Andhra Pradesh State Council of Higher Education

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	Mechanical Engineering 19th July 2022 Shift 2
Duration :	120
Total Marks :	120
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

Mechanical Engineering

Section Id :	90030014
Section Number :	1
Mandatory or Optional :	Mandatory
Number of Questions :	120
Section Marks :	120
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0

Question Number : 1 Question Id : 9003001561 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following statements is correct?

Options :

1. ✔ Energy and work are scalars

2. ✖ Force and work are vectors

3. ✖ Energy, momentum, and velocity are vectors

4. ✖ Force, momentum, and velocity are scalar.

Question Number : 2 Question Id : 9003001562 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the following statements:

A. Two couples in the same plane can be added algebraically

B. Coplanar and concurrent forces are the ones which do neither lie in one plane nor meet at a point

C. Non-concurrent forces are the ones which do not meet at a point.

D. A single force may be replaced by a force and couple.

Which of the following statements are correct?

Options :

1. ✖ A, B and D

2. ✖ B, C and D

3. ✖ A, B and C

4. ✔ A, C and D

Question Number : 3 Question Id : 9003001563 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If a system is in equilibrium and the position of the system depends upon many independent variables, the principle of virtual work states that the partial derivatives of its total potential energy with respect to each of the independent variable must be

Options :

1. ✖ -1.0

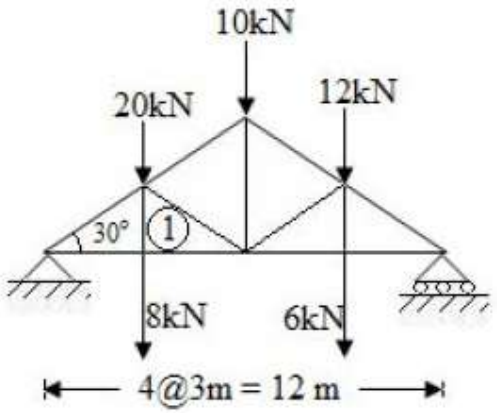
2. ✔ 0

3. ✖ 1.0

4. ✖ ∞

Question Number : 4 Question Id : 9003001564 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The force in the member 1 of the truss shown in the figure is



Options :

1. ✖ 12 kN compressive

2. ✖ 28 kN tensile

3. ✔ 8 kN tensile

4. ✖ 20 kN compressive

Question Number : 5 Question Id : 9003001565 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A wheel of mass m and radius r is in accelerated rolling motion without slip under a steady axle torque T.

If the coefficient of kinetic friction is μ, the friction force from the ground on the wheel is

Options :

1. ✔ μ mg

2. ✖ T/r

3. ✖ zero

4. ✖ r/T

Question Number : 6 Question Id : 9003001566 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Two identical circular rods of the 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 a modulus of elasticity of 206 GPa. The other rod is made out of cast iron having thaodulus 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?

Options :

1. ✖ Both rods elongate by the same amount

2. ✖ Mild steel rod elongates more than the cast iron rod

3. ✔ Cast iron rod elongates more than the mild steel rod

4. ✖ As the stresses are equal strains are also equal in both the rods

Question Number : 7 Question Id : 9003001567 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An axial residual compressive stress due to a manufacturing process is present on the outer surface of a rotating shaft subjected to bending. Under a given bending load, the fatigue life of the shaft in the presence of the residual compressive stress is:

Options :

1. ✖ Decreased

2. ✖ Increased or decreased, depending on the external bending load

3. ✖ Neither decreased nor increased

4. ✔ Increased

Question Number : 8 Question Id : 9003001568 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The dimensional formula for entropy is

Options :

1. ✖ $MLT^{-2}K$

2. ✖ ML^0T^{-2}

3. ✔ $ML^2T^{-2}K^{-1}$

4. ✖ $ML^2T^{-2}K$

Question Number : 9 Question Id : 9003001569 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following statements is correct? If a material expands freely due to heating, it will develop

Options :

1. ✖ Thermal stress

2. ✖ Tensile stress

3. ✖ Compressive stress

4. ✔ No stress

Question Number : 10 Question Id : 9003001570 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The minimum number of links in a constrained planar mechanism involving two higher pairs is

Options :

1. ✖ 2

2. ✖ 3

3. ✔ 4

4. ✖ 5

Question Number : 11 Question Id : 9003001571 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A closed kinematic chain made out of three links and three-pin joints may be called

Options :

1. ✖ a three-bar mechanism

2. ✖ a simple mechanism

3. ✔ a frame

4. ✖ a successfully constrained mechanism

Question Number : 12 Question Id : 9003001572 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the following mechanisms

(A) Geneva mechanism (B) A pair of gears (C) Cam and follower mechanism

Which of the above involves 3 links?

Options :

1. ✖ A and B

2. ✖ B and C

3. ✖ A and C

4. ✔ A.B and C

Question Number : 13 Question Id : 9003001573 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An idler in a simple gear train

Options :

1. ✖ affects only the speed ratio of the train

2. ✔ affects only the sense of rotation of the output gear

3. ✖ affects the speed ratio and also the sense of rotation of the output gear

4. ✖ affects neither the speed ratio nor the sense of rotation of the output gear

Question Number : 14 Question Id : 9003001574 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a slider-crank mechanism, the instantaneous center of crank and connecting rod is

Options :

1. ✔ the crankpin center

2. ✖ the piston pin center

3. ✖ at infinity on the line perpendicular to the line of motion of the piston

4. ✖ the crankshaft center

Question Number : 15 Question Id : 9003001575 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The velocity diagram of a four-bar mechanism is

Options :

1. ✖ a quadrilateral similar to the quadrilateral formed by the mechanism

2. ✔ a triangle

3. ✖ either an equilateral triangle or an isosceles triangle depending on the angular velocity of the input link

4. ✖ a straight line itself

Question Number : 16 Question Id : 9003001576 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The motion between two gear teeth in the mesh is

Options :

1. ✖ simple sliding only

2. ✖ rolling only

3. ✔ rolling associated with sliding

4. ✖ either rolling or sliding

Question Number : 17 Question Id : 9003001577 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A vibrating system with a damping factor of 0.23, is excited by a harmonic force. If the non-dimensional frequency ratio is 0.64, what is the phase difference between the force of excitation and the displacement of the mass?

Options :

1. ✖ 18.40

2. ✔ 26.50

3. ✖ 29.30

4. ✖ 34.70

Question Number : 18 Question Id : 9003001578 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A vibrating system is in a state of resonance. What is the phase difference?

Options :

1. ✖ 0

2. ✖ 450

3. ✔ 900

4. ✖ 1800

Question Number : 19 Question Id : 9003001579 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A shaft is carrying a flywheel. If the flywheel is replaced by another flywheel whose weight is half of the first one, then the critical speed of the shaft

Options :

1. ✖ gets doubled

2. ✔ increases by 1.414 times

3. ✖ decreases by 0.707 times

4. ✖ gets halved

Question Number : 20 Question Id : 9003001580 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The critical speed of the shaft may be reduced by

Options :

1. ✖ reducing the distance between the bearings

2. ✔ reducing the diameter of the shaft

3. ✖ increasing the diameter of the shaft

4. ✖ using long bearings

Question Number : 21 Question Id : 9003001581 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A shaft is supported on two bearings which are 750mm apart. If there is an unbalance couple of magnitude 1755 N.m exists on the shaft, what would be the magnitude of dynamic reactions at each bearing?

Options :

1. ✖ 585N

2. ✖ 1170N

3. ✔ 2340N

4. ✖ 4680N

Question Number : 22 Question Id : 9003001582 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 0.347

2. ✖ 0.954

3. ✔ 1.016

4. ✖ 1.302

Question Number : 23 Question Id : 9003001583 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time :

N.A Think Time : N.A Minimum Instruction Time : 0

Rankine's theory of failure is applicable to

Options :

1. ✖ ductile materials

2. ✖ elastic materials

3. ✔ brittle materials

4. ✖ plastic materials

Question Number : 24 Question Id : 9003001584 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Coulomb, Tresca and Guest's theory of failure is applicable to

Options :

1. ✔ ductile materials

2. ✖ composites

3. ✖ brittle materials

4. ✖ non-metals

Question Number : 25 Question Id : 9003001585 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Distortion energy theory of failure is applicable to

Options :

1. ✔ components made of plain carbon steel

2. ✖ components made of composites

3. ✖ components made of cast iron

4. ✖ components made of polymers

Question Number : 26 Question Id : 9003001586 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the fusion welding process

Options :

1. ✔ only heat is used

2. ✖ only pressure is used

3. ✖ combination of heat and pressure is used

4. ✖ all three methods are used

Question Number : 27 Question Id : 9003001587 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The purpose of circumferential lap joint in boiler shell is

Options :

1. ✖ to make cylindrical ring from steel plate

2. ✔ to increase the length of boiler shell by connecting one ring to another

3. ✖ to make diameter and length of boiler shell

4. ✖ to connect openings to shell

Question Number : 28 Question Id : 9003001588 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The clutch used in trucks is

Options :

1. ✖ centrifugal clutch

2. ✖ cone clutch

3. ✖ multi-plate clutch

4. ✔ single plate clutch

Question Number : 29 Question Id : 9003001589 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When the frictional force helps to apply the brake, the brake is said to be

Options :

1. ✔ partially self-energizing

2. ✖ self-locking

3. ✖ back-stop

4. ✖ self-acting

Question Number : 30 Question Id : 9003001590 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When the axes of two shafts are perpendicular and intersecting, use

Options :

1. ✖ spur gears

2. ✔ bevel gears

3. ✖ worm gears

4. ✖ helical gears

Question Number : 31 Question Id : 9003001591 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the surface tension of the water-air interface is 0.073 N/m, the gauge pressure inside a raindrop of 1 mm diameter will be

Options :

1. ✖ $0.146\ N/m^2$

2. ✖ $73\ N/m^2$

3. ✖ $146\ N/m^2$

4. ✔ $292\ N/m^2$

Question Number : 32 Question Id : 9003001592 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When the pressure on a given mass of liquid is increased from 3.0 MPa to 3.5 MPa, the density of the liquid increases from 500 kg/m^3 to 501 kg/m^3.What is the average value of bulk modulus of the liquid over the given pressure range?

Options :

1. ✖ 700 MPa

2. ✖ 600MPa

3. ✖ 500MPa

4. ✔ 250MPa

Question Number : 33 Question Id : 9003001593 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is the condition for stable equilibrium for a floating body'

Options :

1. ✖ The metacenter coincides with the center of gravity

2. ✖ The metacenter is below the center of gravity

3. ✔ The metacenter is above the center of gravity

4. ✖ The center of buoyancy is below the center of gravity

Question Number : 34 Question Id : 9003001594 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Match List-I (Pipe flow) with List-II (Type of acceleration) and select the correct answer:

List-I	List-II
A. Flow at constant rate passing through a bend	*P*. Zero acceleration
B. Flow at constant rate passing through a straight uniform diameter pipe	*Q*. Local and convective acceleration
C. Gradually changing flow through a bend	*R*. Convective acceleration
D. Gradually changing flow through a straight pipe	*S*. Local acceleration

Choose the correct sequence from below A-B-C-D

Options :

1. ✔ *R* *P* *Q* *S*

2. ✖ *R* *P* *S* *Q*

3. ✖ *P* *Q* *R* *S*

4. ✖ *P* *R* *S* *Q*

Question Number : 35 Question Id : 9003001595 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When a liquid and its vapour are in equilibrium at a certain pressure and temperature, then

which of the following is required to identify the saturation state.

Options :

1. ✖ pressure

2. ✖ temperature

3. ✖ both pressure and temperature

4. ✔ pressure or temperature

Question Number : 36 Question Id : 9003001596 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The continuity equation for a steady flow states that

Options :

1. ✖ Velocity field is continuous at all points in flow field

2. ✖ The velocity is tangential to the streamlines.

3. ✔ The stream function exists for steady flows.

4. ✖ The net efflux rate of mass through the control surfaces is zero

Question Number : 37 Question Id : 9003001597 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The thermal efficiency of diesel cycle having fixed cut-off ratio, with an increase in compression ratio

Options :

1. ✖ Increases

2. ✖ Decreases

3. ✖ Independent

4. ✔ Cannot be determined

Question Number : 38 Question Id : 9003001598 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider an incompressible laminar boundary layer flow over a flat plate of length L, aligned with the direction of an oncoming uniform free stream. If F the ratio of the drag force on the front half of the plate to the drag force on the rear half, then

Options :

1. ✖ $F<1/2$

2. ✖ $F = ½$

3. ✖ $F = 1$

4. ✔ $F > 1$

Question Number : 39 Question Id : 9003001599 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Boundary layer flow separation is likely to take place when the pressure gradient in the direction of flow is

Options :

1. ✖ Zero

2. ✔ Adverse

3. ✖ Slightly favourable

4. ✖ Strongly favourable

Question Number : 40 Question Id : 9003001600 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Flow takes place and Reynolds Number of 1500 in two different pipes with relative roughness of 0.001 and 0.002. The friction factor

Options :

1. ✖ Will be higher in the case of pipe with relative roughness of 0.001.

2. ✖ Will be higher in the case of pipe having relative roughness of 0.002.

3. ✔ Will be the same in both the pipes.

4. ✖ In the two pipes cannot be compared on the basis of data given

Question Number : 41 Question Id : 9003001601 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time :

N.A Think Time : N.A Minimum Instruction Time : 0

Water at 25^0C is flowing through a 1 k.m long G.I. pipe of 200 mm diameter at the rate of $0.07\ m^2/s$. If the value of Darcy friction factor for this pipe is 0.02 and the density of water is $1000\ kg/m^3$, the pumping power (in Kw) required to maintain the flow is

Options :

1. ✖ 1.8

2. ✔ 17.4

3. ✖ 32

4. ✖ 41

Question Number : 42 Question Id : 9003001602 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a case of one-dimensional heat conduction in a medium with constant properties, T is the temperature at position x, at time t. Then $(\partial T/\partial t)$ is proportional to:

Options :

1. ✖ T/x

2. ✖ $\partial T/\partial x$

3. ✖ $(\partial^2 T/\partial x \partial t)$

4. ✔ $(\partial^2 T/\partial x^2)$

Question Number : 43 Question Id : 9003001603 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As temperature increases, the thermal conductivity of gas

Options :

1. ✔ increases

2. ✖ decreases

3. ✖ remains constant

4. ✖ increases up to certain temperature and then decreases

Question Number : 44 Question Id : 9003001604 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

With an increase in the thickness of insulation around a circular pipe, heat loss to surrounding due to

Options :

1. ✖ convection increase, while that the due to conduction decreases

2. ✔ convection decrease, while that due to conduction increases

3. ✖ convection and conduction decreases

4. ✖ convection and conduction increases

Question Number : 45 Question Id : 9003001605 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

It is proposed to coat a 1 mm diameter wire with enamel paint ($k = 0.1$ W/mK) to increase heat transfer with air. If the air side heat transfer coefficient is 100 W/m^{2}K, then optimum thickness of enamel paint should be

Options :

1. ✖ 0.25 mm

2. ✔ 0.5 mm

3. ✖ 1 mm

4. ✖ 2 mm

Question Number : 46 Question Id : 9003001606 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A fin has 5mm diameter and 100 mm length. The thermal conductivity of fin material is 400 $Wm^{-1}K^{-1}$. One end of the fin is maintained at 130°C and its remaining surface is exposed to ambient air at 30°C. If the convective heat transfer coefficient is 40 $Wm^{-2}K^{-1}$, the heat loss (in W) from the fin is

Options :

1. ✖ 0.08

2. ✔ 5.0

3. ✖ 7.0

4. ✖ 7.8

Question Number : 47 Question Id : 9003001607 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following configurations has the highest fin effectiveness?

Options :

1. ✔ Thin, closely spaced fins

2. ✖ Thin, widely spaced fins

3. ✖ Thick, widely spaced fins

4. ✖ Thick, closely spaced fins

Question Number : 48 Question Id : 9003001608 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A wet vapour can be completely specified by

Options :

1. ✖ Pressure only

2. ✖ Temperature only

3. ✖ Dryness fraction only

4. ✔ Pressure and dryness fraction.

Question Number : 49 Question Id : 9003001609 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Pressure of an ideal gas is increased by keeping temperature constant. The kinetic energy of molecules

Options :

1. ✖ Decreases

2. ✖ Increases

3. ✔ Remains same

4. ✖ Increases or decreases depending on the nature of gas

Question Number : 50 Question Id : 9003001610 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For water, at pressures below atmospheric

Options :

1. ✔ Melting point rises slightly and boiling point drops markedly

2. ✖ Melting point rises markedly and boiling point drops slightly

3. ✖ Melting point drops slightly and boiling point drops markedly

4. ✖ Melting point drops markedly and boiling point drops slightly.

Question Number : 51 Question Id : 9003001611 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the radiation heat exchange inside an annulus between two very long concentric cylinders. The radius of the outer cylinder is R_o and that of the inner cylinder is R_i. The radiation view factor of the outer cylinder onto itself is

Options :

1. ✖ $1-\sqrt{\frac{R_i}{R_o}}$

2. ✖ $\sqrt{1-\frac{R_i}{R_o}}$

3. ✖ $1-\left(\frac{R_i}{R_o}\right)^{1/3}$

4. ✔ $1-\frac{R_i}{R_o}$

Question Number : 52 Question Id : 9003001612 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The total emissive power of a surface is 500 W/m^2 at a temperature T_1 and 1200 W/m^2 at a temperature T_2, where the temperatures are in Kelvin. Assuming the emissivity of the surface to be constant, the ratio of the temperatures $\frac{T_1}{T_2}$ is

Options :

1. ✖ 0.308

2. ✖ 0.416

3. ✔ 0.803

4. ✖ 0.874

Question Number : 53 Question Id : 9003001613 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For flow of fluid over a heated plate, the following fluid properties are known Viscosity = 0.001Pa-s;

Specific heat at constant pressure = 1 kJ/kg. K; Thermal conductivity = 1W/m- K.

The hydrodynamic boundary layer thickness at a specified location on the plate is 1 mm.

The thermal boundary layer thickness at the same location is

Options :

1. ✖ 0.001 mm

2. ✖ 0.01 mm

3. ✔ 1 mm

4. ✖ 1000 mm

Question Number : 54 Question Id : 9003001614 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the same inlet and outlet temperatures of hot and cold fluids, the Log Mean Temperature Difference (*LMTD*) is

Options :

1. ✖ Greater for parallel flow heat exchanger than for counter flow heat exchanger.

2. ✔ Greater for counter flow heat exchanger than for parallel flow heat exchanger.

3. ✖ Same for both parallel and counter flow heat exchangers.

4. ✖ Dependent on the properties of the fluids.

Question Number : 55 Question Id : 9003001615 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Hot oil is cooled from 80 to 50^0C in an oil cooler which uses air as the coolant. The air temperature rises from 30 to 40^0C. The designer uses a LMTD value of 26^0C. The type of heat exchange is

Options :

1. ✖ parallel flow

2. ✖ double pipe

3. ✖ counter flow

4. ✔ cross flow

Question Number : 56 Question Id : 9003001616 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Heat and work are

Options :

1. ✖ Intensive properties

2. ✖ Extensive properties

3. ✖ Point Functions

4. ✔ Path functions

Question Number : 57 Question Id : 9003001617 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Heat flow into a system is ____, and heat flow out of the system is

Options :

1. ✖ positive, positive

2. ✖ negative, negative

3. ✖ negative, positive

4. ✔ positive, negative

Question Number : 58 Question Id : 9003001618 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is true according to Clausius statement?

Options :

1. ✖ it is possible to construct a device that can transfer heat from a cooler body to a hotter body without any effect

it is impossible to construct a device that can transfer heat from a cooler body to a hotter body without any effect

it is impossible to construct a device that can transfer heat from a hotter body to a cooler body without any effect

it is impossible to construct a device that can transfer heat from a cooler body to a hotter body with any effect

Question Number : 59 Question Id : 9003001619 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Gas turbine works on

Options :

1. Ericsson cycle
2. Rankine cycle
3. Brayton cycle
4. Stirling cycle

Question Number : 60 Question Id : 9003001620 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the same maximum and minimum temperatures, the Rankine cycle has

Options :

1. more efficiency than that of Carnot cycle

2. ✖ lower specific work output than that of Carnot cycle

3. ✖ equal efficiency than that of Carnot cycle

4. ✔ higher specific work output than that of Carnot cycle

Question Number : 61 Question Id : 9003001621 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Thermal efficiency of heat engine cycle is defined as

Options :

1. ✖ Net Work input / Total Heat output

2. ✔ Net Work output / Total Heat input

3. ✖ Total Heat output / Net Work input

4. ✖ Total Heat input / Net Work output

Question Number : 62 Question Id : 9003001622 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not a necessary assumption for the air standard Otto cycle

Options :

1. ✖ The working fluid is an ideal gas with constant specific heat.

2. ✔ Intake and exhaust processes are constant volume heat rejection process.

3. ✖ All the thermodynamic processes are internally and externally reversible.

4. ✖ The combustion process is a constant volume heat addition process.

Question Number : 63 Question Id : 9003001623 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the same compression ratio and heat addition, the efficiency order of Otto, dual and diesel cycle is

Options :

1. ✖ $\eta_{otto} > \eta_{diesel} > \eta_{dual}$

2. ✖ $\eta_{diesel} > \eta_{otto} > \eta_{dual}$

3. ✔ $\eta_{otto} > \eta_{dual} > \eta_{diesel}$

4. ✖ $\eta_{diesel} > \eta_{dual} > \eta_{otto}$

Question Number : 64 Question Id : 9003001624 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the ratio of isentropic work to Euler work in an centrifugal compressor called?

Options :

1. ✖ Work coefficient

2. ✖ Velocity coefficient

3. ✔ Pressure coefficient

4. ✖ Flow coefficient

Question Number : 65 Question Id : 9003001625 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Where is air refrigeration cycle commonly used?

Options :

1. ✖ car air conditioning

2. ✖ domestic refrigerator

3. ✔ aircraft air conditioning

4. ✖ cold storage

Question Number : 66 Question Id : 9003001626 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In gas cycle refrigeration system, the throttle valve of a vapour compression refrigerant system is replaced by

Options :

1. ✖ capillary tube

2. ✔ Expander

3. ✖ reverse throttle valve

4. ✖ Capillary tube followed by expander

Question Number : 67 Question Id : 9003001627 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How is the efficiency of the SI engine affected by the change in the specific heat ratio of working fluid?

Options :

1. ✖ The efficiency of SI engine increase with a decrease in specific heat ratio of working fluid

2. ✖ The efficiency of SI engine decreases with an increase in the specific heat ratio of working fluid

3. ✔ The efficiency of SI engine increases with an increase in specific heat ratio of working fluid

4. ✖ The efficiency of the SI engine does not affect by a change in the specific heat ratio of working fluid

Question Number : 68 Question Id : 9003001628 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Damping has its predominant effect

Options :

1. ✖ for small values of frequency of excitation

2. ✖ for large values of frequency of excitation

3. ✔ in the resonance zone

4. ✖ in the isolation zone

Question Number : 69 Question Id : 9003001629 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The method of increasing the air capacity of an engine is known as

Options :

1. ✔ Supercharging

2. ✖ VCR Engine

3. ✖ Detonation

4. ✖ Scavenging

Question Number : 70 Question Id : 9003001630 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As the engine speed increases, flow rate increases with a corresponding increase in

A) swirl B) squish C) turbulence D) Viscosity

Choose the correct one from the below

Options :

1. ✖ A only

2. ✖ A,B and D only

3. ✔ A,B and C only

4. ✖ B only

Question Number : 71 Question Id : 9003001631 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following has poorest weldability

Options :

1. ✖ Low carbon steel

2. ✖ Medium carbon steel

3. ✔ High carbon steel

4. ✖ Wrought iron

Question Number : 72 Question Id : 9003001632 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Atomic packing factor in the case of copper crystal is

Options :

1. ✖ 0.52

2. ✔ 0.74

3. ✖ 0.68

4. ✖ 0.74

Question Number : 73 Question Id : 9003001633 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The eutectoid of carbon in iron, above lower critical temperature ,when cooled result in

Options :

1. ✖ Ferrite and Austenite
2. ✔ Ferrite and cementite
3. ✖ cementite and Austenite
4. ✖ Ferrite, cementite and Austenite

Question Number : 74 Question Id : 9003001634 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Delta iron occur between the temperature range of (in ^{0}C)

Options :

1. ✖ 400^0-1600^0
2. ✖ 600^0-900^0
3. ✖ 900^0-1400^0
4. ✔ 1400^0-1530^0

Question Number : 75 Question Id : 9003001635 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The material property which depends only on the crystal structure is

Options :

1. ✖ Fatigue strength

2. ✖ Work hardening

3. ✔ Fracture strength

4. ✖ Elastic constant

Question Number : 76 Question Id : 9003001636 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following materials is used in the manufacture of extrusion nozzles

Options :

1. ✔ White cast iron

2. ✖ Malleable cast iron

3. ✖ Grey cast iron,

4. ✖ Nodular cast iron

Question Number : 77 Question Id : 9003001637 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Riser is designed so as to

Options :

1. ✔ Freeze after the casting freezes

2. ✖ Freezing before the casting freezes

3. ✖ Freeze at the same as the casting

4. ✖ Minimize the time of pouring

Question Number : 78 Question Id : 9003001638 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Chills are used in moulds to

Options :

1. ✔ Achieve directional solidification

2. ✖ Reduce the possibility of blow holes

3. ✖ Reduce the freezing time

4. ✖ Smoothen the metal for reducing spatter.

Question Number : 79 Question Id : 9003001639 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A part produced by Powder metallurgy is termed as

Options :

1. ✖ Welded part

2. ✖ Cast part

3. ✖ Forging part

4. ✔ Sintered part

Question Number : 80 Question Id : 9003001640 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following method is used to make powder for brittle metals?

Options :

1. ✔ Mechanical pulverisation

2. ✖ Electrolytic process

3. ✖ Chemical reduction

4. ✖ Atomization

Question Number : 81 Question Id : 9003001641 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which method is used to make powder of metals having low melting point?

Options :

1. ✖ Mechanical pulverisation

2. ✖ Electrolytic process

3. ✖ Chemical reduction

4. ✔ Atomization

Question Number : 82 Question Id : 9003001642 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Worm working or semi-hot working process, which is the plastic deformation of metal or alloy under conditions of temperature and strain rate, is performed to eliminate drawbacks of

Options :

1. ✖ cold working process

2. ✖ hot working process

3. ✔ both cold and hot working processes

4. ✖ Quenching

Question Number : 83 Question Id : 9003001643 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The process of formation of new grains is known as

Options :

1. ✖ Pre-crystallization

2. ✔ Re-crystallization

3. ✖ Crystallization

4. ✖ Post-crystallization

Question Number : 84 Question Id : 9003001644 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time :

N.A Think Time : N.A Minimum Instruction Time : 0

The metal joined is never brought to a molten stage in

Options :

1. ✔ pressure welding

2. ✖ fusion welding

3. ✖ thermit welding

4. ✖ non pressure welding

Question Number : 85 Question Id : 9003001645 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As compared to the arc welding, the gas welding takes

Options :

1. ✖ considerably less time for the metal to heat up

2. ✔ considerably more time for the metal to heat up

3. ✖ approximately same time for the metal to heat up as arc welding

4. ✖ unpredictable

Question Number : 86 Question Id : 9003001646 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In orthogonal cutting the, the depth of cut is halved and the feed rate is double. If the chip thickness ratio is unaffected by the changed cutting conditions, the actual chip thickness will be

Options :

1. ✔ doubled

2. ✖ halved

3. ✖ quadrupled

4. ✖ unchanged

Question Number : 87 Question Id : 9003001647 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In oblique cutting of metals, the cutting edge of the tool is

Options :

1. ✖ perpendicular to the workpiece

2. ✖ perpendicular to the direction of tool travel

3. ✖ parallel to the direction of tool travel

4. ✔ inclined at angle less than 90 degrees to the direction of tool travel

Question Number : 88 Question Id : 9003001648 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The factors responsible for the formation of discontinuous chips

Options :

1. ✖ low cutting speed and large rake angle

2. ✔ low cutting speed and small rake angle

3. ✖ high cutting speed and large rake angle

4. ✖ high cutting speed and small rake angle

Question Number : 89 Question Id : 9003001649 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a single point tool, the angle between the surface of the flank immediately below the point and a line drawn from the point perpendicular to base is known as

Options :

1. ✖ side relief angle

2. ✔ end relief angle

3. ✖ back rake angle

4. ✖ side rake angle

Question Number : 90 Question Id : 9003001650 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a machining operation, doubling the cutting speed reduces the tool life to $1/8^{th}$ of the original value. The exponent n in Taylor's tool life equation is

Options :

1. ✖ 1/8

2. ✖ 1/4

3. ✔ 1/3

4. ✖ 1/2

Question Number : 91 Question Id : 9003001651 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Brittle materials are machined with tool having zero or negative rake angles because

Options :

1. ✖ results in lower cutting force

2. ✖ improves surface finish

3. ✔ provides adequate strength to cutting forces

4. ✖ results in more accurate dimensions

Question Number : 92 Question Id : 9003001652 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Ultrasonic machining, the tooltip is attached to the tool cone by

Options :

1. ✖ welding

2. ✖ press fitting

3. ✔ silver soldering

4. ✖ riveting

Question Number : 93 Question Id : 9003001653 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Reproduction of sharp corners is the limitation of

Options :

1. ✖ ECM

2. ✔ EDM

3. ✖ laser

4. ✖ plasma

Question Number : 94 Question Id : 9003001654 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The degree of closeness of the measured value of a certain quantity with its true value is known as

Options :

1. ✔ Accuracy

2. ✖ Precision

3. ✖ Standard

4. ✖ Sensitivity

Question Number : 95 Question Id : 9003001655 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ability by which a measuring device can detect small differences in the quantity being measured by it, is called its

Options :

1. ✖ Damping

2. ✔ Sensitivity

3. ✖ Accuracy

4. ✖ Standard

Question Number : 96 Question Id : 9003001656 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A shaft rotating in a bushed bearing is good example of

Options :

1. ✖ Sliding fit

2. ✔ Running fit

3. ✖ Push fit

4. ✖ Driving fit

Question Number : 97 Question Id : 9003001657 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following is not used to measure angles

Options :

1. ✖ Bevel protectors

2. ✖ Calibrated levels

3. ✖ Clinometers

4. ✔ Optical flats

Question Number : 98 Question Id : 9003001658 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In V-shape method, the minor diameter of thread is given by_____ ,Where, D = Diameter of cylindrical gauge, d1 = micrometer reading of cylindrical gauge, d2 = micrometer reading of threads, d = minor diameter

Options :

1. ✔ $D \pm (d2 - d1)$

2. ✖ $D \pm (d1 - d2)$

3. ✖ $D \pm (d2 + d1)$

4. ✖ $D \pm (d2 / d1)$

Question Number : 99 Question Id : 9003001659 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is true for the calibration of instruments?

Options :

1. ✖ In casting and fabrication shops the measurements made are of more precise nature as compared to those made in machine shop and tool room

2. ✔ Periodical calibration is made for optical measuring instruments

3. ✖ There is no need of periodic calibration in universal microscope

4. ✖ Preventive maintenance is not necessary for optical measuring instruments

Question Number : 100 Question Id : 9003001660 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the generation of Coon's surface, we require

Options :

1. ✖ A set of grid points on the surface

2. ✖ A set of grid control points

3. ✔ Four bounding curves defining the surface

4. ✖ Two bounding curves and a set of grid control points

Question Number : 101 Question Id : 9003001661 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a CNC block, N002 G02 G91 X40 Z40……., G02 and G91 refer to

Options :

1. ✖ Circular interpolation in counter clockwise direction and incremental dimension

2. ✖ Circular interpolation in counter clockwise direction and absolute dimension

3. ✔ Circular interpolation in clockwise direction and incremental dimension

4. ✖ Circular interpolation in clockwise direction and absolute dimension

Question Number : 102 Question Id : 9003001662 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a maximization problem, the objective function coefficient for an artificial variable is

Options :

1. ✖ $+M$

2. ✔ $-M$

3. ✖ Zero

4. ✖ $\pm M$

Question Number : 103 Question Id : 9003001663 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An alternative optimal solution to a minimization transportation problem exists whenever

opportunity cost corresponding to unused route of transportation is

Options :

1. ✖ positive and greater than zero

2. ✔ positive with at least one equal to zero

3. ✖ negative with at least one equal to zero

4. ✖ negative with at least one not equal to zero

Question Number : 104 Question Id : 9003001664 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If an activity has zero slack, it implies that

Options :

1. ✔ it lies on the critical path

2. ✖ it is a dummy activity

3. ✖ the project is progressing well

4. ✖ It doesn't lie on the critical path

Question Number : 105 Question Id : 9003001665 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following techniques is used for determining allowances in time study

Options :

1. ✖ acceptance sampling

2. ✖ linear regression

3. ✖ performance rating

4. ✔ work sampling

Question Number : 106 Question Id : 9003001666 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The operation of producing grooves around the periphery of a cylindrical or conical work piece is called

Options :

1. ✖ Profile milling

2. ✖ Gang milling

3. ✖ Saw milling

4. ✔ Helical milling

Question Number : 107 Question Id : 9003001667 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The correct sequence of operations in production planning and control is

Options :

1. ✖ Scheduling-Routing- Dispatching-Follow up

2. ✖ Routing-Scheduling-Dispatching-Follow up

3. ✖ Dispatching-Routing-Scheduling- Follow up

4. ✔ Routing-Scheduling-Follow up-Dispatching

Question Number : 108 Question Id : 9003001668 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Managers typically do not use sophisticated planning models for aggregate planning because?

Options :

1. ✔ they view these models as overly complex and do not fully understand them.

2. ✖ research has demonstrated that such models seldom work well.

3. ✖ these models do not provide information pertinent to the decision at hand

4. ✖ the time periods addressed by such models are too long.

Question Number : 109 Question Id : 9003001669 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The transportation method of aggregate planning requires that?

Options :

1. ✖ beginning inventory be zero.

2. ✖ the number of rows be greater than the number of columns.

3. ✔ cost factors be linear and positive.

4. ✖ ending inventory be zero.

Question Number : 110 Question Id : 9003001670 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

To avoid excessive multiplication of facilities, the layout is preferred as

Options :

1. ✖ product layout.

2. ✖ group layout.

3. ✖ static layout.

4. ✔ process layout.

Question Number : 111 Question Id : 9003001671 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For what values of a and b the equations $x+2y+3z = 4$, $x+3y+5z = 9$, $2x+5y+az = b$ have an

infinite number of solutions

Options :

1. ✔ $a = 8, b = 15$

2. ✖ $a \neq 8, b \neq 15$

3. ✖ $a \neq 8, b = 15$

4. ✖ $a = 8, b \neq 15$

Question Number : 112 Question Id : 9003001672 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Eigen values of the matrix $\begin{bmatrix} 2 & 0 & 4 \\ 0 & 6 & 0 \\ 4 & 0 & 2 \end{bmatrix}$ are

Options :

1. ✔ -2, 6, 6

2. ✖ 2, 6, 2

3. ✖ 4, 6, 2

4. ✖ 6, 6, 0

Question Number : 113 Question Id : 9003001673 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(x, y) = x^2 + y^2 + 6x + 12$, then the stationary points are

Options :

1. ✖ (3, 0)

2. ✖ (3, 3)

3. ✖ (-3, 3)

4. ✔ (-3, 0)

Question Number : 114 Question Id : 9003001674 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Value of normal vector to the surface $\Phi = x^2yz + 4xz^2$ at the point (1, -2, -1)

Options :

1. ✖ $8i - 4j - k$

2. ✖ $i - 4j + 3k$

3. ✖ $i + 3j - 3k$

4. ✔ $8i - j - 10k$

Question Number : 115 Question Id : 9003001675 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

General Solution of $\frac{d^2y}{dx^2} - 16y = 0$

Options :

1. ✖ $y = C_1Cos4x + C_2Sin4x$

2. ✖ $y = C_1Cos4x - C_2Sin4x$

3. ✔ $y = C_1 e^{4x} + C_2 e^{-4x}$

4. ✖ $y = C_1 e^{4x} - C_2 e^{-4x}$

Question Number : 116 Question Id : 9003001676 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

General Solution of $2q(z-px-qy) = 1 + q^2$

Options :

1. ✔ $z = ax + by + (b^2+1)/2b$

2. ✖ $z = ax + by - 1/(a+b)$

3. ✖ $z = ax - by$

4. ✖ $z = ax + by - (b^2+1)/2b$

Question Number : 117 Question Id : 9003001677 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $f(z) = \frac{e^z}{(z-1)(z-2)}$, and C: $|z| = 3$. The value of $\int_c f(z)dz$ is

Options :

1. ✖ $\pi i\,(e^2 + e)$

2. ✖ $-2\pi i\,(e^2 - e)$

3. ✔ $2\pi i\,(e^2 - e)$

4. ✖ $\pi i\,(e^2 - e)$

Question Number : 118 Question Id : 9003001678 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(z) = \frac{z}{(z-1)(z-2)^2}$, then the residue at $z = 2$ is

Options :

1. ✔ -1

2. ✖ 1

3. ✖ 0

4. ✖ $2\pi i$

Question Number : 119 Question Id : 9003001679 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

There are 3 boxes I, II and III. Box I contain 4 Red, 5 Blue and 6 White balls. Box II contains 3 Red, 4 Blue and 5 White balls. Box III contains 5 Red, 10 Blue and 5 White balls. One box is chosen and one ball is drawn from it. What is the probability that Red ball is drawn?

Options :

1. ✖ 20/9

2. ✖ 23/9

3. ✖ 90/23

4. ✔ 23/90

Question Number : 120 Question Id : 9003001680 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Formula for the cube root of N, using Newton Raphson is

Options :

1. ✖ $x_{i+1} = (1/3)\left[2x_i - \frac{N}{x_i^2}\right]$

2. ✔ $x_{i+1} = (1/3)\left[2x_i + \frac{N}{x_i^2}\right]$

3. ✖ $x_{i+1} = (1/3)\left[x_i + \frac{N}{x_i^2}\right]$

4. ✖ $x_{i+1} = (1/3)\left[x_i + \frac{2N}{x_i^2}\right]$