotor blade channel is constant. Of these statements:	1. 1 and 3 are correct 2. 2 and 3 are correct 3. 1 and 4 are correct 4. 2 and 4 are correct
If the enthalpy drops of moving blade and fixed blade of a stage in a reaction turbine are 9 and 11 kJ/kg respectively, then degree of reaction of the stage is	1. 0.1 2. 1.0 3. 0.45 4. 0.55
The degree of reaction of a turbine is the ratio of enthalpy drop in	1. fixed blades to enthalpy drop in the stage 2. moving blades to enthalpy drop in the stage 3. fixed blades to enthalpy drop in moving blades

	4. moving blades to enthalpy drop in fixed blades
In motion and time study which of the following is used in product analysis?	<p>1.</p> <p>Process chart</p> <p>2.</p> <p>man machine chart</p> <p>3.</p> <p>Multi process chart</p> <p>4.</p> <p>All of the above</p>
Consider the following statements regarding the axial flow in an air compressor: 1. Surging is a local phenomenon while stalling affects the entire compressor. 2. Stalling is a local phenomenon while surging affects the entire compressor. 3. The pressure ratio of an axial compressor stage is smaller than that of a centrifugal compressor stage. Of these statements	1.1 and 3 are correct 2.1, 2 and 3 are correct 3.2 and 3 are correct
The hydraulic efficiency of a reaction turbine, is the ratio of	<p>1. workdone on the wheel to the energy (or head of water) actually supplied</p> <p>2. power produced by the turbine to the energy actually supplied</p> <p>3. actual work available at the turbine to energy imparted to the water</p> <p>4. none of these options</p>
In motion and time study which of the following is used in man analysis?	<p>1.</p> <p>Man and machine analysis chart</p> <p>2.</p> <p>Man and machining operation time chart</p> <p>3.</p> <p>Man and machine, process time chart</p> <p>4.</p> <p>All of the above</p>
The function of the draft tube in a reaction turbine is	<p>1. To enable the shaft of the turbine to be vertical</p> <p>2. To transform a large part of pressure energy at turbine outlet into kinetic energy</p> <p>3. To avoid whirl losses at the exit of the turbine</p> <p>4. To transform a large part of kinetic energy at the turbine outlet into pressure energy</p>
Which of the following is unavoidable delay?	<p>1.</p> <p>Waiting for raw material</p> <p>2.</p> <p>Non-availability of inspection gauge</p> <p>3.</p> <p>Non-availability of power</p> <p>4.</p>

	Tool breakage
The most important objective behind plant layout is	<p>1. Overall simplification, safety of integration</p> <p>2. Economy in space</p> <p>3. Maximum travel time in plant</p> <p>4. To provide conveniently located shops</p>
What is the productivity for a company produces 40kg of plastic parts of acceptable quality by consuming 50kg of raw material	<p>1. 0.8</p> <p>2. 1.25</p> <p>3. 0.44</p> <p>4. 2.25</p>
Based on the direction of flow, which one of the following turbines is different from the other three?	<p>1. Pelton turbine</p> <p>2. Parson's turbine</p> <p>3. De Laval turbine</p> <p>4. Kaplan turbine</p>
One of the following doesn't mean "Partial Productivity"	<p>1. Indicates how much of a particular kind of input it takes to produce a unit output</p> <p>2. Outputs/(Single kind of input)</p> <p>3. $(\text{Total Output})/(\text{Total Input})$</p> <p>4. How efficiently company use only one input, such as raw materials</p>
For prosperity growth of any business we need	<p>1. Both Effectiveness and Efficiency</p> <p>2.</p>

	<p>Effectiveness only</p> <p>3.</p> <p>Efficiency only</p> <p>4.</p> <p>None of the above</p>
The determination of standard time in a complex job system is best done through	<p>1.</p> <p>Stop watch time study</p> <p>2.</p> <p>Analysis of micro-motions</p> <p>3.</p> <p>Grouping timing technique</p> <p>4.</p> <p>Analysis of standard data system</p>
Which of the following are the principles of material handling?	<p>1.</p> <p>Keep all the handling to the minimum</p> <p>2.</p> <p>Select only efficient handling equipment</p> <p>3.</p> <p>Move the heaviest weight to the least distance</p> <p>4.</p> <p>All of the above</p>
Which of the following type of layout is suitable for automobile manufacturing concern?	<p>1.</p> <p>Product layout</p> <p>2.</p> <p>Process layout</p> <p>3.</p> <p>Fixed position layout</p> <p>4.</p> <p>Combination layout</p>
The stagnation pressure rise in a centrifugal compressor takes place	<p>1.in the inlet guide vanes only</p> <p>2.in the impeller only</p> <p>3.in the diffuser</p>
For a single stage impulse turbine with a rotor diameter of 2 m and a speed of 3000 rpm when the nozzle angle is 20° , the optimum velocity of steam in m/s is	<p>1. 356</p> <p>2. 334</p> <p>3. 711</p> <p>4. 668</p>

<p>Manometric efficiency of a centrifugal pump is defined as the ratio of</p>	<ol style="list-style-type: none"> 1. head imparted by the impeller to water to the suction head 2. manometric head to the head imparted by the impeller to water 3. suction head to the head imparted by the impeller to water 4. manometric head to the head imparted by the impeller to water
<p>Which one of the following helps in avoiding cavitation in centrifugal pumps?</p>	<ol style="list-style-type: none"> 1. Low suction pressure 2. High suction pressure 3. Low delivery pressure 4. High delivery pressure
<p>In a pelton Wheel the bucket peripheral speed is 10 m/s, the water jet velocity is 25 m/s and volumetric flow rate of the jet is $0.1\text{m}^3/\text{s}$. If the jet deflection angle is 120° and the flow is ideal, the power developed is</p>	<ol style="list-style-type: none"> 1. 15 kW 2. 37.5 kW 3. 7.5 kW 4. 22.5 kW
<p>A Pelton wheel turbine is,</p>	<ol style="list-style-type: none"> 1. Outward flow impulse turbine 2. Inward flow reaction turbine 3. Inward flow impulse turbine 4. Tangential flow impulse turbine
<p>Kaplan turbine need to have the following for maintaining high efficiency</p>	<ol style="list-style-type: none"> 1. Variable angle blades 2. More number of blades 3. Less number of blades 4. Fixed angle blades
<p>A Kaplan turbine is,</p>	<ol style="list-style-type: none"> 1. Low head axial flow turbine. 2. An reaction turbine, outward flow type 3. An impulse turbine, inward flow type 4. A high head mixed flow turbine
<p>Which of the following components of reaction turbine increases the head on the turbine by an amount equal to the height of runner outlet above the tail race?</p>	<ol style="list-style-type: none"> 1. Scroll casing 2. Draft tube 3. Guide vanes 4. Moving vanes
<p>Steam enters the rotor of a reaction turbine with an absolute velocity of 236 m/s and the relative velocity of 132 m/s. It leaves the rotor with a relative velocity of 232 m/s absolute velocity of 126 m/s. The specific work output is</p>	<ol style="list-style-type: none"> 1. 40.1 kJ/kg 2. 47.4 kJ/kg 3. 38.1 kJ/kg 4. 43.8 kJ/kg
<p>Consider the following statements:</p> <ol style="list-style-type: none"> 1. Almost all flow losses take place in the diverging part of a nozzle. 2. Normal shocks are likely to occur in the converging part of a nozzle. 3. Efficiency of reaction turbines is higher than that of impulse turbines. <p>Of these statements</p>	<ol style="list-style-type: none"> 1. 2 and 3 are correct 2. 1 and 3 are correct 3. 1, 2 and 3 are correct 4. 1 and 2 are correct

<p>Which of the followings are the demerits of single impulse stage</p> <ol style="list-style-type: none"> 1. Requirement of C-D nozzle 2. Enhanced shock associated losses 3. More boundary layer associated losses in comparison with single reaction stage 	<ol style="list-style-type: none"> 1. 1 and 2 only 2. 1 and 3 only 3. 2 and 3 only 4. 1,2 and 3
<p>The pressure rise in the impeller of centrifugal compressor is achieved by</p>	<ol style="list-style-type: none"> 1. the centrifugal and diffusion action 2. the centrifugal and push-pull action 3. the centrifugal action and decrease in volume 4. the decrease in volume and diffusion action
<p>Stalling of blades in axial- flow compressor is the phenomenon of</p>	<ol style="list-style-type: none"> 1. motion of air at sonic velocity 2. air stream not able to follow the blade contour 3. unsteady, periodic and reversed flow 4. air stream blocking the passage
<p>An impulse turbine produces 50 kW of power when the blade mean speed is 400 m/s. What is the rate of change of momentum tangential to the rotor?</p>	<ol style="list-style-type: none"> 1. 150 N 2. 125 N 3. 200 N 4. 175 N
<p>Considering the variation of static pressure and absolute velocity in an impulse steam turbine, across one row of moving blades</p>	<ol style="list-style-type: none"> 1. both pressure and velocity decrease 2. pressure remains constant, while velocity decreases 3. pressure decreases but velocity increases 4. pressure remains constant, while velocity increases
<p>The static temperature and Mach number at the inlet of a centrifugal compressor are 303 K and 0.5 respectively. The stagnation temperature of the air at the inlet will be:</p>	<ol style="list-style-type: none"> 1. 34.6 degree Celcius 2. 60.3 degree Celcius 3. 45.15 degree Celcius 4. 31.5 degree Celcius
<p>When $n = 1.3$ and $\gamma = 1.4$, the polytropic efficiency of a turbine is</p>	<ol style="list-style-type: none"> 1. 80.7% 2. 70.7% 3. 60.7% 4. 90.7%
<p>The overall efficiency of the compressor is _____ than the stage efficiency</p>	<ol style="list-style-type: none"> 1. less 2. higher 3. same 4.

<p>The pressure of the working fluid changes in both stator and rotor for a impulse stage of turbine</p>	<p>1. Yes 2. No 3. 4.</p>
<p>What is the ratio of isentropic work to Euler work in an centrifugal compressor called?</p>	<p>1. Work coefficient 2. Velocity coefficient 3. Pressure coefficient 4. Flow coefficient</p>
<p>The ratio of actual whirl velocity to the ideal whirl velocity in the centrifugal compressor is called as _____.</p>	<p>1. velocity factor 2. slip factor 3. work factor 4. none of the above</p>

Hydraulic grade line for flow in a pipe of constant diameter is	1.always above the energy grade line 2.always above the centreline of the pipe 3.always sloping downwards in the direction of the flow 4.coincides with the pipe centreline
For a single stage impulse turbine with a rotor diameter of 2 m and a speed of 3000 rpm when the nozzle angle is 20° , the optimum velocity of steam in m/s is	1. 356 2. 334 3. 711 4. 668
Non-coplaner concurrent forces are those forces which	1. do not meet at one point and their lines of action do not lie on the same plane 2. meet at one point, but their lines of action do not lie on the same plane 3. meet at one point and their lines of action also lie on the same plane 4. do not meet at one point, but their lines of action lie on the same plane
Which of the following statement is correct?	1.The kinetic energy of a body during impact remains constant. 2.The kinetic energy of a body before impact is less than the kinetic energy of a body after impact. 3.The kinetic energy of a body before impact is equal to the kinetic energy of a body after impact. 4.The kinetic energy of a body before impact is more than the kinetic energy of a body after impact.
The slender 200-kg beam is suspended by a cable at its end as shown. If a man pushes on its other end with a horizontal force of 30 N, determine the initial acceleration of its mass center G, the beam's angular acceleration, and the tension in the cable AB.	1. $aG = 0, = 0.225 \text{ rad/s}^2, T = 1.962 \text{ kN}$ 2. $aG = 0.0750 \text{ m/s}^2, = 0.1125 \text{ rad/s}^2, T = 1.962 \text{ kN}$ 3. $aG = 0, = 0.1125 \text{ rad/s}^2, T = 1.962 \text{ kN}$ 4. $aG = 0.1500 \text{ m/s}^2, = 0.225 \text{ rad/s}^2, T = 1.962 \text{ kN}$
The purpose of a riser in a mold is	1. to do a function same as the cope while preparing the mold 2. to help raise the mold from the floor while preparing the mold 3. to feed liquid metal into the body of casting as it solidifies 4. to enhance the draft
The acceleration of a body sliding down an inclined surface is	1.g sin(theta) 2.g tan(theta) 3.g cos(theta) 4.none of these options
The ratio of the plastic moment capacity to the yield moment capacity of a rolled steel beam section is about	1. 1.7 2. 1.5

3.
1.15

4.
0.85

According to the law of moments, if a number of coplaner forces acting on a particle are in equilibrium, then	1.their algebraic sum is zero 2.the algebraic sum of their moments about any point in their plane is zero 3.the algebraic sum of their moments about any point is equal to the moment of their resultant force about the same point. 4.their lines of action are at equal distances
The centroid of a semi-circle area lies at a distance of _____ from its base measured along the vertical radius.	1. $3r/4\pi$ 2. $3r/8$ 3.$r/3\pi$ 4. $8r/3$
Which of the following is a scalar quantity?	1.Velocity 2.Acceleration 3.Speed 4.Force
The rate of change of momentum is directly proportional to the impressed force, and takes place in the same direction in which the force acts. This statement is known as	1. Newton's first law of motion 2. Newton's third law of motion 3. none of these 4. Newton's second law of motion
A couple produces	1. combined translatory and rotational motion 2. none of these 3. translatory motion 4. rotational motion
A rubber ball is dropped from a height of 2 m. If there is no loss of velocity after rebounding, the ball will rise to a height of	1. 4 m 2. 3 m 3. 2 m 4. 1 m
Moment of inertia of a triangular section of base (b) and height (h) about an axis passing through its vertex and parallel to the base, is _____ than that passing through its C.G. and parallel to the base.	1.seven times 2.nine times 3.five times 4.six times
A ladder is resting on a smooth ground and leaning against a rough vertical wall. The force of friction will act	1.away from the wall at its upper end 2.downward at its upper end 3.towards the wall at its upper end 4.upward at its upper end
Which of the following statement is correct in connection with projectiles?	1.A path, traced by a projectile in the space, is known as trajectory. 2.The velocity with which a projectile is projected, is known as the velocity of projection. 3.The angle, with the horizontal, at which a projectile is projected is known as angle of projection. 4.all of the above

Sludge digestion is	<ol style="list-style-type: none"> 1. Disposal of sludge 2. Dilution of sludge 3. Stabilization of sludge 4. Removal of waste products from sludge
	<ol style="list-style-type: none"> 1. 2. 3. 4.
Imperial standard yard is made of _____	<ol style="list-style-type: none"> 1. Silver 2. Platinum 3. Bronze 4. None of the options are correct
Adding ‘C’ to pure Fe will,	<ol style="list-style-type: none"> 1. Reduce the melting point 2. Increase the melting point 3. No change 4. Change volume drastically

<p>If the resultant of two equal forces has the same magnitude as either of the forces, then the angle between the two forces is</p>	<p>1.30° 2.90° 3.60° 4.120°</p>
<p>Moment of inertia of a circular section about an axis perpendicular to the section is</p>	<p>1.pi d³/32 2.pi d⁴/64 3.pi d³/16 4.pi d⁴/32</p>
<p>If a rigid body is in equilibrium under the action of three forces, then</p>	<p>1.the lines of action of these forces are parallel 2.these forces are equal 3.the lines of action of these forces meet in a point 4.none of these options</p>
<p>Two coplanar couples having equal and opposite moments</p>	<p>1.cannot balance each other. 2.produce a couple and an unbalanced force 3.balance each other 4.are equivalent</p>
<p>A single force and a couple acting in the same plane upon a rigid body</p>	<p>1.cannot balance each other 2.none of these options 3.balance each other 4.produce moment of a couple</p>
<p>A body moves, from rest with a constant acceleration of 5 m per sec. The distance covered in 5 sec is most nearly</p>	<p>1.96 m 2.kinematic friction 3.38 m 4.62.5 m</p>
<p>Error of measurement = _____</p>	<p>1. a) True value – Measured value 2. c) Measured value – Precision 3. b) Precision – True value 4. d) Measures value - 0.5x precision</p>
<p>Which of the following curve has a negative slope for water as working fluid in the P-T phase diagram</p>	<p>1. Fusion curve 2. evaporation curve 3. triple point line 4. sublimation curve.</p>

Filler metal is used in _____	1. electric spot welding 2. seam welding 3. projection welding 4. none of these options
Comparing an unknown with a standard through calibrated system is called _____	1. b) Indirect comparison 2. a) Direct comparison 3. c) Drastic calibration 4. d) None of the options
Among the following options, pick the line standard of measurement	1. d) End bars 2. c) Micrometer 3. a) Measuring tape 4. b) Slip gauge
The angle gauge by Dr. Tomlinson consists of a set of _____	1. d) 16 gauges 2. c) 14 gauges 3. a) 10 gauges 4. b) 12 gauges
The principle of 'Inter-changeability' is normally employed for _____	1. c) Mass production 2. b) Production of identical parts 3. a) Parts within the prescribed limits of sizes 4. d) For all the options
Following is the theoretical size which is common to both the parts of a mating pair	1. d) None of the options 2. c) Base size 3. a) Normal size 4. b) Actual size
A force acting on a body may	1.introduce internal stresses 2.retard its motion 3.balance the other forces acting on it 4.all of these options
When trying to turn a key into a lock, following is applied	1.non-coplanar forces 2.moment 3.coplanar force 4.couple
Fill up the blank	1. Precision 2. mean value 3.

	<p>Reynolds constant 1.4</p> <p>4. Systematic error</p>
The main function of CAD is	<p>1. Documentation</p> <p>2. Curing</p> <p>3. Marketing</p> <p>4. Manufacturing</p>
The unit cells	<p>1. contain the smallest number of atoms which when taken together have all the properties of the crystals of the particular metal</p> <p>2. have the same orientation and their similar faces are parallel</p> <p>3. may be defined as the smallest parallelopiped which could be transposed in three coordinate directions to build up the space lattice</p> <p>4. All of the above</p>
Emulsified oils which are used in machine shop are	<p>1. lubricating oils diluted with naphta, kerosene or other petroleum-base solvents</p> <p>2. mixture of oil and water used for lubricating and cooling</p> <p>3. oils that have degraded over time</p> <p>4. high in sulphur content</p>
Chills are used in moulds to	<p>1. reduce the possibility of blow holes</p> <p>2. achieve directional solidification</p> <p>3. reduce freezing time</p> <p>4. smoothen metal flow for reducing splatter</p>
Disposable patterns are made of	<p>1. polystyrene</p> <p>2. metal</p> <p>3. rubber</p> <p>4. wood</p>
Shell moulding requires	<p>1. Polystyrene patterns</p> <p>2. Wooden patterns</p> <p>3. Sand patterns</p> <p>4. Metal patterns</p>
A system in dynamic balance implies that	<p>1. there will absolutely no wear of bearings</p> <p>2. there is no critical speed in the system</p> <p>3. the system is critically damped</p> <p>4. the system is also statically balanced</p>
Analytical checking of gears includes checking of _____	<p>1. tooth profile</p> <p>2. vibrations</p> <p>3. noise level</p>

	<p>4. None of the options are correct</p>
A rigid container of air is at atmospheric pressure and 27°C. To double the pressure in the container, heat it to	<p>1. 54°C</p> <p>2. 300°C</p> <p>3. 327°C</p> <p>4. 600°C</p>
Center of gravity of a solid cone lies on the axis at the height	<p>1.one-third of the total height above base</p> <p>2.none of these options</p> <p>3.one-fourth of the total height above base</p> <p>4.three-eighth of the total height above the base</p>
A package is dropped from the plane which is flying with a constant horizontal velocity of $v_A = 150$ ft/s at a height $h = 1500$ ft. Determine the radius of curvature of the path of the package just after it is released from plane at A.	<p>1. 9860 ft</p> <p>2. 3000 ft</p> <p>3. 1500 ft</p> <p>4. 8510 ft</p>
The uniform pole has a mass of 15 kg and falls from rest when $\theta = 90^\circ$ until it strikes the edge at A, $\theta = 60^\circ$. If the pole then begins to pivot about this point after contact, determine the pole's angular velocity just after the impact. Assume that the pole does not slip at B as it falls until it strikes A.	<p>1. angular velocity = 1.146 rad/s</p> <p>2. angular velocity = 0.537 rad/s</p> <p>3. angular velocity = 2.15 rad/s</p> <p>4. angular velocity = 1.528 rad/s</p>
The air around us has 78% nitrogen and 21% oxygen. If the pressure is 1 atm, the pressure due to oxygen is	<p>1. 0.21 atm</p> <p>2. 0.78 atm</p> <p>3. 1 atm</p>

	<p>4. 0.67 atm</p>
The disadvantage of product layout is	<p>1. High initial investment for the specialized facilities</p> <p>2. Skilled labour to operate machines</p> <p>3. Production time is longer, requiring more goods in inventory</p> <p>4. High cost of inspection</p>
Work sampling is applied for	<p>1. estimation of the percentage utilisation of machine tools</p> <p>2. estimating the percentage of the time consumed by various job activities</p> <p>3. finding out time standards, specially where the job is not repetitive and where time method is not possible</p> <p>4. all of the above</p>
In manufacturing management, the term 'Dispatching' is used to describe	<p>1. Dispatch of sales order</p> <p>2. Dispatch of factory mail</p> <p>3. Dispatch of finished product of the user</p> <p>4. Dispatch of work orders through shop floor</p>
Friction power of the IC engine will _____ if the engine speed is increased.	<p>1. increases 2. no effect 3. decreases 4. depends of other engine torque</p>
Euler equation for turbomachines is derived on the basis of	<p>1. Rate of change of angular momentum 2. Rate of change of linear momentum 3. Conservation of mass 4. Rate of change of velocity</p>

<p>Rankine cycle efficiency of well maintained steam power plant is in the range of</p>	<ol style="list-style-type: none"> 1. 35% to 45% 2. less than 10% 3. 50% to 60% 4. 10% to 20%
<p>This is a conical-shaped recess around a hole, often used to receive a tapered screw head :</p>	<ol style="list-style-type: none"> 1. Boss 2. Spotface 3. Counterbore 4. Countersink
<p>This is a rounded exterior blend between surfaces:</p>	<ol style="list-style-type: none"> 1. Fillet 2. Round 3. Taper 4. Chamfer
<p>The instantaneous centres which vary with the configuration of the mechanism are called</p>	<ol style="list-style-type: none"> 1. permanent instantaneous centres 2. fixed instantaneous centres 3. neither fixed nor permanent instantaneous centres 4. flexible instantaneous centres
<p>Module of a gear is (T- number of teeth; D-Diameter of the gear)</p>	<ol style="list-style-type: none"> 1. T/D 2. $2D/T$ 3. $2T/D$ 4. D/T
<p>A reversible thermodynamic cycle containing only three processes and producing work is to be constructed. The constraints are (a) there must be one isothermal process, (b) there must be one isentropic process, (c) the maximum and minimum cycle pressures and clearance volume are fixed and (d) polytrophic processes are not allowed. Then the number of possible cycles is/are</p>	<ol style="list-style-type: none"> 1. 2. 3. 4.

Which of the following operating systems is used with CAD systems?

1. LINUX
2. all the answers
3. UNIX
4. DOS

During the execution of a CNC part program block NO20 GO2 X45.0 Y25.0 R5.0 the type of tool motion will be

1. Circular Interpolation - clockwise
2. Circular Interpolation - counterclockwise
3. Linear Interpolation
4. Rapid feed

Group technology and CAPP are the activities of

1. Computer Aided Engineering
2. Computer Aided Manufacturing
3. Computer Integrated Manufacturing
4. Flexible manufacturing

Which of the following could NOT be used to indicate a temperature change? A change in:

1. Colour of a metal rod
2. Length of a liquid column
3. Electrical resistance
4. Mass of one mole of gas at constant pressure

The temperature recorded by a thermometer when its bulb is surrounded by a wet cloth exposed to air.

1. Dew point temperature
2. Dry-bulb temperature
3. Wet-bulb temperature
4. None of the answers

The most useful secondary datum feature can be

- 1.a hole that is perpendicular to the primary datum
- 2.a set of straight parallel grooves.
- 3.circular features parallel to the primary datum
- 4.any flat feature perpendicular to the primary datum

All geometric form controls are variations and combinations of	<p>1. straightness</p> <p>2. cylindricity</p> <p>3. flatness</p> <p>4. roundness</p>
Which of the following are intensive properties	<p>1. Gibb's free energy</p> <p>2. Enthalpy</p> <p>3. Entropy</p> <p>4. Density</p>
Which symbol is used with angular dimensions?	<p>1. R</p> <p>2. °</p> <p>3. Ø</p> <p>4. W</p>
The weld pool is surrounded by an inert gas in	<p>1. submerged arc welding</p> <p>2. MIG(GMAW)</p> <p>3. carbon arc welding</p> <p>4. arc welding (SMAW)</p>
In electrical resistance welding	<p>1. voltage is low and current is high</p> <p>2. both voltage and current are low</p> <p>3. voltage is high and current is low</p> <p>4. both voltage and current are high</p>
The drag force on a body	<p>1.is the component of the resultant force in a direction perpendicular to the direction of gravity</p> <p>2.is the net pressure force on the body</p> <p>3.is the net frictional force on the body</p> <p>4.is the component of the resultant force in the direction of the relative velocity</p>
Inter cooling in compressors	<p>1.cools the delivered air</p>

	<p>2. results in saving of power in compressing a given volume to given pressure 3. is the standard practice for big compressors 4. enables compression in two stages</p>
The linear momentum equation is based on	<p>1. Newton's law of viscosity 2. Newton's first law 3. Newton's second law 4. Newton's third law</p>
A perfect fluid (also known as an ideal fluid is),	<p>1. A real fluid 2. The one which obeys perfect gas laws 3. Compressive and gaseous 4. Incompressible and frictionless</p>
Broadly speaking, water is ,	<p>1. 10 times more compressible than steel 2. 80 times more compressible than steel 3. 800 times less compressible than steel 4. 8000 times less compressible than steel</p>
Indicate the incorrect statement: A flow net _____	<p>1. is applicable to irrotational fluid flow 2. for a given boundary is the same whether the flow is in one direction or the other 3. for a given boundary is applicable to one chosen direction of flow; if the flow is reversed the flow net will change 4. will be so constructed that the size of the mesh is inversely proportional to the</p>

Bernoulli equation is applicable between any two points,

1. in any rotational flow of an incompressible fluid
2. in any type of irrotational flow of a fluid
3. in steady rotational flow of an incompressible fluid
4. in steady, irrotational flow of an incompressible fluid

The piezometric head of a flow is

1. the sum of the velocity head and datum head
2. the sum of the pressure head and velocity head
3. the sum of the pressure head and velocity head
4. the sum of the velocity head, pressure head and datum head

In a flow of a real fluid with no addition of energy

1. the energy line will be horizontal or sloping upward in the direction of the flow
2. the energy line can never be horizontal or sloping upward in the direction of the flow
3. the piezometric line can never be horizontal or sloping downward in the direction of the flow
4. the centre line of the pipe can never be above the energy line

The total head in a flow is the sum of

1. potential head and datum head
2. piezometric head and pressure head
3. piezometric head and velocity head
4. piezometric head, velocity head and datum head

The difference between the total head line and the hydraulic grade line represents

1. the velocity head
2. the piezometric head
3. the pressure head
4. the elevation head

In a pipeline the hydraulic grade line is above the pipe centre line at point A and below the pipe centre line at another point B. From this it can be inferred that

1. vacuum pressure prevail at B
2. vacuum pressure prevail at A
3. the flow is from A to B
4. the flow is from B to A

In a two-dimensional duct flow air flows in the bottom half of the duct with uniform velocity and there is no flow in the upper half. The value of the kinetic energy correction factor for this flow is

1. 2.0
2. 2.25
3. 3.0
4. 4.0

A 15 cm diameter pipe carries a flow of 70 lit/s of an oil ($\text{RD}=0.75$). At a section 12 cm above the datum the pressure is vacuum of 2 cm of mercury. If the kinetic energy correction factor for this section is 1.1, the total head at the section in meters of oil is

1. 0.648
2. 0.728
3. 0.557
4. 0.637

A nozzle direct a liquid jet at an angle of elevation 45 deg. The hydraulic grade line for the jet

1. coincides with the centre line of the jet
2. will be horizontal at the level of the jet

	<p>3. will be horizontal at the level of the energy line 4.coincides with the energy line</p>
A water jet has an area of 0.03 sq.m and impinges normally on a plate. If a force of 1 kN is produced as a result of this impact, the velocity of the jet, in m/s, is	<p>1. 15 2. 33.4 3. 3.4 4. 5.78</p>
A water jet 0.015 sq.m in area has a velocity of 15 m/s. If this jet impinges normally on a plate which is moving at a velocity of 5 m/s in the direction of the jet, the force on the plate due to this impact is	<p>1. 3368 N 2. 2246 N 3. 14907 N 4. 14686 N</p>
A fire hose has a nozzle attached to it and the nozzle discharges a jet of water into the atmosphere at 20 m/s. This places the joint of the nozzle	<p>1. in compression 2. in tension 3. in a state of zero stress 4. in bending stresses</p>
A two-dimensional jet strikes a fixed two-dimensional plane at 45 deg. To the normal to the plane. This causes the jet to split into two streams whose discharges are in the ratio	<p>1. 1.0 2. 2.41 3. 5.83 4. 1.414</p>
The velocity distribution over one half of a cross section is uniform and is zero over the remaining	<p>1. 2.0 2.</p>

<p>half. The momentum correction factor for this cross section is</p>	<p>4.0 3. 1.0 4.3.0</p>
<p>Hydraulic grade line for flow in a pipe of constant diameter is</p>	<p>1. always above the centreline of the pipe 2. always above the energy grade line 3. always sloping downwards in the direction of the flow 4. coincides with the pipe centreline</p>
<p>A control volume is</p>	<p>1. the volume of fluid flowing per unit of time 2. a volume fixed in space 3. the volume in which a control device is situated 4. the volume of the fluid controlling device</p>
<p>The line momentum equation is</p>	<p>1. scalar relation 2. an approximate relation for engineering analysis 3. a relation applicable to incompressible fluids only 4. a vector relation</p>
<p>The linear momentum equation applied to a control volume in a flow through a nozzle yielded the resultant reaction force R, on the fluid in the control volume. The force required to keep the nozzle in position is</p>	<p>1. the same as R in magnitude and direction 2. equal to R but opposite in direction 3. equal to the x-component of R 4. equal to R minus the friction force</p>

1.
1597 N

2.
1996 N
3.
15665 N
4.
19581 N

A jet of oil ($R=0.8$) has an area of 0.02 sq.m and a velocity of 10 m/s. If it strikes a plate normally, the force exerted on the plate is

1.
 $\frac{1}{2}$ times the total load
2.
 $\frac{1}{4}$ times the total load
3.
 $\frac{8}{3}$ times the total load
4.
 $\frac{3}{8}$ times the total load.

1.
M

2.
M/2
3.
 $M/3$
4.
Zero

A beam is fixed at one end and simply supported at the other end. If a moment M is applied at the simply supported end, the moment induced at the fixed end is

1.
 $W^2l^5/84 EI$
2.
 $W^2l^5/184 EI$
3.
 $W^2l^5/240 EI$

A simply supported beam of span L carries a u.d.l. of w per unit length over the entire span. The strain energy stored by the beam is given by

	<p>4.</p> $W^2 l^5 / 384 EI$
<p>What is the ratio of the bending moment at the centre of a simply supported beam to the bending moment at the centre of a fixed beam, when both are of same span and both are subjected to same u.d.l.</p>	<p>1. 1.5</p> <p>2. 3</p> <p>3. 6</p> <p>4. 9</p>
<p>When a single load 'W' moves over a simply supported beam, the maximum B.M. at a section will occur when the load is placed.</p>	<p>1. Over the section</p> <p>2. At centre of span</p> <p>3. Over the nearer support</p> <p>4. Over the farther support</p>
<p>When a single load W moves over a simply supported beam, the curve for maximum shear force, + ve or - ve will be a</p>	<p>1 Parabola with maximum ordinate W at centre of span and zero at supports</p> <p>2. Parabola with maximum ordinate W at supports</p> <p>3. Triangle with maximum ordinate W at a support</p> <p>4.A triangle with maximum ordinate W at centre and zero at the two supports</p>

<p>A simply supported beam and a fixed beam are of same span and same uniform flexural rigidity. If they are subjected to same u.d.l. over the entire span, the deflection at the centre in the case of fixed beam will be</p>	<ol style="list-style-type: none"> 1. Half of the deflection at the centre of the simply supported beam 2. One-fourth of the deflection at the centre of the simply supported beam 3. 4. One-fifth of the deflection at the centre of the simply supported beam
<p>The intercept between a given arch and a linear arch at a section is proportional to</p>	<ol style="list-style-type: none"> 1. The horizontal thrust 2. The shear force at the section 3. The vertical reaction at the support 4. The bending moment at the section
<p>The maximum tension in a cable occurs</p>	<ol style="list-style-type: none"> 1. At the highest point in the cable 2. At the lowest point in the cable 3. At the centre of the cable 4. At all points in the cable
<p>The maximum shear stress from a Mohr's circle is given by</p>	<ol style="list-style-type: none"> 1. The diameter of the circle 2. The distance of centre from the origin 3.

The distance of farthest point on the Mohr's

4.

The radius of the circle

- 1.
- 2
- 2.04
- 3.
- 2.5
- 4.
- 4

1.

$$WL^2/6EI$$

- 2.
- $WL^2/48EI$
- 3.
- $WL^2/8EI$
- 4.
- $WL^2/16EI$

- 1.
- $Wl/2$
- 2.
- $Wl/4$
- 3.
- $Wl^2/2$
- 4.
- $Wl^2/4$

- 1.
- 200
- 2.
- 250**
- 3.
- 300
- 4.

If the poisson's ratio of a material is 0.25, the ratio of Modulus of rigidity to the young's modulus is

A simply supported beam is subjected to a central concentrated load. The slope at the two ends is given by

A simply supported beam is subjected to a uniformly varying load with zero intensity at the two ends increasing to w/m at the centre. The maximum shear force is

The minimum quantity of cement content needed in one m^3 of a reinforced concrete which is exposed to sea weather conditions (in kg)

	350
The permissible bearing stress on full area of concrete shall be taken as	<p>1. 0.2 f_{ck}</p> <p>2. 0.3f_{ck}</p> <p>3. 0.25f_{ck}</p> <p>4. 0.45 f_{ck}</p>
If the permissible compressive and tensile stresses in a singly reinforced beam are 5 N/mm ² and 140 N/mm ² respectively and the modular ratio is 18.67, the percentage area of the steel required is	<p>1. 0.45</p> <p>2. 0.51</p> <p>3. 0.61</p> <p>4. 0.71</p>
The minimum amount of negative moment reinforcement in R.C.C. beams that should extend beyond the point of inflection is	<p>1. One-third of the total</p> <p>2. One-fourth of the total</p> <p>3. Zero</p> <p>4. Half of the total</p>
The maximum horizontal distance between the parallel main reinforcement bars in solid slabs is	<p>1. 5 times the effective depth or 450 mm whichever is smaller</p> <p>2. 3 times the effective depth or 450 mm whichever is less</p> <p>3. 200 mm or 3 times the effective depth whichever is more</p>

	<p>4. 200 mm or 5 times the effective depth whichever is more.</p>
The surface width of cracks shall not generally exceed	<p>1. 0.1 mm 2. 0.2 mm 3. 0.3 mm 4. 0.4 mm</p>
The type of cement preferred in the construction of massive concrete dam is	<p>1. Ordinary Portland cement 2. Rapid hardening cement 3. Low heat cement 4. White cement</p>
A moist sand occupies a depth of 150 mm and when fully saturated it occupies 120 mm. Then the bulking of the moist sand is	<p>1. 10% 2. 15% 3. 20% 4. 25%</p>
The stresses caused by different loads can be superimposed in	<p>1. Working stress design 2. Ultimate strength design 3.</p>

	<p>Limit state design</p> <p>4. Plastic design</p>
A parabolic tendon in prestressed beam causes an equivalent balancing	<p>1. Concentrated shear force</p> <p>2. Constant moment</p> <p>3. Distributed force</p> <p>4. Uniformly distributed force</p>
The approximate loss of prestress due to creep in steel in prestressed concrete is about	<p>1. 1%</p> <p>2. 3%</p> <p>3. 6%</p> <p>4. 10%</p>
The amount of slip from friction wedges holding the wires may be taken on an average as	<p>1. 1 mm</p> <p>2. 2.5 mm</p> <p>3. 5 mm</p> <p>4. 10 mm</p>
Spalling stresses are produced because of	<p>1. Bursting force</p> <p>2. Inadequate anchor block</p> <p>3.</p>

	<p>Insufficient bond length</p> <p>4.High concentrated tendon force</p>
The size of the anchor plate in post-tensioned prestressed concrete structures depends upon	<p>1. Bearing capacity of the concrete</p> <p>2. Prestressing force</p> <p>3. Stress in the cable and bearing stress of the concrete</p> <p>4. Prestressing force bearing capacity of the concrete</p>
The minimum cover in any post-tensioned prestressed concrete member protected from direct weather is the greater of the cable or	<p>1. 15 mm</p> <p>2. 20 mm</p> <p>3. 25 mm</p> <p>4. 30 mm</p>
The minimum cover in any post-tensioned prestressed concrete member protected from direct weather is the greater of the cable or	<p>1. 15 mm</p> <p>2. 20 mm</p> <p>3. 25 mm</p> <p>4. 30 mm</p>
The grouting of ducts in post-tensioned prestressed concrete works should be done under a pressure of about (in MPa)	<p>1. 0.5</p> <p>2. 0.7</p> <p>3. 1.2</p> <p>4.</p>

	1.7
The strength of a fillet weld is	<p>1. About 80 to 95% of the main member</p> <p>2. Equal to that of the main member</p> <p>3. More than that of the main member</p> <p>4. Equal to or more than that of the main member</p>
In a grillage foundation the maximum shear force occurs	<p>1. At the edge of grillage beam</p> <p>2. At the centre of grillage beam</p> <p>3. At the edge of base plate</p> <p>4. At the centre of base plate</p>
Web crippling in beams generally occurs at the points where	<p>1. Bending moment is maximum</p> <p>2. Shear force is maximum</p> <p>3. Concentrated loads act</p> <p>4. Deflection is maximum</p>
The sag tie in a truss is mainly used to reduce	<p>1. Tension</p> <p>2. Compression</p>

3.
Moment and deflection

4.
Weight of the truss

1.
Square

2.
Circular

3.
Channel

4.
Tubular

1.
12.5%

2.
37.5%

3.
25%

4.
50%

1.
Stationary soil

2.
Static soil

3.
Residual soil

4.
Immobile soil

The most economical section for a column is

A moist sample of soil weighs 24g in a tin lid. The tin lid above weighs 14 g. Oven dry weight of tin and sample is 22g. What is the water content of the soil?

If the soil stays at a place above the parent rock where it is produced, that it is called

<p>Shearing strength of cohesionless soil depends upon</p>	<ol style="list-style-type: none"> 1. Dry density 2. Void ratio 3. Loading rate 4. Normal stress
<p>The maximum differential settlement in case of foundation on clayey soils is restricted to</p>	<ol style="list-style-type: none"> 1. 10 mm 2. 20 mm 3. 30 mm 4. 40 mm
<p>Compaction of soil is aimed at</p>	<ol style="list-style-type: none"> 1. Decreasing dry density 2. Increasing porosity 3. Decreasing void ratio 4. Decreasing shear strength
<p>The ratio of settlement at any time t, to the final settlement is called as</p>	<ol style="list-style-type: none"> 1. Percentage settlement 2.

	<p>Partial settlement ratio</p> <p>3.</p> <p>Degree of consolidation</p> <p>4.</p> <p>Residual consolidation</p>
Black cotton soil is not suitable for foundations because of its	<p>1.</p> <p>Black colour</p> <p>2.</p> <p>Low bearing capacity</p> <p>3.</p> <p>Cohesive particles</p> <p>4.</p> <p>Swelling and shrinkage nature</p>
Drainage conditions during test can be controlled best in	<p>1.</p> <p>Direct shear test</p> <p>2.</p> <p>Vane shear test</p> <p>3.</p> <p>Unconfined compression test</p> <p>4.</p> <p>Triaxial shear test</p>
Negative skin friction is to be considered when	<p>1.</p> <p>Fill settles relative to pile</p> <p>2.</p> <p>Pile settles relative to fill</p> <p>3.</p> <p>Fill and pile settle together</p> <p>4.</p>

	Water table rises
The seepage flow through a porous medium is generally	<ol style="list-style-type: none"> 1. Turbulent 2. Super critical 3. Transitional 4. Laminar
A major river basin is divided into four sub-basin with areas of 900, 700, 1000 and 1400 km ² respectively. If the average annual rainfalls on the sub-basins are 100,80, 100 and 110 cm respectively, what is the rainfall for the basin as a whole?	<ol style="list-style-type: none"> 1. 85 cm 2. 95 cm 3. 100 cm 4. 105 cm
The unit hydrograph is the graphical relation between	<ol style="list-style-type: none"> 1. Total rainfall and the total runoff 2. Total rainfall and the direct runoff 3. Effective rainfall and the total runoff 4. Effective rainfall and the direct runoff
At what fraction of depth below the free surface does the average velocity occur in open channel flow	<ol style="list-style-type: none"> 1. 0.2

	<p>2. 0.4</p> <p>3. 0.6</p> <p>4.0.8</p>
The duty at the field of a crop is 1000 hectares/cumec. If the canal losses are 25 %, what is the duty at the head of the canal?	<p>1. 750</p> <p>2. 1250</p> <p>3. 250</p> <p>4. 800</p>
A canal meant to convey water from one source to the other is known as	<p>1. Feeder canal</p> <p>2. Perennial canal</p> <p>3. Commuter canal</p> <p>4. Link canal</p>
The ordinate of the instantaneous unit hydrograph is proportional to	<p>1. The ordinate of S-curve hydrograph</p> <p>2. The slope of S-curve hydrograph</p> <p>3. Inverse of the ordinate of S-curve hydrograph</p> <p>4. Inverse of the slope of S-curve hydrograph</p>

1.
90 h

2.
84 h

3.
72 h

4.
168 h

1.
0.1 mg/l

2.
10 mg/l

3.
100 mg/l

4.
400 mg/l.

1.
6 mg/l

2.
894 mg/l

3.
900 mg/l

4.
2400 mg/l

1.
Drinking

2.

The base period of a 6 h unit hydrograph of a basin is 84 h. Then the base period of a 12 h unit hydrograph of the same basin will be

If 20 ml of 0,02 H₂SO₄ is needed to produce methyl orange end point with 200 ml of water sample, then the total alkalinity of the water sample is

A waste water sample of 2 ml is made upto 300ml in a BOD bottle with distilled water. Initial D.O. of the sample is 8 and after 5 days it is 2. Therefore its BOD is

Absolutely soft waters are required for

Boilers

3.
Prevention of corrosion in pipes
4.
Washing with synthetic detergent soap.

**1.
Slow sand filter**

2.
Rapid sand filter
3.
Pressure filter
4.
Slow and rapid sand filter

1.
0.1 mg/l

2.
0.2 mg/l

3.
1mg/l
4.
More than 3 mg/l

1.
Supply hours can be staggard for different zones of different elevations

2.
Less quantity of water shall be sufficient
3.
Wastage is quite less

Coagulant may not be added for treatment before

The usual amount of residual chlorine required after 10 minutes of contact is

Intermittent system is more popular in India because

	<p>4. It is highly economical in the long run</p>
Efficiency of activated sludge process is	<p>1. 30 to 40 %</p> <p>2. 50 to 60%</p> <p>3. 60 to 98%</p> <p>4. 90 to 95 %</p>
Activated sludge process is a biological process involving	<p>1. Aerobic + anaerobic bacteria</p> <p>2. Aerobic bacteria+ protozoa +algae</p> <p>3. Anaerobic bacteria + fungi</p> <p>4. Facultative bacteria + algae</p>
The factor deciding the length of a grit chamber is	<p>1. Detention period</p> <p>2. Horizontal velocity of flow</p> <p>3. Settling velocity</p> <p>4. Surface loading</p>

<p>A lamp post at the edge of the pavement reduces the capacity of the lane to</p>	<ol style="list-style-type: none"> 1. 92% 2. 83% 3. 72% 4. 61%
<p>Bitumen stabilisation acts as a</p>	<ol style="list-style-type: none"> 1. Hydrophilic medium 2. Adhesive for coarse grains and water proofing agent for fine grains 3. Destroyer of organic matter and hence more strength 4. Thin cover that gets oxidised in a few days.
<p>The minimum radius for intersection curve when the speed is 35 kmph is</p>	<ol style="list-style-type: none"> 1. 15 m 2. 25 m 3. 35 m 4. 50 m
<p>Centre line for an urban road of more than 4 lanes is</p>	<ol style="list-style-type: none"> 1. Broken line 2. 3 m long broken line with a gap of 4.5 m in between lines 3. Continuous thick line 4. Two thick parallel lines with a gap of 75 mm in between.

<p>In full grouted method of construction of Bituminous roads, bitumen is applied at the rate of</p>	<ol style="list-style-type: none"> 1. 1 to 2 kg/m² 2. 4 to 8 kg/m² 3. 8 to 14 kg/m² 4.10 to 20 kg/m²
<p>A rising gradient of 1 in 50 meets a falling gradient of 1 in 500. The length of the vertical curve if the rate of change of gradient is 1% per 100 m.</p>	<ol style="list-style-type: none"> 1. 45.45 m 2. 180 m 3. 200 m 4. 220 m
<p>Consider the following statements regarding an impulse turbine:</p> <ol style="list-style-type: none"> 1. Relative velocity at the inlet and exit of the rotor blades are the same. 2. Absolute velocity at the inlet and exit of the rotor blades are the same. 3. Static pressure within the rotor blade channel is constant. 4. Total pressure within the rotor blade channel is constant. <p>Of these statements:</p>	<ol style="list-style-type: none"> 1. 1 and 3 are correct 2. 2 and 3 are correct 3. 1 and 4 are correct 4. 2 and 4 are correct
<p>The insulation ability of an insulator in the presence of moisture would</p>	<ol style="list-style-type: none"> 1. remain unaffected 2. increase 3. decrease 4.

	be unpredictable
In a pin jointed frame the members meeting at a joint must be so arranged that	<p>1.The axes of all the members are concurrent and coplanar</p> <p>2.Not more than two axes meet at a point</p> <p>3.The axes must be parallel to each other</p> <p>4. At least three axes meet at a common point</p>
A typical set of mechanical working drawings includes _____	<p>1. exploded assembly</p> <p>2. part details</p> <p>3.parts list</p> <p>4. all the above</p>