



Telangana State Council 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 24th Sept 2020 Shift 1
Subject Name :	Mechanical Engineering
Creation Date :	2020-09-24 15:58:28
Duration :	120
Total Marks :	120
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Actual Answer Key :	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

Mechanical Engineering

Group Number :	1
Group Id :	88039695
Group Maximum Duration :	0
Group Minimum Duration :	120
Show Attended Group? :	No

Edit Attended Group? :	No
Break time :	0
Group Marks :	120
Is this Group for Examiner? :	No

Mathematics

Section Id :	880396173
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	10
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	880396173
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 88039611281 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Residue of $f(z) = \frac{1}{(z^2 + 3z + 2)^3}$ at $z = -2$ is

Options :

88039645121. ✘ - 3

88039645122. ✘ - 4

88039645123. ✘ - 5

88039645124. ✔ - 6

Question Number : 2 Question Id : 88039611282 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Residue of $z \tan (iz)$ at $z = \frac{i\pi}{2}$ is

Options :

88039645125. ✘ π

88039645126. ✘ $-\pi$

88039645127. ✔ $\frac{-\pi}{2}$

88039645128. ✘ $\frac{\pi}{2}$

Question Number : 3 Question Id : 88039611283 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Laplace transform of $f(t) = t^2 \sin 2t$ is

Options :

88039645129. ✔ $\frac{4(3s^2 - 4)}{(s^2 + 4)^3}$

88039645130. ✘ $\frac{4(3s^2 + 4)}{(s^2 + 4)^3}$

88039645131. ✘ $\frac{4(3s^2 - 4)}{(s^2 - 4)^3}$

88039645132. ✘ $\frac{4(3s^2 - 2)}{(s^2 + 4)^3}$

Question Number : 4 Question Id : 88039611284 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Particular integral of $xy'' + 2y' = x$ is

Options :

88039645133. ✘ $\frac{x^2}{12}$

88039645134. ✔ $\frac{x^2}{6}$

88039645135. ✘ $\frac{x^2}{3}$

88039645136. ✘ $\frac{x^2}{2}$

Question Number : 5 Question Id : 88039611285 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Surface area (in sq. units) of the solid of revolution of $f(x) = \sqrt{1-x^2}$, $x = -1$ to around the x - axis is

Options :

88039645137. ✘ 2π

88039645138. ✘ 3π

88039645139. ✔ 4π

88039645140. ✘ 5π

Question Number : 6 Question Id : 88039611286 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If characteristic equation of a 3×3 matrix A is $\lambda^3 - \lambda^2 - \lambda + 1 = 0$, then the determinant of A is

Options :

88039645141. ✘ 0

88039645142. ✘ 1

88039645143. ✔ -1

88039645144. ✘ 2

Question Number : 7 Question Id : 88039611287 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let S be the set of all critical points of $f(x) = x^5$. A point (x_0, y_0) is chosen at random from S. Then the probability that f has an extremum at (x_0, y_0) is

Options :

88039645145. ✓ 0

88039645146. ✗ $\frac{1}{2}$

88039645147. ✗ $\frac{2}{3}$

88039645148. ✗ $\frac{3}{4}$

Question Number : 8 Question Id : 88039611288 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The number of solutions of the system of equations $x - 4y - 5z = 16$, $x - 2y + z = 5$, $y - 3z = 6$ is

Options :

88039645149. ✗ infinite

88039645150. ✗ 2

88039645151. ✗ 1

88039645152. ✓ 0

Question Number : 9 Question Id : 88039611289 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If X is a binomial variate with parameters n, p and has mean and variance respectively 15 and 10, then p =

Options :

88039645153. ✘ $\frac{1}{4}$

88039645154. ✔ $\frac{2}{5}$

88039645155. ✘ $\frac{1}{5}$

88039645156. ✘ $\frac{1}{2}$

Question Number : 10 Question Id : 88039611290 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The number of real roots of the equation $x^7 - 10x^5 + 15x + 5 = 0$ is

Options :

88039645157. ✘ 3

88039645158. ✘ 4

88039645159. ✔ 5

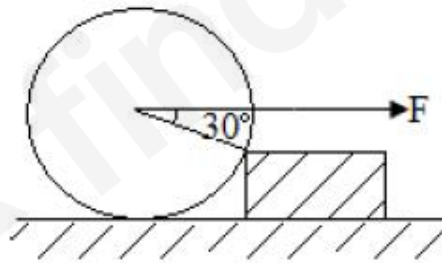
88039645160. ✘ 6

Mechanical Engineering

Section Id :	880396174
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	110
Number of Questions to be attempted :	110
Section Marks :	110
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	880396174
Question Shuffling Allowed :	Yes

Question Number : 11 Question Id : 88039611291 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A roller of weight W is rolled over the concrete block shown in figure below. The pull F required to just cause the said motion is



Options :

88039645161. ✘ $W/2$

88039645162. ✘ W

88039645163. ✓ $\sqrt{3}W$

88039645164. ✗ $W/\sqrt{3}$

Question Number : 12 Question Id : 88039611292 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A circular solid disc of thickness 12 mm acting as a flywheel having a radius of 200 mm and mass of 25 kg rotates at 300 rpm. The kinetic energy of the flywheel in J is

Options :

88039645165. ✓ $25 \pi^2$

88039645166. ✗ $50 \pi^2$

88039645167. ✗ $64 \pi^2$

88039645168. ✗ $68 \pi^2$

Question Number : 13 Question Id : 88039611293 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which of the following statements is true for inelastic collision of two particles

Options :

88039645169. ✓ Total linear momentum is conserved

88039645170. ✖ Total kinetic energy is conserved

88039645171. ✖ Both linear momentum and kinetic energy are conserved

88039645172. ✖ Neither linear momentum nor kinetic energy are conserved

Question Number : 14 Question Id : 88039611294 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A steel ball dropped from a height of h_1 on to a steel plate and rebounds to a height of h_2 .

The coefficient of restitution between the ball and plate will be

Options :

88039645173. ✖ $\frac{h_1}{h_2}$

88039645174. ✖ $\frac{h_1}{2h_2}$

88039645175. ✔ $\sqrt{\frac{h_2}{h_1}}$

88039645176. ✖ $\sqrt{2h_1}$

Question Number : 15 Question Id : 88039611295 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Strain energy 'U' stored in a body, when load is gradually applied, is equal to (where 'σ' is stress developed in the body, 'E' modulus of elasticity of the material and 'V' is the volume of the body)

Options :

88039645177. ✓ $\frac{\sigma^2 V}{2 E}$

88039645178. ✗ $\frac{\sigma^2 V}{E}$

88039645179. ✗ $\frac{\sigma^2 E}{2 V}$

88039645180. ✗ $\frac{\sigma^2 E}{V}$

Question Number : 16 Question Id : 88039611296 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Compared to normal material, a tougher material has

Options :

88039645181. ✗ High stress and large deformation

88039645182. ✗ Low stress and large deformation

88039645183. ✓ High stress and low deformation

88039645184. ✘ Low stress and low deformation

Question Number : 17 Question Id : 88039611297 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A steel rod 5 m long and 40 mm diameter is used as a column with one end fixed and other end free. Crippling load by Euler's formula will be (Take $E=200$ GPa)

Options :

88039645185. ✔ $80 \pi^3$ N

88039645186. ✘ $60 \pi^3$ N

88039645187. ✘ $40 \pi^3$ N

88039645188. ✘ $20 \pi^3$ N

Question Number : 18 Question Id : 88039611298 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Aluminium alloy bar fixed at its both ends is heated through 20 K. Taking E as 80 GPa and coefficient of linear expansion as $24 \times 10^{-6}/K$, the stress developed in the bar is

Options :

88039645189. ✘ 24.6 MPa

88039645190. ✘ 32.4 MPa

88039645191. ✘ 35.7 MPa

88039645192. ✔ 38.4 MPa

Question Number : 19 Question Id : 88039611299 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the equivalent spring stiffness and natural frequency of the system having mass of 10 kg fixed between two springs with stiffness of $K_1 = 5 \text{ N/mm}$ and $K_2 = 8 \text{ N/mm}$

Options :

88039645193. ✘ 13 N/mm and 3.57 Hz

88039645194. ✔ 13 N/mm and 0.181 Hz

88039645195. ✘ 40.13 N/mm and 2.35 Hz

88039645196. ✘ 40.13 N/mm and 2.79 Hz

Question Number : 20 Question Id : 88039611300 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An Isochronous governor has the range of speed

Options :

88039645197. ✘ Same as mean speed

88039645198. ✘ Greater than mean speed

88039645199. ✔ Equal to zero

88039645200. ✘ Equal to infinity

Question Number : 21 Question Id : 88039611301 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

For a circular shaft transmitting power, Torque to Weight ratio is directly proportional to its

Options :

88039645201. ✔ Diameter

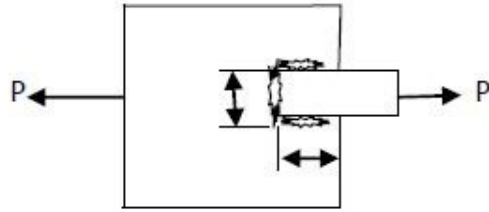
88039645202. ✘ Square of the diameter

88039645203. ✘ Square root of the diameter

88039645204. ✘ Cube root of the diameter

Question Number : 22 Question Id : 88039611302 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A tie bar is welded to a plate as shown below. The length and width of weld is 100 mm on each side. For a size of fillet of 6 mm and the safe working stress (for all conditions) of fillet is 100 MPa, the strength of the fillet weld will be



Options :

- 88039645205. ✘ 76 kN
- 88039645206. ✘ 86 kN
- 88039645207. ✘ 116 kN
- 88039645208. ✔ 126 kN

Question Number : 23 Question Id : 88039611303 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

During transverse vibrations, shaft is subjected to

Options :

- 88039645209. ✘ Torsional shear stresses
- 88039645210. ✘ Tensile stresses
- 88039645211. ✔ Bending stresses

88039645212. ✘ Compressive stresses

Question Number : 24 Question Id : 88039611304 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The arrival rate and service rate usually follow

Options :

88039645213. ✘ Normal distribution and exponential law

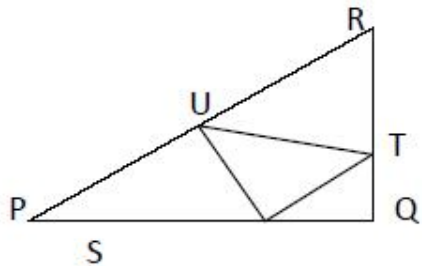
88039645214. ✔ Poisson distribution and exponential law

88039645215. ✘ Exponential law and Erlang distribution law

88039645216. ✘ Binomial distribution and normal distribution

Question Number : 25 Question Id : 88039611305 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In the given figure angle Q is a right angle, $PS : QS = 3: 1$, $RT : QT = 5: 2$ and $PU : UR = 1: 1$. If area of triangle QTS is 20 cm^2 , then the area of triangle PQR in cm^2 is



Options :

88039645217. ✘ 240 cm^2

88039645218. ✘ 260 cm^2

88039645219. ✔ 280 cm^2

88039645220. ✘ 300 cm^2

Question Number : 26 Question Id : 88039611306 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A body of mass 10 kg is initially stationary on an inclined plane of 45° . The kinematic coefficient of friction between the body and the plane is 0.5 . The body slides down the plane and attains velocity of 20 m/s . The acceleration developed in the body along the plane is

Options :

88039645221. ✘ 1.5 m/s^2

88039645222. ✘ 2.35 m/s^2

88039645223. ✔ 3.46 m/s^2

88039645224. ✘ 7.62 m/s^2

Question Number : 27 Question Id : 88039611307 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two balls are projected from the same point making angles 60° and 30° with the vertical axis. If both the balls are to attain the same height, the ratio of the speeds of projection V_1 / V_2 will be

Options :

88039645225. ✘ 1:2

88039645226. ✘ 1:1

88039645227. ✘ $1:\sqrt{2}$

88039645228. ✔ $1:\sqrt{3}$

Question Number : 28 Question Id : 88039611308 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A dummy activity is used in PERT network to describe

Options :

88039645229. ✓ Precedence relationship

88039645230. ✗ Necessary time delay

88039645231. ✗ Resource restriction

88039645232. ✗ Resource idleness

Question Number : 29 Question Id : 88039611309 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For the linear programming problem, Maximise $Z = 3X_1 + 2X_2$
subject to

$$-2X_1 + 3X_2 \leq 9$$

$$X_1 - 5X_2 \geq -20$$

$$X_1, X_2 \geq 0$$

The above problem has

Options :

88039645233. ✓ Unbounded solution

88039645234. ✗ Infeasible solution

88039645235. ✗ Alternative optimum solution

88039645236. ✘ Degenerate solution

Question Number : 30 Question Id : 88039611310 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The demand and forecast for February are 12000 and 10275 parts respectively. Using single exponential smoothing method having a coefficient of 0.3, the forecast for the month of March will be

Options :

88039645237. ✘ 9875 parts

88039645238. ✘ 10200 parts

88039645239. ✘ 10556 parts

88039645240. ✔ 10792 parts

Question Number : 31 Question Id : 88039611311 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In an Abrasive Jet Machining process, if Q is the mass flow rate of abrasives and d is the mean diameter of the abrasives, then Material removal rate is proportional to

Options :

88039645241. ✘ $Q \propto \frac{1}{d^2}$

88039645242. ✘ $Q \propto d$

88039645243. ✘ $Q \propto d^2$

88039645244. ✔ $Q \propto d^3$

Question Number : 32 Question Id : 88039611312 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a 2-D CAD package, clockwise circular arc radius of 5 specified from $P_1 (15,10)$ to $P_2 (10, 15)$ will have its centre at

Options :

88039645245. ✘ (10,10)

88039645246. ✘ (15,10)

88039645247. ✔ (15,15)

88039645248. ✘ (10,15)

Question Number : 33 Question Id : 88039611313 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Abbe's principle of alignment is used in

Options :

88039645249. ✘ Vernier calliper

88039645250. ✘ Depth vernier

88039645251. ✔ Internal calliper micrometer

88039645252. ✘ Height vernier

Question Number : 34 Question Id : 88039611314 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The ratio of tension on the tight side to that of slack side in a flat belt drive is

Options :

88039645253. ✘ proportional to the product of coefficient of friction and lap angle

88039645254. ✔ an exponential function of the product of coefficient of friction and lap angle

88039645255. ✘ proportional to the lap angle

88039645256. ✘ proportional to coefficient of friction

Question Number : 35 Question Id : 88039611315 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Inversion of a mechanism means

Options :

88039645257. ✘ converting a higher pair to lower pair

88039645258. ✘ turning it upside down

88039645259. ✓ obtain different mechanisms by fixing different links in a kinematic chain

88039645260. ✗ obtaining by reversing the input and output motion

Question Number : 36 Question Id : 88039611316 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In reciprocating engines, primary forces

Options :

88039645261. ✓ are completely balanced

88039645262. ✗ are partially balanced

88039645263. ✗ are balanced by secondary forces

88039645264. ✗ cannot be balanced

Question Number : 37 Question Id : 88039611317 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

There are six gears A, B, C, D, E and F in a compound train. The number of teeth in the gears are 20, 60, 30, 80, 25 and 75 respectively. The ratio of the angular speeds of the driven (F) to the driver (A) is

Options :

88039645265. ✓ $1/24$

88039645266. ✘ 1/8

88039645267. ✘ 4/15

88039645268. ✘ 12

Question Number : 38 Question Id : 88039611318 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The rotor shaft of large electric motor supported between short bearings at both ends shows a deflection of 2.1 mm in the middle of the rotor. Assuming the rotor to be perfectly balanced and supported at the knife edges at both the ends, the likely critical speed of the shaft in rpm will be

Options :

88039645269. ✘ 327

88039645270. ✔ 654

88039645271. ✘ 981

88039645272. ✘ 1308

Question Number : 39 Question Id : 88039611319 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An involute pinion and gear are in mesh. If both have the same size of addendum, then there will be an interference between the

Options :

88039645273. ✓ tip of the gear tooth and flank of pinion

88039645274. ✘ tip of the pinion and flank of gear

88039645275. ✘ flanks of both gear and pinion

88039645276. ✘ tip of both gear and pinion.

Question Number : 40 Question Id : 88039611320 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A single degree of freedom spring-mass-damper system is under damped conditions, an additional damper is added in parallel such that system still remains under damped.

Which of the following statement is true?

Options :

88039645277. ✘ Transmissibility will increase

88039645278. ✘ Transmissibility will decrease

88039645279. ✓ Time period of free oscillations will increase

88039645280. ✘ Time period of free oscillations will decrease

Question Number : 41 Question Id : 88039611321 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A machine element is subjected to the bi-axial state of stress having $\sigma_x = 80$ MPa; $\sigma_y = 20$ MPa; and $\tau_{xy} = 40$ MPa. If the shear strength of the material is 100 MPa, the factor of safety as per Tresca's maximum shear stress theory will be

Options :

88039645281. ✘ 1.0

88039645282. ✔ 2.0

88039645283. ✘ 2.5

88039645284. ✘ 3.5

Question Number : 42 Question Id : 88039611322 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The process of shot peening increases the fatigue life of steel springs mainly because it results in

Options :

88039645285. ✘ surface hardening

88039645286. ✘ increased stiffness of the material

88039645287. ✔ residual compressive stress in the surface

88039645288. ✘ compositional changes in the material

Question Number : 43 Question Id : 88039611323 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Two spur gears have a velocity ratio of $\frac{1}{3}$. The driven gear has 72 teeth of 8 mm module and rotates at 300 rpm. The pitch line velocity in meters/sec will be

Options :

88039645289. ✘ 13.56

88039645290. ✘ 18.08

88039645291. ✘ 4.52

88039645292. ✔ 9.04

Question Number : 44 Question Id : 88039611324 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The gradient resistance of a moving vehicle is independent of

Options :

88039645293. ✘ mass of the vehicle

88039645294. ✘ gradient of the surface

88039645295. ✔ speed of the vehicle

88039645296. ✘ angle of the surface

Question Number : 45 Question Id : 88039611325 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is not a transmission type dynamometer

Options :

88039645297. ✓ Rope brake dynamometer

88039645298. ✗ Belt transmission dynamometer

88039645299. ✗ Epicyclic Train dynamometer

88039645300. ✗ Bevis-Gibson Torsion dynamometer

Question Number : 46 Question Id : 88039611326 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is a criterion in the design of hydrodynamic journal bearings?

Options :

88039645301. ✓ Sommerfeld number

88039645302. ✗ Rated Life

88039645303. ✗ Rotation factor

88039645304. ✗ Specific dynamic capacity

Question Number : 47 Question Id : 88039611327 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A friction circle is drawn when a journal rotates in a bearing. Its radius depends on the co-efficient of friction and the

Options :

- 88039645305. ✘ magnitude of forces on the journal
- 88039645306. ✘ angular velocity of the journal
- 88039645307. ✘ clearance between the journal and the bearing
- 88039645308. ✔ radius of the journal

Question Number : 48 Question Id : 88039611328 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A double riveted double cover butt Joint of 20 mm thick plates is having rivets of 25mm diameter at a pitch of 100 mm. For permissible stress of 100 MPa in tension, the tearing strength of the plates will be

Options :

- 88039645309. ✘ 110 kN
- 88039645310. ✘ 130 kN
- 88039645311. ✔ 150 kN
- 88039645312. ✘ 200 kN

Question Number : 49 Question Id : 88039611329 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A body of mass m and radius of gyration k is to be replaced by two masses m_1 and m_2 located at distances h_1 and h_2 from the centre of gravity of the original body. An equivalent dynamic system will result, if

Options :

88039645313. ✘ $h_1 + h_2 = k$

88039645314. ✘ $h_1^2 + h_2^2 = k^2$

88039645315. ✔ $h_1 h_2 = k^2$

88039645316. ✘ $\sqrt{h_1 h_2} = k^3$

Question Number : 50 Question Id : 88039611330 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The volumetric strain in case of a thin cylindrical shell of diameter d , thickness t , subjected to internal pressure p is

Options :

88039645317. ✘ $\frac{p d}{2 t E} (3 - 4\mu)$

88039645318. ✘ $\frac{p d}{4 t E} (4 - 3\mu)$

88039645319. ✓ $\frac{p d}{4 t E} (5 - 4\mu)$

88039645320. ✗ $\frac{p d}{4 t E} (4 - 5\mu)$

Question Number : 51 Question Id : 88039611331 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A cantilever of length L, moment of inertia I, Young's modulus E carries a concentrated load W at the free end. The slope of cantilever at the free end is

Options :

88039645321. ✓ $\frac{WL^2}{2EI}$

88039645322. ✗ $\frac{WL^2}{4EI}$

88039645323. ✗ $-\frac{WL^2}{8EI}$

88039645324. ✗ $\frac{WL^2}{16EI}$

Question Number : 52 Question Id : 88039611332 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two solid circular shafts of radii R_1 and R_2 are subjected to same torque. If the maximum shear stresses developed in the two shafts are τ_1 and τ_2 . For a given ratio of $R_1 / R_2 = 2$, then τ_2 / τ_1 would be

Options :

88039645325. ✘ 4

88039645326. ✔ 8

88039645327. ✘ 16

88039645328. ✘ 64

Question Number : 53 Question Id : 88039611333 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A solid shaft can resist a bending moment of 3.0 kNm and a twisting moment of 4.0 kNm together, then the equivalent torque applied is

Options :

88039645329. ✔ 5 kNm

88039645330. ✘ 0.75 kNm

88039645331. ✘ 1.33 kNm

88039645332. ✘ 7.0 kNm

Question Number : 54 Question Id : 88039611334 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Raw material for all iron and steel production is

Options :

88039645333. ✘ Cast iron

88039645334. ✘ Wrought iron

88039645335. ✔ Pig Iron

88039645336. ✘ Stainless steel

Question Number : 55 Question Id : 88039611335 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a unit cell of a body centred cubic space lattice, the total numbers of atoms are

Options :

88039645337. ✔ 2

88039645338. ✘ 9

88039645339. ✘ 12

88039645340. ✘ 24

Question Number : 56 Question Id : 88039611336 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Dielectric strength means

Options :

88039645341. ✓ Insulating capacity against voltage

88039645342. ✗ Conductive capacity against voltage

88039645343. ✗ High flowing capacity

88039645344. ✗ Low flowing capacity

Question Number : 57 Question Id : 88039611337 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Line imperfection in a crystal is called

Options :

88039645345. ✗ Frenkel defect

88039645346. ✗ Schottky defect

88039645347. ✗ Miller defect

88039645348. ✓ Edge dislocation

Question Number : 58 Question Id : 88039611338 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Brinell hardness number is given by the relation (when P is load on the indentation tool,
D is Diameter of steel ball and d is the impression at the rim)

Options :

88039645349. ✘ $\frac{P}{\pi(D-\sqrt{D^2-d^2})}$

88039645350. ✘ $\frac{P}{\pi D(D-\sqrt{D^2-d^2})}$

88039645351. ✘ $\frac{2P}{\pi(D-\sqrt{D^2-d^2})}$

88039645352. ✔ $\frac{2P}{\pi D(D-\sqrt{D^2-d^2})}$

Question Number : 59 Question Id : 88039611339 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

In full mould (cavity-less) casting process, the pattern is made of

Options :

88039645353. ✔ Expanded polystyrene

88039645354. ✘ Wax

88039645355. ✘ Epoxy

88039645356. ✘ Plaster of Paris

Question Number : 60 Question Id : 88039611340 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Chilled surfaces are marked on the pattern by

Options :

88039645357. ✘ oblique and red strips

88039645358. ✘ yellow and cross strips

88039645359. ✘ black cross strips on yellow

88039645360. ✔ oblique red strips on yellow

Question Number : 61 Question Id : 88039611341 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An aluminium cube of 10 cm side has to be cast. The volume shrinkage of aluminium during solidification is 6%. Volume of cube after solidification will be

Options :

88039645361. ✘ 350 cm^3

88039645362. ✘ 570 cm^3

88039645363. ✔ 940 cm^3

88039645364. ✘ 1060 cm³

Question Number : 62 Question Id : 88039611342 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Cold pressed ceramics are also known as

Options :

88039645365. ✘ Grey ceramics

88039645366. ✘ Black ceramics

88039645367. ✔ White ceramics

88039645368. ✘ Brown ceramics

Question Number : 63 Question Id : 88039611343 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Match the following products with preferred manufacturing processes:

	Product		Process
P	Rails	(1)	Injection Blow moulding
Q	Engine crankshaft	(2)	Extrusion
R	Aluminium Channels	(3)	Forging
S	PET water bottles	(4)	Rolling

Options :

88039645369. ✘ P-4, Q-3, R-1, S-2

88039645370. ✓ P-4, Q-3, R-2, S-1

88039645371. ✘ P-2, Q-4, R-3, S-1

88039645372. ✘ P-3, Q-4, R-2, S-1

Question Number : 64 Question Id : 88039611344 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Sheet moulding compounds (SMC) generally have

Options :

88039645373. ✓ Longer glass fibres and higher glass loading

88039645374. ✘ Longer glass fibres and lesser glass loading

88039645375. ✘ Shorter glass fibres and higher glass loading

88039645376. ✘ Shorter glass fibres and lesser glass loading

Question Number : 65 Question Id : 88039611345 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Briquetting is a process of

Options :

88039645377. ✘ converting powders to hot compacts

88039645378. ✓ converting loose powder to a green compact

88039645379. ✘ Soaking powders to bars

88039645380. ✘ Soaking powders to plates

Question Number : 66 Question Id : 88039611346 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which two of the following joining processes can be termed as Autogeneous?

- (I) Diffusion welding
- (II) Electro-slag welding
- (III) Friction welding
- (IV) Tungsten Inert Gas welding

Options :

88039645381. ✘ (I) and (IV)

88039645382. ✘ (II) and (III)

88039645383. ✘ (II) and (IV)

88039645384. ✔ (I) and (III)

Question Number : 67 Question Id : 88039611347 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Dual phase steels which are much more ductile have following phases

Options :

88039645385. ✔ Martensite and ferrite

88039645386. ✘ Martensite and pearlite

88039645387. ✘ Martensite and cementite

88039645388. ✘ Martensite and austenite

Question Number : 68 Question Id : 88039611348 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Compared to conventional rolling process, the rolls in Roll forging are

Options :

88039645389. ✘ large

88039645390. ✔ small

88039645391. ✘ rough

88039645392. ✘ smooth

Question Number : 69 Question Id : 88039611349 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Electrode gets consumed in which of the following welding process

Options :

88039645393. ✔ Arc welding

88039645394. ✘ Gas welding

88039645395. ✘ Resistance welding

88039645396. ✘ Thermit welding

Question Number : 70 Question Id : 88039611350 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A DC power source used for arc welding is governed by characteristic equation $3V + I = 240$, where V is voltage and I is current in amp in the welding process. For maximum power at the electrode, voltage should be set at

Options :

88039645397. ✘ 20 V

88039645398. ✔ 40 V

88039645399. ✘ 60 V

88039645400. ✘ 80 V

Question Number : 71 Question Id : 88039611351 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A cup having bottom corner radius of 1.8 mm is to be drawn of height 50 mm and outside diameter 50 mm from blank of 1.0 mm thickness. The diameter of blank will be

Options :

88039645401. ✘ 100 mm

88039645402. ✔ 112 mm

88039645403. ✘ 125 mm

88039645404. ✘ 140 mm

Question Number : 72 Question Id : 88039611352 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The machining time to turn a shaft of 50 mm diameter for a length of 76 mm at a cutting speed of 100 m/min and feed of 0.75 mm/rev will be

Options :

88039645405. ✘ 0.8 min

88039645406. ✘ 0.36 min

88039645407. ✘ 0.29 min

88039645408. ✔ 0.16 min

Question Number : 73 Question Id : 88039611353 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A slot 25 mm deep is to be cut through a work piece 200 mm long with the help of HSS side and face cutter whose diameter is 150 mm that has 10 teeth. The machine tool table over-travel will be

Options :

- 88039645409. ✘ 45.5 mm
- 88039645410. ✘ 48.8 mm
- 88039645411. ✘ 52.7 mm
- 88039645412. ✔ 55.9 mm

Question Number : 74 Question Id : 88039611354 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An Engine lathe has set up time of 15 min and unit time as 15 min as compared to an Automatic lathe which has a set up time of 90 min and unit time of 1.5 min. Automatic lathe shall be more economical to use when job lots are

Options :

- 88039645413. ✘ upto 2 units
- 88039645414. ✘ 2 to 4 units
- 88039645415. ✘ Only 5 units
- 88039645416. ✔ Greater than or equal to 6 units

Question Number : 75 Question Id : 88039611355 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Collets are chucks to hold

Options :

88039645417. ✓ bar stock of small size

88039645418. ✗ bar stock of large size

88039645419. ✗ rectangular blocks of small size

88039645420. ✗ rectangular blocks of large size

Question Number : 76 Question Id : 88039611356 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

ISO has prescribed _____ number of basic holes / shafts for specifying tolerance zone.

Options :

88039645421. ✗ 22

88039645422. ✓ 28

88039645423. ✗ 32

88039645424. ✗ 36

Question Number : 77 Question Id : 88039611357 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

As per ISO H₇f₇ hole/shaft combination is a

Options :

88039645425. ✓ Clearance fit

88039645426. ✗ Transition fit

88039645427. ✗ Interference fit

88039645428. ✗ Snug fit

Question Number : 78 Question Id : 88039611358 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Multidirectional lay pattern is obtained in which of the following process

Options :

88039645429. ✗ Boring

88039645430. ✗ Grinding

88039645431. ✓ Lapping

88039645432. ✗ End milling

Question Number : 79 Question Id : 88039611359 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A 300 mm diameter is turned at 45 rev/min with a depth of cut of 2 mm and a feed of 0.3 mm/rev. The forces measured at the cutting tool are Cutting force 1850 N and feed force 450 N. The cutting power and feed power respectively are

Options :

88039645433. ✘ 1.2 kW and 0.02 kW

88039645434. ✘ 1.28 kW and 0.05 kW

88039645435. ✔ 1.30 kW and 0.10 kW

88039645436. ✘ 1.56 kW and 0.15 kW

Question Number : 80 Question Id : 88039611360 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question

Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The annual demand for an item is 4000 units. The ordering cost per order is Rs. 150, the inventory holding cost based on average inventory is 20%, the cost per unit is Rs. 5 and the storage cost based on maximum inventory is one rupee per unit per year. The Economic Order Quantity will be

Options :

88039645437. ✘ 10 units

88039645438. ✘ 100 units

88039645439. ✓ 1000 units

88039645440. ✗ 10000 units

Question Number : 81 Question Id : 88039611361 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The function of interpolator in a CNC machine controller is to

Options :

88039645441. ✗ Control spindle speed

88039645442. ✗ Coordinate feed rates of axes

88039645443. ✓ Control tool rapid approach speed and direction

88039645444. ✗ Perform Miscellaneous (M) functions (such as tool change, coolant control etc.)

Question Number : 82 Question Id : 88039611362 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Holes of diameter $25.0_{-0.000}^{+0.020}$ mm are assembled interchangeably with the pins of diameter $25.0_{-0.018}^{-0.005}$ mm. The minimum clearance in the assembly will be

Options :

88039645445. ✓ 0.005 mm

88039645446. ✗ 0.015 mm

88039645447. ✘ 0.025 mm

88039645448. ✘ 0.008 mm

Question Number : 83 Question Id : 88039611363 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The pressure coefficient in fluid flow may be given as

Options :

88039645449. ✘ $\frac{\Delta P}{\rho \mu v}$

88039645450. ✔ $\frac{2\Delta P}{\rho v^2}$

88039645451. ✘ $\frac{\Delta P}{\rho \mu^2 v^2}$

88039645452. ✘ $\frac{\Delta P}{\rho \mu v t}$

Question Number : 84 Question Id : 88039611364 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Wake occurs in a flow

Options :

88039645453. ✘ before a separation point

88039645454. ✔ after a separation point

88039645455. ✘ before and after separation point

88039645456. ✘ not related to separation point

Question Number : 85 Question Id : 88039611365 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the stream function is $\psi = 2xy$, then the velocity at a point (1,2) is equal to

Options :

88039645457. ✘ 2

88039645458. ✘ 4

88039645459. ✔ $\sqrt{20}$

88039645460. ✘ 16

Question Number : 86 Question Id : 88039611366 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Biot number is described as

Options :

88039645461. ✘ The ratio of heat conducted to heat convected

88039645462. ✘ The ratio of heat convected to heat conducted

88039645463. ✘ The ratio of external convective resistance to internal conductive resistance

88039645464. ✔ The ratio of internal conductive resistance to external convective resistance

Question Number : 87 Question Id : 88039611367 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A pump handling a liquid raises its pressure from 1 bar to 35 bar. Taking the density of liquid as 1000 kg/m^3 the isentropic specific work done by the pump in kJ/kg is

Options :

88039645465. ✘ 1.0 kJ/kg

88039645466. ✘ 1.4 kJ/kg

88039645467. ✘ 2.4 kJ/kg

88039645468. ✔ 3.4 kJ/kg

Question Number : 88 Question Id : 88039611368 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

When α is the absorptivity, ρ is reflectivity and τ is transmissivity, then for diathermanous body, which of the following values are valid.

Options :

88039645469. ✓ $\alpha=0, \rho=0, \tau=1$

88039645470. ✗ $\alpha=1, \rho=0, \tau=0$

88039645471. ✗ $\alpha=0.5, \rho=0.5, \tau=0$

88039645472. ✗ $\alpha+\rho=1, \tau=0$

Question Number : 89 Question Id : 88039611369 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A heat reservoir at 1000 K is brought into contact with the ambient at 300 K for a short time. During this contact 10000 kJ of heat is lost by the reservoir. The total availability loss due to this process is close to

Options :

88039645473. ✗ 1600 kJ

88039645474. ✗ 1850 kJ

88039645475. ✗ 4550 kJ

88039645476. ✓ 7000 kJ

Question Number : 90 Question Id : 88039611370 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Orsat's apparatus is employed to determine

Options :

88039645477. ✘ Ultimate analysis of fuel

88039645478. ✘ Gravimetric analysis of fuel

88039645479. ✔ Volumetric analysis of dry products of combustion

88039645480. ✘ Gravimetric analysis of dry products of combustion

Question Number : 91 Question Id : 88039611371 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following are intensive properties

- I Kinetic Energy
- II Specific Enthalpy
- III Pressure
- IV Entropy

Select the correct answer in the following for above options

Options :

88039645481. ✘ I and III

88039645482. ✔ II and III

88039645483. ✘ I, III and IV

88039645484. ✘ II and IV

Question Number : 92 Question Id : 88039611372 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

An industrial heat pump operates between temperatures of 27°C and -15°C . The heat is added at a rate of 800 W and rejected at a rate of 1000 W. The COP of the heat pump shall be

Options :

88039645485. ✘ 2

88039645486. ✘ 3

88039645487. ✘ 4

88039645488. ✔ 5

Question Number : 93 Question Id : 88039611373 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The process where there is no work transfer is involved is

Options :

88039645489. ✘ Adiabatic expansion

88039645490. ✘ Isothermal expansion

88039645491. ✘ Polytropic Expansion

88039645492. ✓ Free Expansion

Question Number : 94 Question Id : 88039611374 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Function of a carburettor in an IC engine is to supply

Options :

88039645493. ✓ mixture of air and petrol

88039645494. ✘ mixture of air and diesel

88039645495. ✘ only petrol

88039645496. ✘ only diesel

Question Number : 95 Question Id : 88039611375 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two fluids, A and B exchange heat in a counter-current heat exchanger. Fluid enters at 420°C and has a mass flow rate of 1 kg/s . Fluid B enters at 20°C and also has a mass rate of 1 kg/s . Effectiveness of heat exchanger is 75% . Specific heat of fluid A is 1 kJ/kgK and that of Fluid B is 4 kJ/kgK . Exit temperature of fluid B will

Options :

88039645497. ✘ 75°C

88039645498. ✘ 85°C

88039645499. ✔ 95°C

88039645500. ✘ 105°C

Question Number : 96 Question Id : 88039611376 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An air-standard Diesel cycle consists of the following processes: 1-2: Air is compressed isentropically. 2-3: Heat is added at constant pressure. 3-4: Air expands isentropically to the original volume. 4-1: Heat is rejected at constant volume. If γ and T denote the specific heat ratio and temperature at process points, respectively, the efficiency of the cycle is

Options :

88039645501. ✘ $1 - \frac{(T_4 - T_1)}{(T_3 - T_2)}$

88039645502. ✘ $1 - \frac{\gamma(T_4 - T_1)}{(T_3 - T_2)}$

88039645503. ✔ $1 - \frac{(T_4 - T_1)}{\gamma(T_3 - T_2)}$

88039645504. ✘ $1 - \frac{(\gamma - 1)(T_4 - T_1)}{(T_3 - T_2)}$

Question Number : 97 Question Id : 88039611377 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What shall be the cross sectional diameter in (m) of a chimney, if 10 m^3 of hot air flows through it at a velocity of 2.5 m/s.

Options :

88039645505. ✘ $1/\sqrt{\pi}$

88039645506. ✘ $2/\sqrt{\pi}$

88039645507. ✘ $3/\sqrt{\pi}$

88039645508. ✔ $4/\sqrt{\pi}$

Question Number : 98 Question Id : 88039611378 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A fuel of calorific value 41800 kJ/kg burns in a boiler having the equivalent evaporation of 15 kg/kg of fuel from and at 100°C . If the latent heat of steam at atmospheric is 2250 kJ/kg of steam. The efficiency of the boiler will be nearly

Options :

88039645509. ✘ 65%

88039645510. ✘ 70%

88039645511. ✘ 75%

88039645512. ✔ 80%

Question Number : 99 Question Id : 88039611379 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Joule Thomson coefficient for an ideal gas having equation $pV=RT$ is

Options :

88039645513. ✔ zero

88039645514. ✘ 0.5

88039645515. ✘ unity

88039645516. ✘ infinity

Question Number : 100 Question Id : 88039611380 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A cycle consisting of two reversible isothermal processes and two reversible isobaric processes is known as

Options :

88039645517. ✘ Atkinson cycle

88039645518. ✘ Stirling Cycle

88039645519. ✘ Brayton cycle

88039645520. ✔ Ericsson cycle

Question Number : 101 Question Id : 88039611381 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which of the following is not used as compressor blade material

Options :

88039645521. ✔ Copper

88039645522. ✘ Steel

88039645523. ✘ Fibrous composites

88039645524. ✘ Titanium

Question Number : 102 Question Id : 88039611382 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Oil separator in a refrigeration cycle is installed

Options :

88039645525. ✔ between compressor and condenser

88039645526. ✘ between compressor and evaporator

88039645527. ✘ between evaporator and expansion valve

88039645528. ✘ between expansion valve and condenser

Question Number : 103 Question Id : 88039611383 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The sensible heat factor for auditorium or cinema hall is generally kept as

Options :

88039645529. ✘ 0.6

88039645530. ✔ 0.7

88039645531. ✘ 0.8

88039645532. ✘ 0.85

Question Number : 104 Question Id : 88039611384 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In an air standard diesel cycle, the compression ratio is 13 and the fuel is cut off at 8% of the stroke. Take clearance volume as 1 m^3 . The cut off ratio will be

Options :

88039645533. ✘ 1.56

88039645534. ✘ 1.76

88039645535. ✘ 1.86

88039645536. ✔ 1.96

Question Number : 105 Question Id : 88039611385 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A Francis turbine running at 200 rpm develops a power of 1000 kW under a head of 25 m. For the same speed, the power produced for a head of 100 m will be

Options :

88039645537. ✘ 28,000 kW

88039645538. ✔ 32,000 kW

88039645539. ✘ 40,000 kW

88039645540. ✘ 48,000 kW

Question Number : 106 Question Id : 88039611386 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Double hemispherical shaped buckets are used in the runner of

Options :

88039645541. ✓ Pelton wheel

88039645542. ✘ Kaplan turbine

88039645543. ✘ Francis turbine

88039645544. ✘ Propeller turbine

Question Number : 107 Question Id : 88039611387 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The gas turbine cycle with regenerator improves

Options :

88039645545. ✓ thermal efficiency

88039645546. ✘ work ratio

88039645547. ✘ turbine pollution

88039645548. ✘ turbine cleaning

Question Number : 108 Question Id : 88039611388 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Reheating in a turbine cycle

Options :

88039645549. ✘ increases efficiency

88039645550. ✘ decreases work output

88039645551. ✔ decreases efficiency and increases work output

88039645552. ✘ increases efficiency and decreases work output

Question Number : 109 Question Id : 88039611389 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The optimal intermediate pressure for the minimum work input for a two stage reciprocating compressor having suction at 1 bar and delivery at 9 bar will be

Options :

88039645553. ✘ 8 bar

88039645554. ✘ 81 bar

88039645555. ✘ 10 bar

88039645556. ✔ 3 bar

Question Number : 110 Question Id : 88039611390 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Polytropic or small stage efficiency in dynamic compression is given by

Options :

88039645557. ✘ $\frac{Y-1}{Y} \frac{n-1}{n}$

88039645558. ✘ $\frac{Y}{Y-1} \frac{n-1}{n}$

88039645559. ✔ $\frac{Y-1}{Y} \frac{n}{n-1}$

88039645560. ✘ $\frac{Y}{Y-1} \frac{n}{n-1}$

Question Number : 111 Question Id : 88039611391 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A composite plane wall is made up of two different materials of the same thickness and having thermal conductivities of k_1 and k_2 respectively. The equivalent thermal conductivity of the slab is

Options :

88039645561. ✘ $k_1 + k_2$

88039645562. ✘ $k_1 k_2$

88039645563. ✘ $\frac{k_1 + k_2}{k_1 k_2}$

88039645564. ✓ $\frac{2k_1k_2}{k_1 + k_2}$

Question Number : 112 Question Id : 88039611392 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If a is the optimistic time, b is the pessimistic time and m is most likely time of an activity, then expected time of activity is

Options :

88039645565. ✘ $\frac{a + m + b}{6}$

88039645566. ✘ $\frac{a + 2m + b}{6}$

88039645567. ✓ $\frac{a + 4m + b}{6}$

88039645568. ✘ $\frac{a + 5m + b}{6}$

Question Number : 113 Question Id : 88039611393 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In a weaving operation, the parameter to be controlled is the number of defects per 10 square yards of material. Control chart appropriate for this task is

Options :

88039645569. ✘ P-chart

88039645570. ✔ C-chart

88039645571. ✘ R-chart

88039645572. ✘ X-chart

Question Number : 114 Question Id : 88039611394 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In a two dimensional cutting model, Chip thickness ratio (r) is the ratio of

Options :

88039645573. ✘ cutting velocity to chip velocity

88039645574. ✔ depth of cut to chip thickness

88039645575. ✘ chip thickness to depth of cut

88039645576. ✘ shear velocity to cutting velocity

Question Number : 115 Question Id : 88039611395 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two castings of the same metal have the same surface area. One casting is in form of a sphere and the other is a cube. What is the ratio of the solidification time for the sphere to that of the cube?

Options :

88039645577. ✘ $\frac{3\pi}{4}$

88039645578. ✘ $\frac{3\pi}{8}$

88039645579. ✘ $\frac{5}{4\pi}$

88039645580. ✔ $\frac{6}{\pi}$

Question Number : 116 Question Id : 88039611396 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A bicycle remains stable in running through a bend because of

Options :

88039645581. ✔ Gyroscopic action

88039645582. ✘ Coriolis component of acceleration

88039645583. ✘ Centrifugal action

88039645584. ✘ Radius of curved path

Question Number : 117 Question Id : 88039611397 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A perfectly incompressible isotropic material deformed elastically at small strains would have a Poisson's ratio of exactly

Options :

88039645585. ✘ 0

88039645586. ✘ 0.25

88039645587. ✔ 0.5

88039645588. ✘ 0.75

Question Number : 118 Question Id : 88039611398 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The density of supersaturated steam is about _____ that of the ordinary saturated vapour at the corresponding pressure

Options :

88039645589. ✘ same as

88039645590. ✘ 2 times

88039645591. ✘ 4 times

88039645592. ✔ 8 times

Question Number : 119 Question Id : 88039611399 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In a boiler, various heat losses take place. The biggest loss is due to

Options :

88039645593. ✘ Moisture in fuel

88039645594. ✔ Dry flue gases

88039645595. ✘ Unburnt carbon

88039645596. ✘ Boiler shell

Question Number : 120 Question Id : 88039611400 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Kelvin- Planck's law deals with

Options :

88039645597. ✘ conservation of work

88039645598. ✘ conservation of heat

88039645599. ✘ conservation of mass

88039645600. ✔ conversion of heat into work

