

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 07th June 2025 Shift 2
Subject Name :	Mechanical Engineering
Creation Date :	2025-06-07 16:51:20
Duration :	120
Total Marks :	120
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No

Mechanical Engineering

Group Number :	1
Group Id :	83189661
Group Maximum Duration :	0
Group Minimum Duration :	120
Show Attended Group? :	No
Edit Attended Group? :	No

Break time : 0
Group Marks : 120

Mechanical Engineering

Section Id : 83189661
Section Number : 1
Section type : Online
Mandatory or Optional : Mandatory
Number of Questions : 120
Number of Questions to be attempted : 120
Section Marks : 120
Maximum Instruction Time : 0
Sub-Section Number : 1
Sub-Section Id : 83189661
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 8318967201 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A particle moving in a circular path with constant speed has:

Options :

1. ✘ No acceleration
2. ✔ Centripetal acceleration

3. ✘ Zero net force

4. ✘ Constant angular momentum

Question Number : 2 Question Id : 8318967202 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

For plane stress, mohr's circle has:

Options :

1. ✘ Radius equal to maximum normal stress

2. ✔ Radius equal to maximum shear stress

3. ✘ Centre at origin

4. ✘ No radius

Question Number : 3 Question Id : 8318967203 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A purchasing assistant has calculated the carrying cost in Rupees Per unit annum, and the $EOQ = 500$ units for an item. He must have taken that the annual ordering cost for this item:

Options :

1. ✓ Rs. 500
2. ✗ Rs. 100
3. ✗ Rs. 31.62
4. ✗ Rs. 22.36

Question Number : 4 Question Id : 8318967204 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Euler's theory applies to:

Options :

1. ✗ Long columns with lateral loads

2. ✘ Short columns
3. ✔ Long, slender columns under axial compression
4. ✘ Beams under bending

Question Number : 5 Question Id : 8318967205 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Critical damping is a function of

Options :

1. ✔ Mass and stiffness
2. ✘ Mass and damping co-efficient
3. ✘ Stiffness and natural frequency

Natural frequency and damping co-efficient

4. ✘

Question Number : 6 Question Id : 8318967206 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In a simple gear train, the velocity ratio depends on:

Options :

1. ✘ Shaft distance

2. ✔ Number of teeth on gears

3. ✘ Module

4. ✘ Pressure angle

Question Number : 7 Question Id : 8318967207 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A stone of mass 'm' at the end of a string of length 'l' is whirled in a vertical position at a constant speed. The tension in the string will be minimum when the stone is at the

Options :

1. ✘ Bottom of the circle
2. ✘ Half-down from the top
3. ✘ Quarter way down from the top
4. ✔ Top of the circle

Question Number : 8 Question Id : 8318967208 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Critical speed of shaft corresponds to:

Options :

1. ✘ Zero angular velocity

2. ✓ Natural frequency of lateral vibration
3. ✘ Highest rpm
4. ✘ No damping

Question Number : 9 Question Id : 8318967209 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Whirling speed of a shaft coincide with the natural frequency of the:

Options :

1. ✘ Longitudinal vibration
2. ✓ Transverse vibration
3. ✘ Torsional vibration
4. ✘ Coupled between torsional vibration

Question Number : 10 Question Id : 8318967210 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The range of projectile is maximum when the angle of projection is:

Options :

1. ✓ 45°
2. ✗ 30°
3. ✗ 60°
4. ✗ 90°

Question Number : 11 Question Id : 8318967211 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Pressure in a static fluid:

Options :

1. ✗ Varies with horizontal distance

2. ✓ Varies with depth

3. ✘ Is constant

4. ✘ Is maximum at the surface

Question Number : 12 Question Id : 8318967212 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

What is the nature of distribution of shear stress in a rectangular beam?

Options :

1. ✘ Linear

2. ✓ Parabolic

3. ✘ Hyperbolic

4. ✘ Elliptical

Question Number : 13 Question Id : 8318967213 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In laminar pipe flow, head loss varies with:

Options :

1. ✘ Velocity

2. ✔ Velocity squared

3. ✘ Pressure

4. ✘ Temperature

Question Number : 14 Question Id : 8318967214 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In gears, interference takes place when:

Options :

Tip of a tooth of a mating gear digs into the portion between base and root circles

1. ✓

Gears do not move smoothly in the absence of lubrication

2. ✘

Pitch of the gear is not same

3. ✘

Gear teeth are undercut

4. ✘

Question Number : 15 Question Id : 8318967215 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In hot working:

Options :

Annealing operation is not necessary

1. ✘

Power requirements are low

2. ✘

3. ✘ Surface finish is good
4. ✔ Grain refinement is possible

Question Number : 16 Question Id : 8318967216 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Nusselt number is the ratio of:

Options :

1. ✘ Inertial to viscous forces
2. ✔ Convective to conductive heat transfer
3. ✘ Convective to radiative heat transfer
4. ✘ Viscous to inertial forces

Question Number : 17 Question Id : 8318967217 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Rankine's theory of failure is applicable for which of the following type of materials?

Options :

1. ✓ Brittle
2. ✗ Ductile
3. ✗ Elastic
4. ✗ Plastic

Question Number : 18 Question Id : 8318967218 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The elastic region in a stress-strain diagram corresponds to:

Options :

1. ✗ Plastic deformation

2. ✓ Reversible deformation
3. ✘ Necking
4. ✘ Fracture



Question Number : 19 Question Id : 8318967219 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Is specifies which of the following total number of grades of tolerances?

Options :

1. ✓ 18
2. ✗ 16
3. ✗ 20
4. ✗ 22

Question Number : 20 Question Id : 8318967220 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Second law introduces the concept of:

Options :

1. ✗ Heat

2. ✘ Energy

3. ✔ Entropy

4. ✘ Volume

Question Number : 21 Question Id : 8318967221 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

From a metallic wall at 100°C , a metallic rod protrudes to the ambient air. The temperature at the tip will be minimum when the rod is made of:

Options :

1. ✘ Aluminium

2. ✔ Steel

3. ✘ Copper

Silver

4. ✘

Question Number : 22 Question Id : 8318967222 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The elastic constants, modulus of rigidity ' K ' and modulus of elasticity ' E ' are related through poisson's ratio ' μ ' as:

Options :

1. ✔ $\frac{E}{3(1-2\mu)}$

2. ✘ $E(1-2\mu)$

3. ✘ $3E(1-2\mu)$

4. ✘ $\frac{E}{3}(1+2\mu)$

Question Number : 23 Question Id : 8318967223 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Availability is:

Options :

1. ✘ Work lost due to friction
2. ✔ maximum useful work
3. ✘ heat available from system
4. ✘ energy in environment

Question Number : 24 Question Id : 8318967224 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If two bodies one light and other heavy have equal kinetic energies,
which one has a greater momentum?

Options :

1. ✘ Heavy body

2. ✓ Light body
3. ✘ Both have equal momentum
4. ✘ It depends on the actual velocities.

Question Number : 25 Question Id : 8318967225 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which dimensionless number represents the ratio of inertial to viscous forces in forced convection?

Options :

1. ✘ Nusselt number
2. ✓ Reynolds number
3. ✘ Grashof number

Rayleigh number

4. ✘

Question Number : 26 Question Id : 8318967226 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A flexible manufacturing system may be:

Options :

1. ✔ An automated assembly line

2. ✘ Expensive to alter

3. ✘ Very difficult to change when new products are introduced

4. ✘ Flexibility in design of product

Question Number : 27 Question Id : 8318967227 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Control volume refers to a:

Options :

1. ✘ Specified mass
2. ✔ Fixed region in the space
3. ✘ Closed system
4. ✘ Specific Volume

Question Number : 28 Question Id : 8318967228 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Rankine cycle is used in:

Options :

1. ✘ Gas turbines

2. ✓ Steam power plants

3. ✘ Refrigerators

4. ✘ Automobiles

Question Number : 29 Question Id : 8318967229 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Highest thermal conductivity is of

Options :

1. ✓ Solid ice

2. ✘ Melting ice

3. ✘ Water

4. ✘ Steam

Question Number : 30 Question Id : 8318967230 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The ratio of applied load to instantaneous cross section area is called

Options :

1. ✘ Engineering stress

2. ✔ True stress

3. ✘ Engineering strain

4. ✘ True strain

Question Number : 31 Question Id : 8318967231 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Brayton cycle is used in:

Options :

1. ✘ Steam engines

2. ✘ Diesel engines

3. ✔ Gas turbines

4. ✘ Heat pumps

Question Number : 32 Question Id : 8318967232 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The condition for maximum power transmission by an open belt drive considering centrifugal tension is:
($T = \text{max. Tension}$, $T_c = \text{centrifugal tension}$)

Options :

1. ✘ $T = 2T_c$

2. ✘ $T = 4T_c$

3. ✔ $T = 3T_c$

4. ✘ $T=3T^2_c$

Question Number : 33 Question Id : 8318967233 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Investment casting uses pattern made of:

Options :

1. ✔ Wax

2. ✘ Clay

3. ✘ Metal

4. ✘ Wood

Question Number : 34 Question Id : 8318967234 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which property of mercury is the main reason for its use in barometers?

Options :

1. ✘ High density
2. ✘ Capillary effect is negligible
3. ✔ Very low vapour pressure
4. ✘ Low compressibility

Question Number : 35 Question Id : 8318967235 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Compression ratio of diesel cycle is:

Options :

1. ✘ Lower than Otto
2. ✘ Equal to Otto

3. ✓ Higher than Otto

4. ✗ Depends on fuel

Question Number : 36 Question Id : 8318967236 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Kelvin-plank's law deals with:

Options :

1. ✗ Conversion of work into heat

2. ✓ Conversion of heat into work

3. ✗ Conservation of work

4. ✗ Conservation of heat

Question Number : 37 Question Id : 8318967237 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following is an open pair?

Options :

1. ✘ Ball and socket joint
2. ✘ Journal bearing
3. ✘ Lead screw and nut
4. ✔ Cam and follower

Question Number : 38 Question Id : 8318967238 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Shaft is subjected to which of the following stresses?

Options :

1. ✘ Bending

2. ✘ Torsional
3. ✔ Both Bending and Torsional
4. ✘ Tensile

Question Number : 39 Question Id : 8318967239 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Humidification increases:

Options :

1. ✘ Dry bulb temp
2. ✔ Moisture content of air
3. ✘ Air velocity

Pressure

4. ✘

Question Number : 40 Question Id : 8318967240 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The elastic strain energy stored in a rectangular cantilever beam of length L, subjected to a B.M., M applied at the end of it is:

Options :

1. ✔ $M^2L / 2 EI$

2. ✘ $ML^2/2AE$

3. ✘ $ML^2/3EI$

4. ✘ $ML^2/16 EI$

Question Number : 41 Question Id : 8318967241 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A process in which no heat is transferred is called:

Options :

1. ✘ Isobaric
2. ✔ Adiabatic
3. ✘ Isothermal
4. ✘ Isochoric

Question Number : 42 Question Id : 8318967242 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The main component in soldering is:

Options :

1. ✘ Copper
2. ✔ Tin-lead alloy
3. ✘ Aluminium

Nickel

4. ✘

Question Number : 43 Question Id : 8318967243 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A refrigerator unit weighing 300 N is to be supported by three springs of stiffness of 10.26 kN/mm each. If the unit operates at 580 r.p.m., what should be the value of the spring constant k if only 10% of the shaking force of the unit is to be transmitted to the supporting structure?

Options :

1. ✘ 2.4 N/mm

2. ✘ 3.0 N/mm

3. ✔ 3.4 N/mm

4. ✘ 4 N/mm

Question Number : 44 Question Id : 8318967244 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The required diameter of the blank for the deep drawing of a cup of diameter 'd' and height 'h' is given by:

Options :

1. ✘ $\sqrt{d^2 - 2dh}$

2. ✘ $\sqrt{d^2 + 2dh}$

3. ✘ $\sqrt{d^2 - 4dh}$

4. ✔ $\sqrt{d^2 + 4dh}$

Question Number : 45 Question Id : 8318967245 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the ratio of the diameter of rivet hole to the pitch of rivets is 0.30, then the tearing efficiency of the joint is:

Options :

1. ✓ 70%
2. ✘ 60%
3. ✘ 50%
4. ✘ 30%

Question Number : 46 Question Id : 8318967246 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In thin cylindrical pressure vessels, hoop stress is:

Options :

1. ✘ Equal to axial stress
2. ✘ Half of axial stress
3. ✓ Twice the axial stress

One-fourth axial stress

4. ✘

Question Number : 47 Question Id : 8318967247 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Cores are used to:

Options :

1. ✔ Make desired recess in castings

2. ✘ Strengthen moulding sand

3. ✘ Support loose pieces

4. ✘ Remove pattern easily

Question Number : 48 Question Id : 8318967248 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Austempering is the heat treatment process used to obtain:

Options :

1. ✘ Low hardness
2. ✘ High toughness
3. ✔ High hardness
4. ✘ High ductility

Question Number : 49 Question Id : 8318967249 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Natural frequency of undamped SDOF system is:

Options :

1. ✘ $\sqrt{(m/k)}$
2. ✔ $\sqrt{(k/m)}$
3. ✘ k/m

4. ✘ m/k

Question Number : 50 Question Id : 8318967250 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following casting process used an expendable pattern?

Options :

1. ✘ CO₂ casting

2. ✘ Die casting

3. ✘ Centrifugal casting

4. ✔ Investment casting

Question Number : 51 Question Id : 8318967251 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In drawing operation, the metal flows due to:

Options :

1. ✘ Ductility
2. ✘ Work hardening
3. ✔ Plasticity
4. ✘ Shearing

Question Number : 52 Question Id : 8318967252 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The rake angle is a property of:

Options :

1. ✘ Tool wear
2. ✔ Tool geometry
3. ✘ Workpiece shape

4. ✘ Cutting fluid

Question Number : 53 Question Id : 8318967253 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A Mohr's circle reduces to a point when the body is subjected to:

Options :

1. ✘ Pure shear

2. ✘ Uniaxial stress only

3. ✘ Equal and opposite axial stresses on two mutually perpendicular planes, the planes being free of shear

4. ✔ Equal axial stresses on two mutually perpendicular planes, the planes being free of shear.

Question Number : 54 Question Id : 8318967254 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In a throttling process, which one of the parameters remains constant?

Options :

1. ✘ Temperature
2. ✘ Pressure
3. ✔ Enthalpy
4. ✘ Entropy

Question Number : 55 Question Id : 8318967255 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Resonance occurs when:

Options :

1. ✘ Damping is high

2. ✘ Mass equals stiffness
3. ✔ Forcing frequency equals natural frequency
4. ✘ Displacement is zero

Question Number : 56 Question Id : 8318967256 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Brazing differs from soldering primarily in the following

Options :

1. ✘ Type of base metal used
2. ✔ Temperature of the filler metal
3. ✘ Use of electricity

Type of shielding gas used

4. ✘

Question Number : 57 Question Id : 8318967257 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The addition of coal dust to the green moulding sand is to improve:

Options :

1. ✘ Permeability

2. ✔ Surface finish

3. ✘ Mouldability

4. ✘ Green strength

Question Number : 58 Question Id : 8318967258 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Seam welding used for metal sheets having thickness in the range:

Options :

1. ✓ 0.025 to 3 mm
2. ✘ 3 to 6 mm
3. ✘ 6 to 10 mm
4. ✘ More than 10 m

Question Number : 59 Question Id : 8318967259 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is a Taylor's tool life equation, where
V-cutting speed (m/min), T-tool life (min), n-exponent and C-
constant?

Options :

1. ✘ $TV^n = C$

2. ✓ $VT^n = C$

3. ✗ $VC^n = T$

4. ✗ $CV^n = T$

Question Number : 60 Question Id : 8318967260 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

CAD/CAM is hardware oriented, but gives it life.

Options :

1. ✗ Numerical control

2. ✗ Documentation

3. ✓ Software

Communications

4. ✘

Question Number : 61 Question Id : 8318967261 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

EDM (Electric Discharge Machining) is suitable for:

Options :

1. ✘ Plastic parts

2. ✔ Hard conductive materials

3. ✘ Wooden molds

4. ✘ Composites

Question Number : 62 Question Id : 8318967262 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The continuity equation $\frac{du}{dx} + \frac{dv}{dy} + \frac{dw}{dz} = 0$ is valid only for:

Options :

1. ✘ Ideal fluid flow
2. ✘ Incompressible fluid
3. ✘ Steady flow and incompressible fluids
4. ✔ Steady flow and compressible fluids

Question Number : 63 Question Id : 8318967263 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In a planar truss, the number of members (m), joints (j), and reactions (r) are related by:

Options :

$$m + r = 2j$$

1. ✘

2. ✘ $m + j = 2r$

3. ✔ $m + r = j$

4. ✘ $m + j = r$

Question Number : 64 Question Id : 8318967264 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Quick return mechanism is an inversion of:

Options :

1. ✘ Four bar chain

2. ✔ Single slider crank chain

3. ✘ Double slider crank chain

Crossed slider crank chain

4. ✘

Question Number : 65 Question Id : 8318967265 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In wire drawing operation, the maximum reduction per pass for perfectly plastic material in ideal condition is:

Options :

1. ✘ 30 %

2. ✘ 45 %

3. ✔ 63 %

4. ✘ 50 %

Question Number : 66 Question Id : 8318967266 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In metal cutting operations, discontinuous chips are produced while machining:

Options :

1. ✓ Brittle material
2. ✘ Ductile material
3. ✘ Hard material
4. ✘ Soft material

Question Number : 67 Question Id : 8318967267 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Least count of a micrometer screw gauge is usually:

Options :

1. ✘ 0.1 mm

2. ✓ 0.01 mm

3. ✗ 0.001 mm

4. ✗ 1 mm

Question Number : 68 Question Id : 8318967268 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In an open system, both _____ and _____ can cross the boundary?

Options :

1. ✗ Heat and mass

2. ✗ Work and energy

3. ✓ Mass and energy

Pressure and volume

4. ✘

Question Number : 69 Question Id : 8318967269 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Reheating in Brayton cycle:

Options :

1. ✘ Decreases work output

2. ✘ Reduces temperature

3. ✔ Increases work output

4. ✘ Reduces efficiency

Question Number : 70 Question Id : 8318967270 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Strength of a material is its ability to resist:

Options :

1. ✘ Deformation due to stress
2. ✘ Fracture due to high load
3. ✔ External forces applied with yielding or break down
4. ✘ The flow

Question Number : 71 Question Id : 8318967271 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

As the distance from the leading edge increases, the thermal boundary layer thickness:

Options :

1. ✔ Increases
2. ✘ Remains constant

3. ✘ Decreases

4. ✘ Becomes zero

Question Number : 72 Question Id : 8318967272 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Provision of fins on a given heat transfer surface will be more, if there are:

Options :

1. ✘ Fewer number of thick fins

2. ✘ Fewer number of thin fins

3. ✔ Large number of thin fins

4. ✘ Large number of thick fins

Question Number : 73 Question Id : 8318967273 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The primary mechanism of material removal in electrochemical machining (ECM) is:

Options :

1. ✘ Chemical corrosion
2. ✔ Ionic dissolution
3. ✘ Etching
4. ✘ Spark erosion

Question Number : 74 Question Id : 8318967274 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the S-N curve, “N” represents :

Options :

1. ✘ Load cycles

2. ✓ Number of cycles to failure

3. ✘ Stress amplitude

4. ✘ Time to failure

Question Number : 75 Question Id : 8318967275 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The value of poisson's ratio for any material cannot exceed:

Options :

1. ✘ 0.2

2. ✘ 1.0

3. ✘ 1.414

0.5

4. ✓

Question Number : 76 Question Id : 8318967276 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Amount of external energy required to deform an elastic body is called:

Options :

Elastic energy

1. ✘

Plastic energy

2. ✘

Strain energy

3. ✓

Thermal energy

4. ✘

Question Number : 77 Question Id : 8318967277 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Balancing of a rigid rotor can be achieved by appropriately balancing masses in:

Options :

1. ✘ Single plane
2. ✔ Two planes
3. ✘ Three planes
4. ✘ Four planes

Question Number : 78 Question Id : 8318967278 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Forecasting in PPC helps in:

Options :

1. ✘ Inventory disposal

2. ✘ Machine maintenance
3. ✔ Planning future production needs
4. ✘ Waste disposal

Question Number : 79 Question Id : 8318967279 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Heat transfer takes place according to:

Options :

1. ✘ Zeroth law of thermodynamics
2. ✘ First law of thermodynamics
3. ✔ Second law of thermodynamics

Third law of thermodynamics

4. ✘

Question Number : 80 Question Id : 8318967280 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The locus of elevations that water will rise in a series of pitot tubes is called:

Options :

The hydraulic grade line

1. ✘

The energy grade line

2. ✘

The velocity head

3. ✔

The pressure head

4. ✘

Question Number : 81 Question Id : 8318967281 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which material is commonly used for pattern making?

Options :

1. ✘ Cast iron
2. ✔ Wood
3. ✘ Bronze
4. ✘ Lead

Question Number : 82 Question Id : 8318967282 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The instantaneous centre of rotation of a rigid thin disc rolling on a plane rigid surface is located at:

Options :

1. ✘ Centre of the disc

An infinite distance on the plane surface

2. ✘

The point of contact

3. ✔

The point on the circumference situated vertically opposite to the contact point

4. ✘

Question Number : 83 Question Id : 8318967283 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The gears employed for connecting two non-intersecting and non-parallel, i.e., non-coplanar shafts are:

Options :

1. ✘ Bevel gears

2. ✔ Spiral gears

3. ✘ Helical gears

4. ✘ Mitre gears

Question Number : 84 Question Id : 8318967284 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the machining process uses the principle of faraday's law for material removal?

Options :

1. ✘ EDM

2. ✘ LBM

3. ✔ ECM

4. ✘ EBM

Question Number : 85 Question Id : 8318967285 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A master gauge is a an:

Options :

1. ✘ New gauge
2. ✘ International reference standard
3. ✔ Standard gauge for checking accuracy of gauges used on shop floors
4. ✘ Gauge used by experienced technicians

Question Number : 86 Question Id : 8318967286 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Gating system in casting controls:

Options :

1. ✘ Cooling rate only
2. ✔ Flow of molten metal

3. ✘ Pouring time

4. ✘ Mold expansion

Question Number : 87 Question Id : 8318967287 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

For the two shafts connected in parallel, find which statement is true?

Options :

1. ✘ Torque in each shaft is the same

2. ✘ Shear stress in each shaft is the same

3. ✔ Angle of twist of each shaft is the same

4. ✘ Torsional stiffness of each shaft is the same.

Question Number : 88 Question Id : 8318967288 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following metals shows a clear yield point?

Options :

1. ✘ Copper
2. ✘ Aluminium
3. ✔ Mild steel
4. ✘ Titanium

Question Number : 89 Question Id : 8318967289 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Cold working process can be applied on the components having diameter up to:

Options :

1. ✘ 12 mm

2. ✓ 25 mm

3. ✘ 49 mm

4. ✘ 50 mm

Question Number : 90 Question Id : 8318967290 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Thermal stress occurs when:

Options :

1. ✘ Temperature is uniform

2. ✘ Expansion is allowed

3. ✓ Expansion is restrained

There is no temperature change

4. ✘

Question Number : 91 Question Id : 8318967291 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In a vapour compression refrigeration cycle, the refrigerant absorbs heat in the following.

Options :

1. ✘ Condenser

2. ✘ Compressor

3. ✘ Expansion valve

4. ✔ Evaporator

Question Number : 92 Question Id : 8318967292 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Group technology brings together and organizes:

Options :

1. ✘ Parts and simulation analysis
2. ✘ Documentation and analysis
3. ✘ Automation and tool production
4. ✔ Common parts, problems, and tasks

Question Number : 93 Question Id : 8318967293 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Forging is typically done:

Options :

1. ✔ At room temperature
2. ✘ At elevated temperatures
3. ✘ In powder form

For non-metallic parts

4. ✘

Question Number : 94 Question Id : 8318967294 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

With rise in gas temperature, dynamic viscosity of most of the gases:

Options :

1. ✔ Increases

2. ✘ Decreases

3. ✘ Does not change significantly.

4. ✘ Remains constant

Question Number : 95 Question Id : 8318967295 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Conduction requires:

Options :

1. ✓ Temperature gradient
2. ✘ Fluid motion
3. ✘ Radiation
4. ✘ Vacuum

Question Number : 96 Question Id : 8318967296 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A system of masses rotating in different parallel planes is in dynamic balance if the resultant:

Options :

1. ✘ Force is equal to zero
2. ✘ Couple is equal to zero

3. ✓ Force and the resultant couple are both equal to zero

4. ✗ Force is numerically equal to the resultant couple, but neither of them need necessarily be zero.

Question Number : 97 Question Id : 8318967297 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Ability of a material to retain the deformation permanently is called:

Options :

1. ✗ Stiffness

2. ✗ Ductility

3. ✗ Hardness

4. ✓ Plasticity

Question Number : 98 Question Id : 8318967298 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The creep in belt drive is due to the:

Options :

1. ✘ Material of the pulleys
2. ✘ Material of the belt
3. ✘ Unequal size of the pulleys
4. ✔ Unequal tension on tight side and slack sides of the belt

Question Number : 99 Question Id : 8318967299 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Spur gears have:

Options :

1. ✘ Helical teeth
2. ✔ Straight teeth

3. ✘ Bevel teeth

4. ✘ Spiral teeth

Question Number : 100 Question Id : 8318967300 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A flow in which each liquid particle has a definite path and their paths do not cross each other, is called:

Options :

1. ✘ Steady flow

2. ✘ Uniform flow

3. ✔ Streamline flow

4. ✘ Turbulent flow

Question Number : 101 Question Id : 8318967301 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Heat conduction through a wall follows:

Options :

1. ✓ Fourier's law
2. ✘ Newton's law
3. ✘ Stefan-Boltzmann law
4. ✘ Kirchhoff's law

Question Number : 102 Question Id : 8318967302 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the efficiency of a belt drive is more than 50%, then it is called:

Options :

1. ✘ Self-locking

2. ✘ Over loading

3. ✔ Over-hauling

4. ✘ Over efficiency drive

Question Number : 103 Question Id : 8318967303 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Discontinuous chips are formed during machining of:

Options :

1. ✔ Cast iron

2. ✘ Mild steel

3. ✘ Aluminium

4. ✘ Stainless steel

Question Number : 104 Question Id : 8318967304 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Limits and fits ensure:

Options :

1. ✘ Aesthetic appeal
2. ✔ Proper function and interchangeability
3. ✘ Heat transfer
4. ✘ Colour coding

Question Number : 105 Question Id : 8318967305 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

For maximum horizontal range, the angle of projection of a projectile should be:

Options :

1. ✘ 30°
2. ✔ 45°
3. ✘ 60°
4. ✘ 90°

Question Number : 106 Question Id : 8318967306 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Francis, Kaplan and propeller turbines fall under the category of:

Options :

1. ✔ Reaction turbines
2. ✘ Impulse turbines

Axial flow turbines

3. ✘

Mixed flow turbines

4. ✘

Question Number : 107 Question Id : 8318967307 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Bernoulli's equation is applicable to:

Options :

Compressible viscous flows

1. ✘

All types of flow

2. ✘

Incompressible and inviscid flow

3. ✔

Steady turbulent flows

4. ✘

Question Number : 108 Question Id : 8318967308 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The area enclosed by a thermodynamic cycle on a p-v diagram represents:

Options :

1. ✘ Heat rejected
2. ✔ Net work done
3. ✘ Energy loss
4. ✘ Efficiency

Question Number : 109 Question Id : 8318967309 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In electrical resistance welding, pressure applied varies in the range:

Options :

1. ✘ 50 to 100 kgf/cm²

2. ✘ 100 to 200 kgf/cm²
3. ✔ 250 to 550 kgf/cm²
4. ✘ 600 to 900 kgf/cm²

Question Number : 110 Question Id : 8318967310 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Compared to the Otto cycle for the same compression ratio, the diesel cycle efficiency is:

Options :

1. ✔ Lower
2. ✘ Higher
3. ✘ Equal

Cannot be determined

4. ✖

Question Number : 111 Question Id : 8318967311 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Determine the value of λ and μ for which such that the system of equations $x + 2y + z = 6$, $x + 4y + 3z = 10$, and

$2x + 4y + \lambda z = \mu$ has infinite number of solutions

Options :

1. ✖ $\lambda = 2, \mu \neq 12$

2. ✖ $\lambda = 2, \mu = 12$

3. ✔ $\lambda \neq 2, \mu \neq 12$

4. ✖ for any λ and any μ

Question Number : 112 Question Id : 8318967312 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the matrix $A = \begin{pmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{pmatrix}$ has three distinct eigenvalues and one of its eigenvectors is $\begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$, then which of the following can be another eigenvector of A ?

Options :

1. ✘ $\begin{pmatrix} -1 \\ 0 \\ 1 \end{pmatrix}$

2. ✘ $\begin{pmatrix} -1 \\ 0 \\ 2 \end{pmatrix}$

3. ✘ $\begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix}$

4. ✓ $\begin{pmatrix} 1 \\ -2 \\ 1 \end{pmatrix}$

Question Number : 113 Question Id : 8318967313 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If $\vec{F} = x(x^2 + y^2 + z^2)\hat{i} + 2y(x^2 + y^2 + z^2)\hat{j} + 3z(x^2 + y^2 + z^2)\hat{k}$, then $\text{div}\vec{F}$ at $(1,1,1)$ is equal to _____

Options :

- 1. ✘ 12
- 2. ✘ 21
- 3. ✓ 30
- 4. ✘ 33

Question Number : 114 Question Id : 8318967314 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The value of the line integral $\int_C (2xy^2 dx + 2x^2 y dy - \frac{1}{3} z dz)$ along a path joining the origin $(0,0,0)$ and the point $(1,1,1)$ is _____

Options :

1. ✘ $\frac{1}{2}$
2. ✘ $\frac{7}{6}$
3. ✘ $\frac{3}{2}$
4. ✔ $\frac{5}{6}$

Question Number : 115 Question Id : 8318967315 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $y(x)$ satisfies the differential equation $x \frac{dy}{dx} + (x - y) = 0$ subject to the condition $y(1) = 0$, then $y(e)$ is _____

Options :

1. ✓ $-e$

2. ✗ $-2e$

3. ✗ e

4. ✗ $2e$

Question Number : 116 Question Id : 8318967316 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If the Laplace transform of a function $f(t)$ is given by $\frac{2s+1}{(s+1)(s+2)}$, then
 $f(0)$ is equal to _____

Options :

1. ✓ 2

2. ✗ 4

3. ✘ -4

4. ✘ $3e - 1$

Question Number : 117 Question Id : 8318967317 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Let A, B be two events and \bar{A} be the complement of A . If

$P(\bar{A}) = 0.7, P(B) = 0.7$ and $P(B|A) = 0.5$, then $P(A \cup B) =$

Options :

1. ✘ 0.65

2. ✔ 0.85

3. ✘ 0.75

4. ✘ 0.50

Question Number : 118 Question Id : 8318967318 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

A machine produces 0, 1 or 2 defective items in a day with probabilities of $\frac{1}{4}, \frac{1}{2}, \frac{1}{4}$, respectively. Then, the standard deviation of the number of defective items produced by the machine in a day, is

Options :

1. ✘ $\frac{1}{2}$

2. ✔ $\frac{1}{\sqrt{2}}$

3. ✘ $\frac{1}{4}$

4. ✘ 1

Question Number : 119 Question Id : 8318967319 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Evaluation of the integral $\int_2^4 x^2 dx$ using the trapezoidal rule (with two equal segments) gives a value of _____

Options :

1. ✘ 14.5
2. ✘ 22.5
3. ✔ 19.0
4. ✘ 18.6

Question Number : 120 Question Id : 8318967320 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Let $f(x) = x^3 + 2x^2 + 3x - 1$. Newton-Raphson method is used to find the root of the equation $f(x) = 0$. If the initial guess is $x_0 = 1$, then the value of x after first iteration is _____

Options :

1. ✘ 0.30

- 2. ✖ 0.36
- 3. ✖ 0.40
- 4. ✔ 0.50

