Question 1

Not yet answered

Marked out of 2.00

Flag question

The state of plane stress at a point is represented by the stress Matrix below. Find the principal angle for the minimum stress:

$$\begin{pmatrix} 80 & 20 \\ 20 & -45 \end{pmatrix}$$

a. 10.5°

b. 100.5°

c. 98.87°

d. 17.74 °

e. 8.87°

Answer:

Question 6

Not yet answered

Marked out of 3.00

Flag question

what is the pitch for the bolt having the designation 1/2 UNC

Select one:

- a. 13 in
- b. 0.5 in
- c. 0.0769 in
- d. 0.77 in

Clear my choice

Previous page

Next page

Question 2

Not yet answered

Marked out of 3.00

Flag question

Time left 0:34:07

A power screw made from steel and the nut is made from steel. Machine oil is used as lubrication between the screw and nut. In order to have self locking the lead angle λ (depending on the value of f) can be :

a. less than 6.28 or between 6.28 and 9.65

b. less than 3.43 or between 3.43 and 5.14

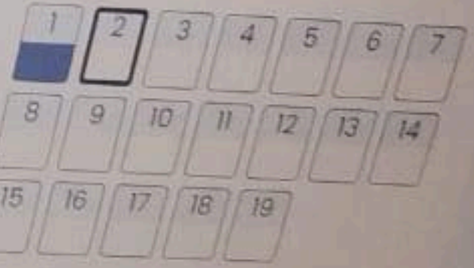
c. less than 3.43 only

d. higher than 5.14

e. less than 5.71 or between 5.71 and 9.09

Next page

Quiz navigation



Finish attempt ...

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Question 2

Not yet answered

Marked out of 3.00

Flag question

Time left 0:34:07

A power screw made from steel and the nut is made from steel. Machine oil is used as lubrication between the screw and nut. In order to have self locking the lead angle λ (depending on the value of f) can be :

a. less than 6.28 or between 6.28 and 9.65

b. less than 3.43 or between 3.43 and 5.14

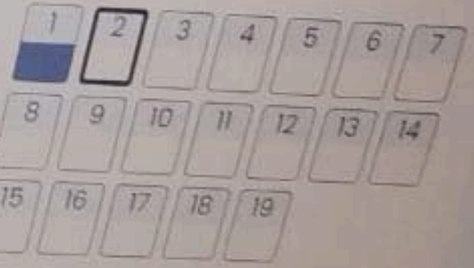
c. less than 3.43 only

d. higher than 5.14

e. less than 5.71 or between 5.71 and 9.09

Next page

Quiz navigation



Finish attempt ...

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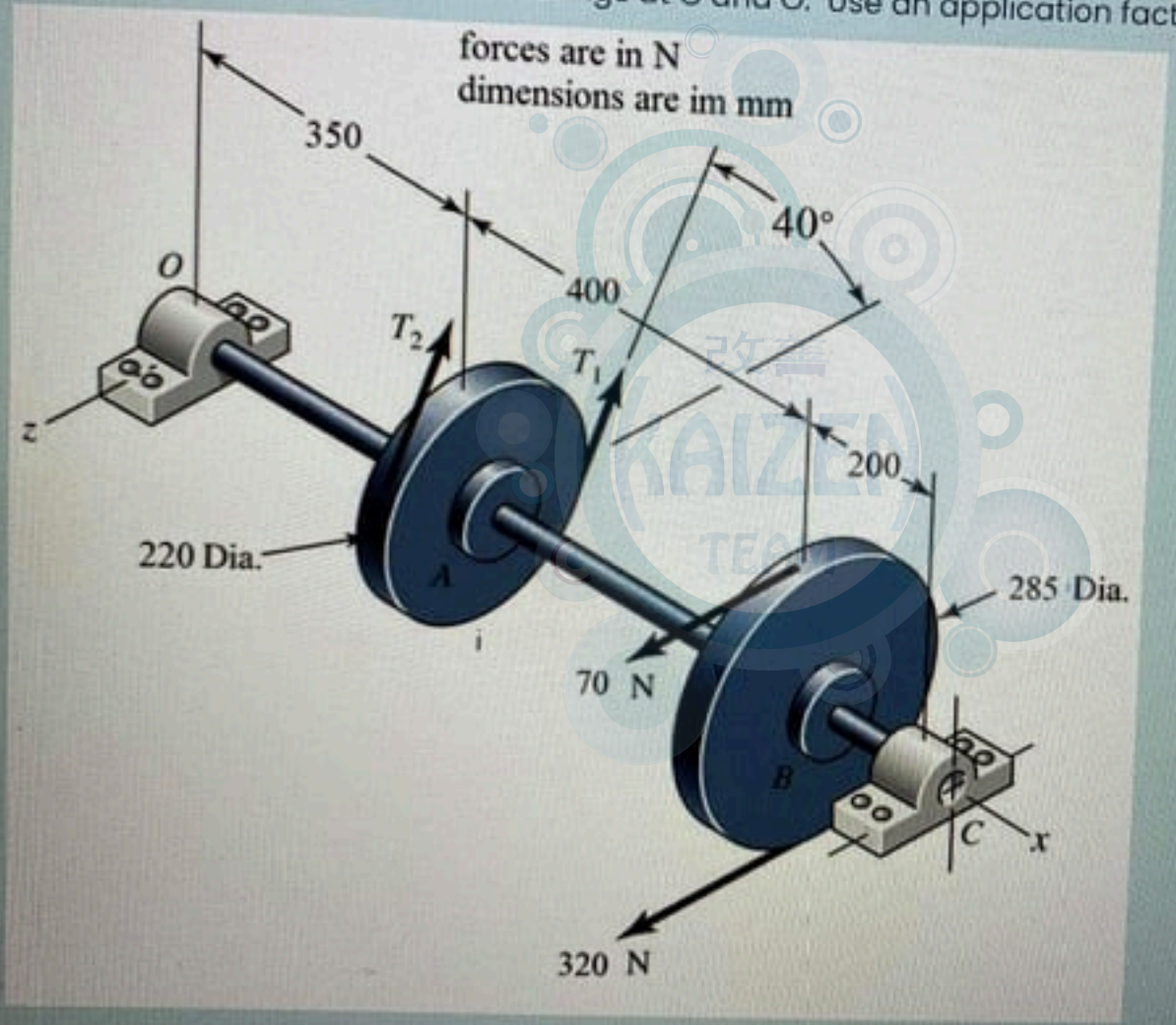
have a life of 80 kh at a combined reliability of 0.99. The countershaft runs at 1600 rev/min. The belt tension on the loose side of pulley *A* is 10 percent of the tension on the tight side. The radial reaction at point O is 194.4 N and the radial reaction at point C is 217.42 N.Two angular contact ball bearings having D_{bor} =20 mm and OD= 47 have been selected for position C and position O. If a 100 N axial stress is applied at point C in the -x direction what will be the new bearings at C and O. Use an application factor of 1.2



Answer:

Flag question

If the life of a ball bearing at a load of 9 kN is 9000 hours what will be its life in hours if the load is increased to 18 kN at the same rated reliability.

- a. 1125 hours
- b. 1125 RPM
- c. 1000000 rpm
- d. 9000 hours
- e. 18000 hours

Next page

Rated life of a group of identical ball bearings is the number of revolutions before the first signs of fatigue appears by :

- a. 100% of the bearings of the group
- b. 95% of the bearings of the group
- c. 90% of the bearings of the group
- d. 10% of the bearings of the group
- e. none of them is correct

Clear my choice

Next pag

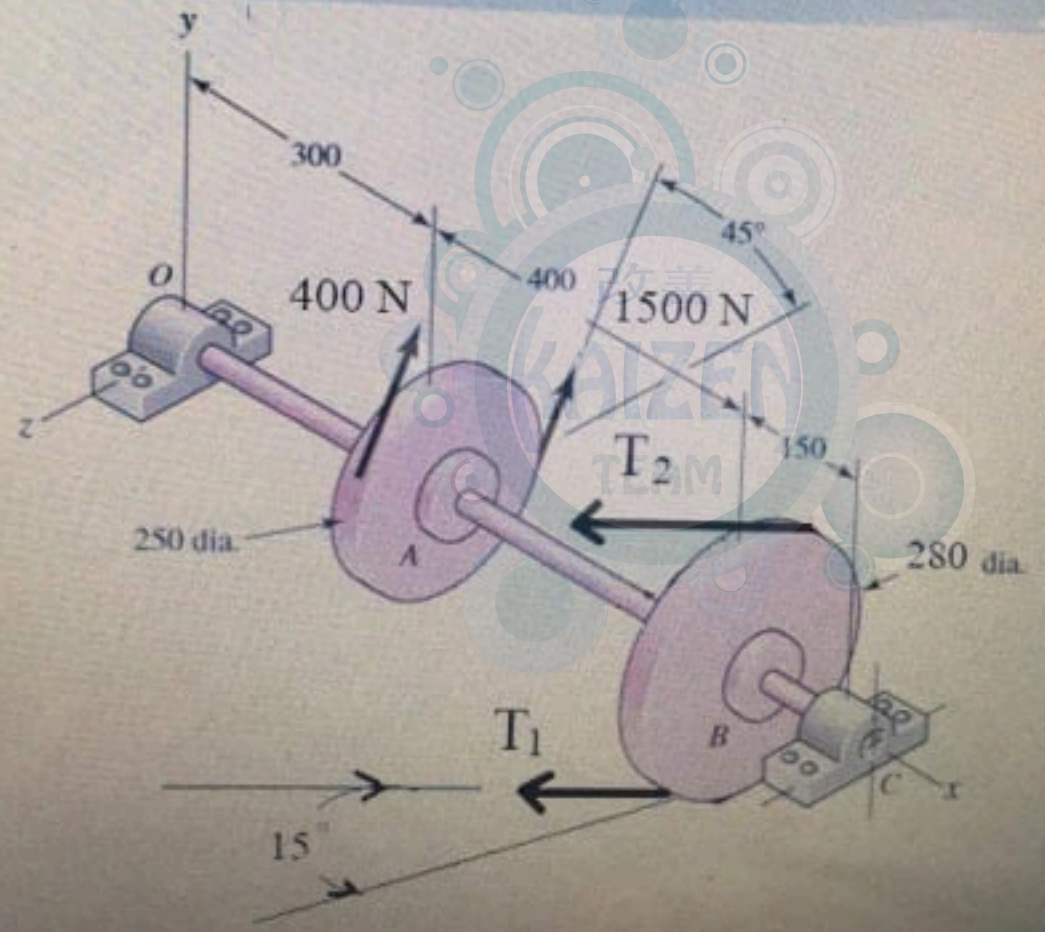
Question 12

Not yet answered

Marked out of 2.00

Flag question

A belt-driven jack-shaft is shown in the figure below. The shaft is made of AISI 1050 CD and is driven by a motor at 1500 rpm. The power is transmitted through the shaft and delivered to the belt on pulley *B*. Assume the belt tension on the loose side at *B* is 16 percent of the tension on the tight side.: What is the value of T1



Quiz navigation

1 2 3 4 7 8 9 10 13 14

Finish attempt

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Time left 0:29:46

Question 3

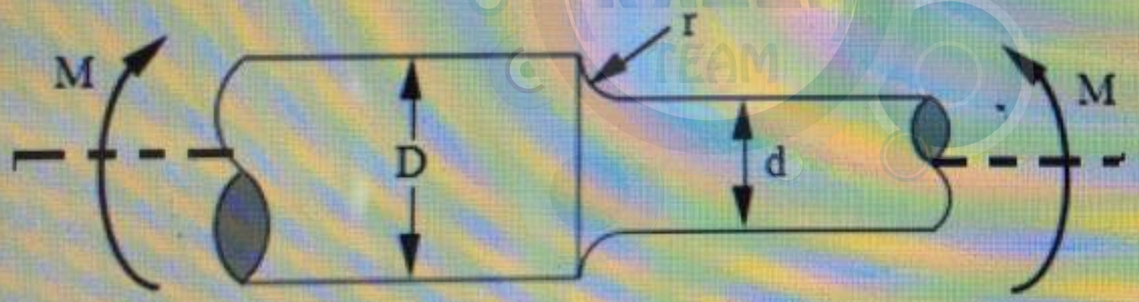
Not yet answered

Marked out of 3.00

Flag question

A shaft having a shoulder is loaded with bending stresses such that the following stresses are created at a particular location: Bending: Fluctuating stress from −50 MPa to 200 MPa

The steel from which it is manufactured has a yield strength of 304. The notch sensitivity factors for bending is Kf= 1.6 . What is the yielding facor of saftey



Answer:

Question 8

Not yet answered

Marked out of 3.00

Flag question

A power screw is 28 mm in diameter and has a thread pitch of 5 mm. Find the root diameter provided square threads are used

Select one:

- a. 20 mm
- b. 28 mm
- c. 5 mm
- d. 23 mm

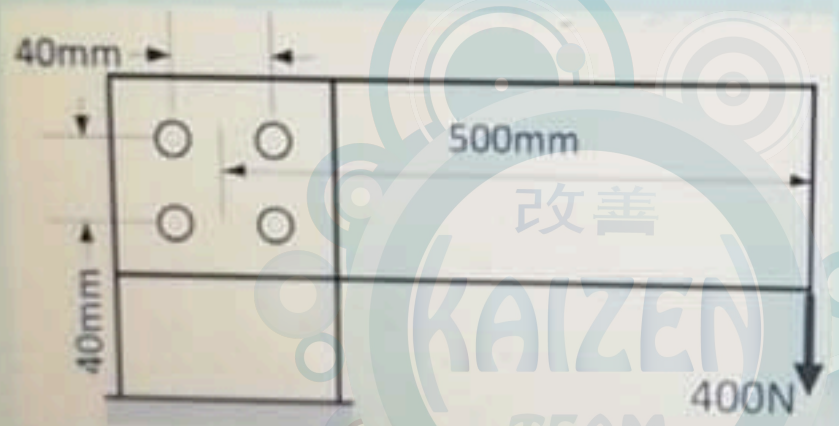
Clear my choice

Question 9

Not yet

For a given loading condition and material, the fatigue factor of safety is determined to be 1. What would happen to the fatigue factor of safety if the only

A horizontal plate has been joined to a vertical post using four bolts a
figure. The magnitude of the maximum load (in N) is



Answer: 1845

A steel link with a diameter of 40 mm is subjected to an axial force that v
compression to 180 kN in tension. The tensile strength (S_{ut}), yield strength
endurance (S_e) limit of the steel material are 600 MPa, 420 MPa and 240
factor of safety against fatigue according to Soderberg's criterion is

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Final Exam (page 4 of 19

A horizontal plate has b

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ENGINEERING DESIGN

General

Final Exam

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Tin

A single start square threaded power screw supports load of 30 kN which has o
diameter of 30 mm and a pitch of 8 mm. Maximum bending stress at root of thre
N/mm^2 is induced in a screw body. Determine number of screw threads

a. 2 threads

b. 11 threads

c. 13 threads

d. None of the values is correct

e.

Clear my choice

Time le t 0:16:58

Question 3

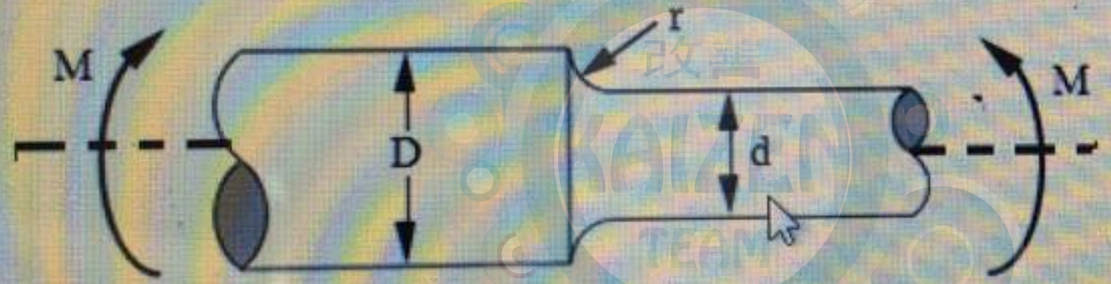
Not yet answered

Marked out of 3.00

Flag question

A shaft having a shoulder is loaded with bending stres s such that the following stres es are created at a particular location: Bending: Fluctuati g stress from −50 MPa to 200 M

The steel from which it is manufactured has a yield st ngth of 304. The notch sensitivi factors for bending is Kf= 1.6 . What is the yielding facor saftey



Answer: 5

Time le t 0:16:58

Question 3

Not yet answered

Marked out of 3.00

Flag question

A shaft having a shoulder is loaded with bending stres s such that the following stres es are created at a particular location: Bending: Fluctuati g stress from −50 MPa to 200 M

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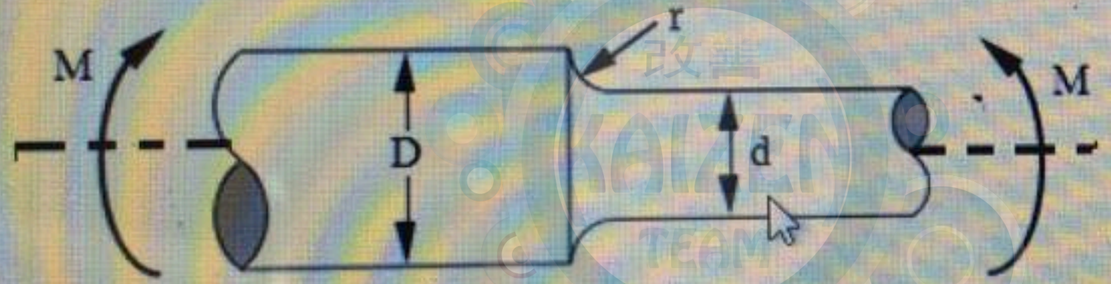

Answer: 5

Time left 0:34:24

If a bolts body stresses are σx=48 MPa σy= -12 MPa and shear stress T_{yz}= 5 MPa what is the von Misses stress:

- a. 59.58 MPa
- b. 56.11 MPa
- c. 56.7 MPa
- d. 55.67 MPa
- e. none of the values is true

Clear my choice

Next page

Quiz navigation

1 2 3 4 5 6 7
9 10 11 12 13 14 15
17 18 19

Finish attempt ...

Question 1

Not yet answered

Marked out of 3.00

Flag question

Time left 0:45:26

A screw jack with a 1 in double thread ACME screw is used to raise a load of 5000 N. Determine the pitch diameter and root diameter

- a. 0.9 in and 0.8 in
- b. 1.375 in and 1.25 in
- c. 1.15 in and 1.05 in
- d. 1.625 in and 1.5 in
- e. 3.2 in and 2.2 in

Clear my choice

Next page

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Question 1

Not yet answered

Marked out of 3.00

Flag question

Time left 0:45:26

A screw jack with a 1 in double thread ACME screw is used to raise a load of 5000 N. Determine the pitch diameter and root diameter

- a. 0.9 in and 0.8 in
- b. 1.375 in and 1.25 in
- c. 1.15 in and 1.05 in
- d. 1.625 in and 1.5 in
- e. 3.2 in and 2.2 in

Clear my choice

Next page

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ENGINEERING DESIGN

Time left 0:22:47

Question 3

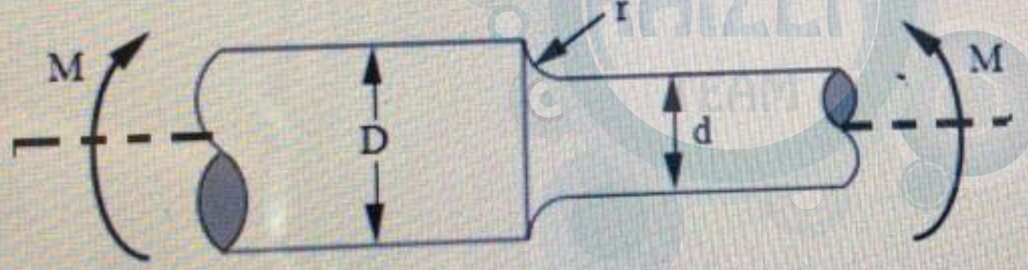
Not yet answered

Marked out of 3.00

Flag question

A shaft having a shoulder is loaded with bending stresses such that the following stresses are created at a particular location: Bending: Fluctuating stress from −50 MPa to 200 MPa

The steel from which it is manufactured has a yield strength of 304. The notch sensitivity factors for bending is Kf= 1.6 . What is the yielding facor of saftey



Answer:

Quiz no

1 2 7 8 13 14 19

Finish

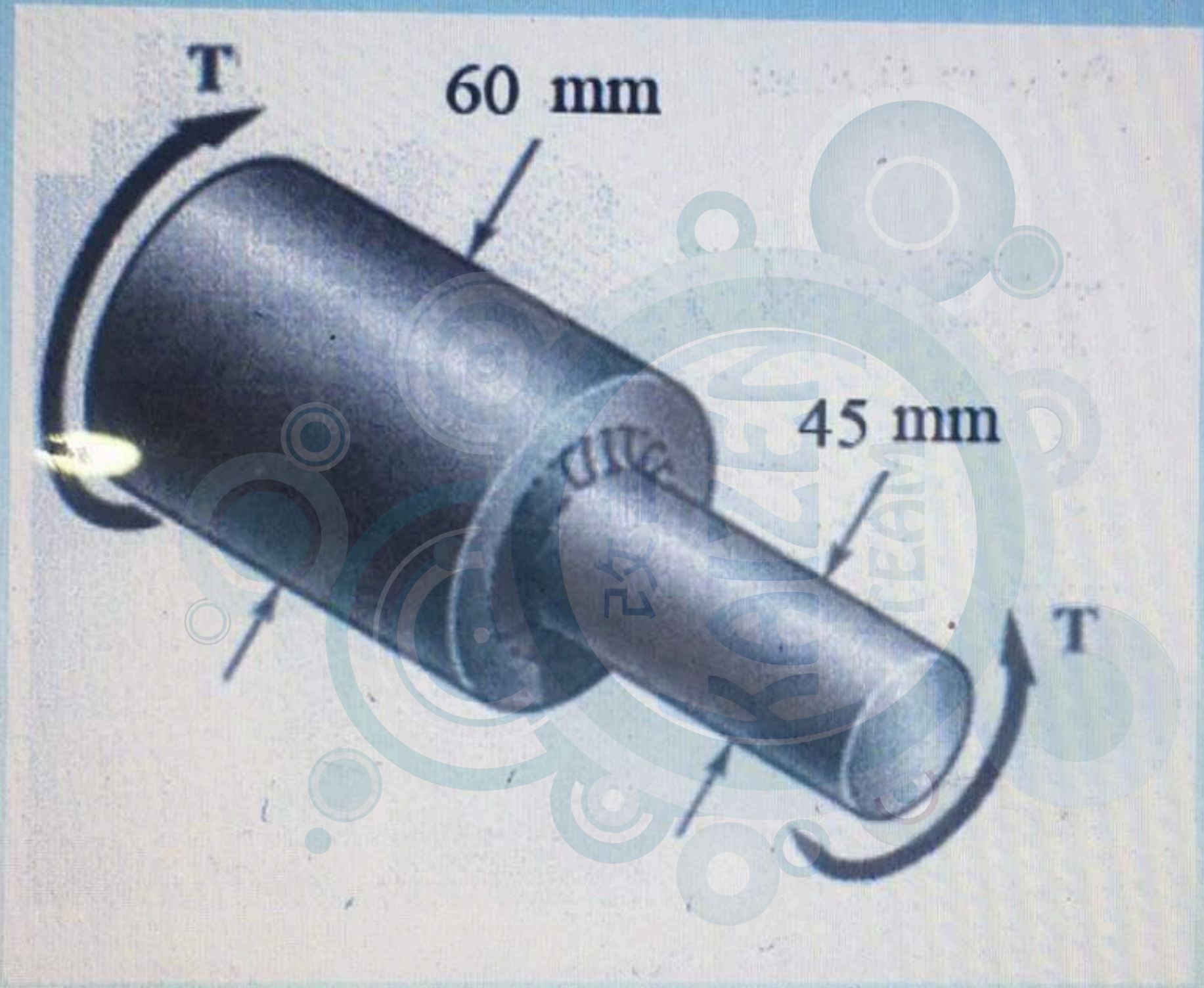
Question 16

Answer saved

Marked out of 3.00

Flag question

Knowing that at stepped shafts transmits 40 kW at a speed of 800 rpm. Determine the minimum radius r of the fillet if the maximum shear stress developed is 40 MPa. D/d=60/45



Answer: 2.8125

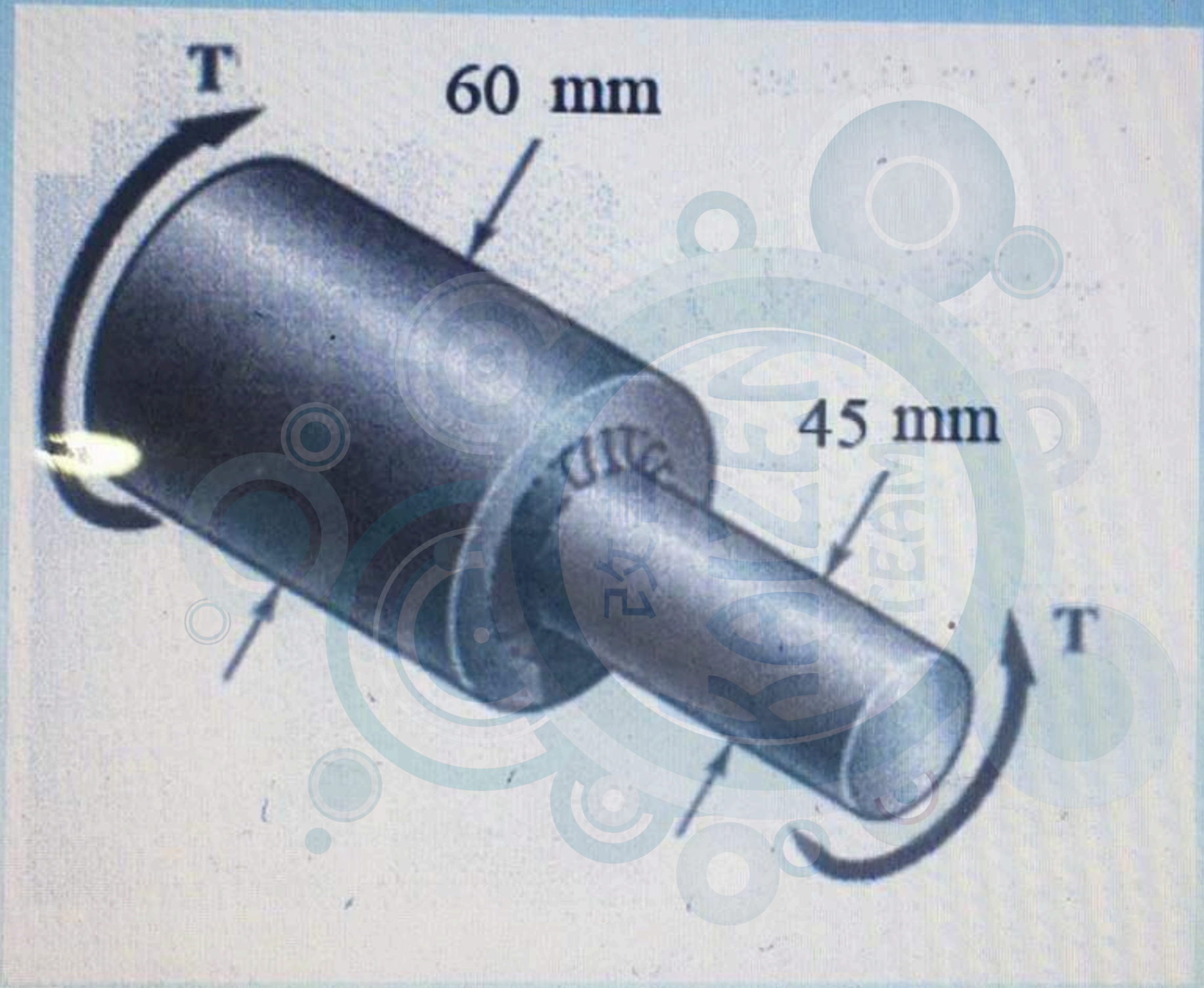
Question 16

Answer saved

Marked out of 3.00

Flag question

Knowing that at stepped shafts transmits 40 kW at a speed of 800 rpm. Determine the minimum radius r of the fillet if the maximum shear stress developed is 40 MPa. D/d=60/45



Answer: 2.8125

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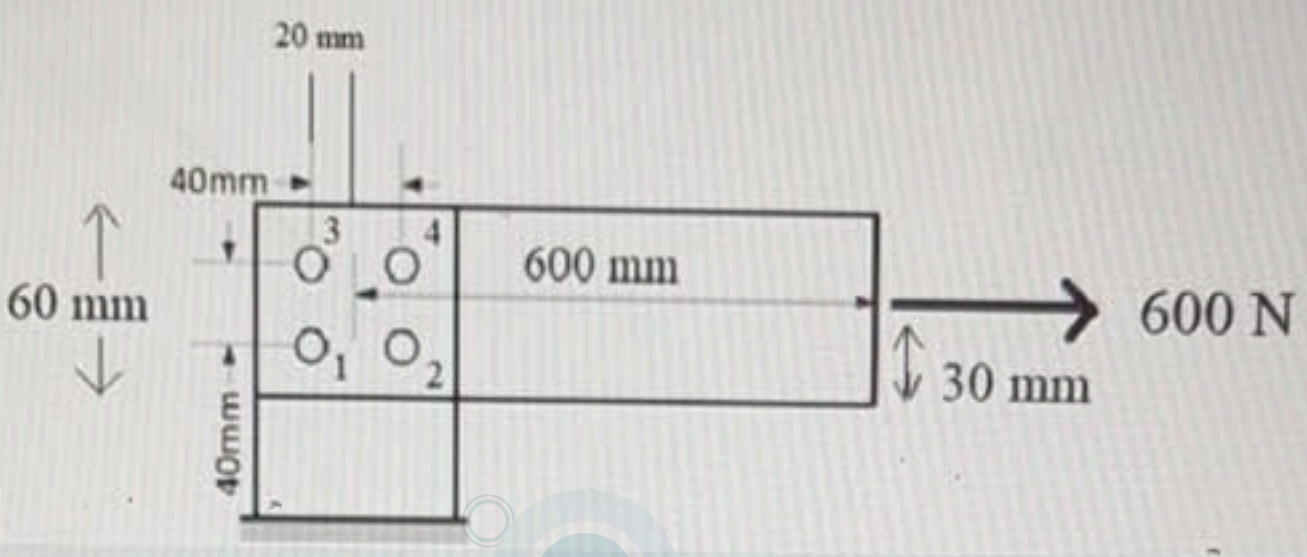
Question 1

Not yet answered

Marked out of 3.00

Flag question

A horizontal plate has been joined to a vertical post using four M10×1. 5 bolts arranged as The threaded portion of the fastener is passing through the shear interface. What is the r developed in the joint



a. 4.19 MPa

b. 5.41 MPa

c. 2.64 MPa

d. 6.23 MPa

e.

Clear my choice

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uestion 7
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Flag
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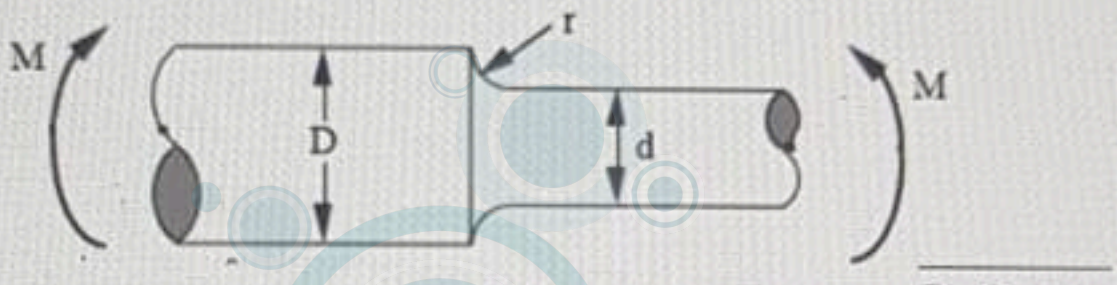
A shoulder with the given dimensions is loaded with bending. All surfaces are machined of AISI 1030 HR steel. Find the actual endurance limit.

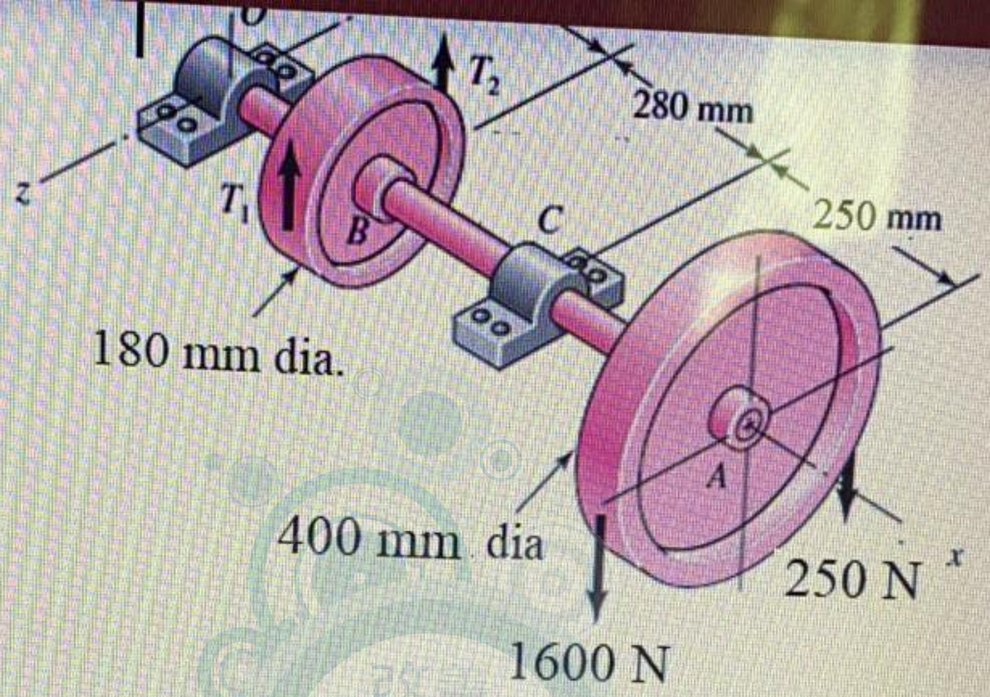


D = 36 mm
d = 30 mm
r = 3 mm

- a. 198.11 MPa
- b. 208.13 MPa
- c. 229.07 MPa
- d. 243.82 MPa
- e. 253 MPa

Clear my choice

here to search



- a. -3435.28 N
- b. -3544.1 N
- c. -3362.72 N
- d. -3181.3 N
- e. None of the values is correct

Clear my choice

IUFACTURING ENGINEERING LABORATORY

Attempts allowed: 1

Time limit: 15 mins

Attempt quiz now

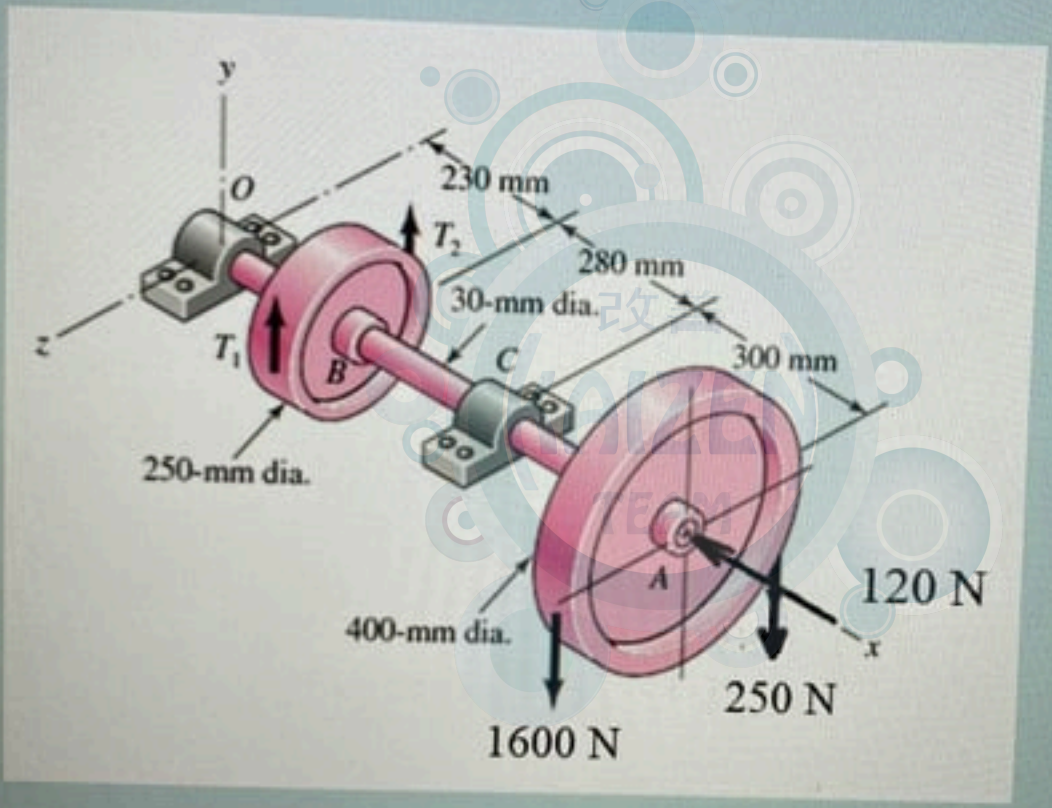
Question 12

Not yet answered

Marked out of 3.00

Flag question

what is the Reaction at O in the Y direction if the belt tension on the loose side at *B* is 16 percent of the tension on the tight side.:



Answer:

Next page

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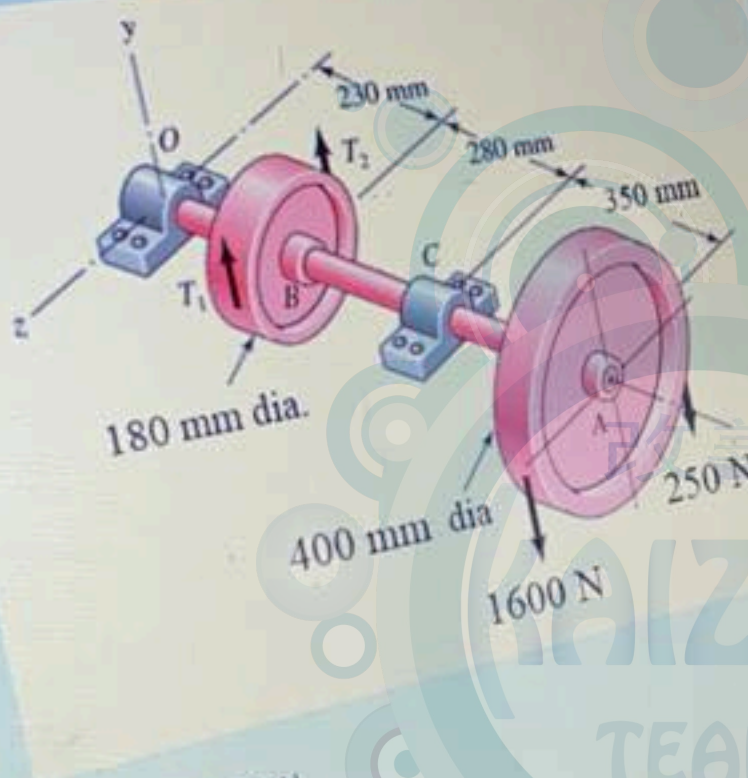
Time left 0:55:42

A belt-driven jack-shaft is shown in the figure below. The belt tension on the loose side at B is 16 percent of the tension on the tight side.

Determine the reaction at point O direction y



a. -3362.73 N

b. -3181.3 N

c. -3435.28 N

d. -3544.1 N

e. none of the values is correct

Finish attempt ...

DELL

Clear my choice

Question 11

Answer saved

Marked out of 4.00

Flag question

A part rotates, and in each rotation stress varies from σ_{max}=20,000 psi to σ_{min}=1,000 psi. Th material has UTS= 80,000 psi, Sy = 60,000 psi, Se=28,000 psi. Assume Kf=1.2 Find the fatgue f of safety according to the modified Goodman's equations

Select one:

- a. 2.12
- b. 1.94
- c. 2
- d. 1.77

Clear my choice

Question 12

Answer saved

What are the requirements of material for a shaft

Question 9

Not yet answered

Marked out of 3.00

Flag question

For a given loading condition and material, the fatigue factor of safety is determined to be 1. What would happen to the fatigue factor of safety if the only thing changed was an increase in the endurance limit?

Select one:

a. the fatigue factor of safety will increase

b. the fatigue factor of safety will decrease

c. cannot be determined

d. the fatigue factor of safety will stay the same

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Next page

News forum

Jump to...

Question 1

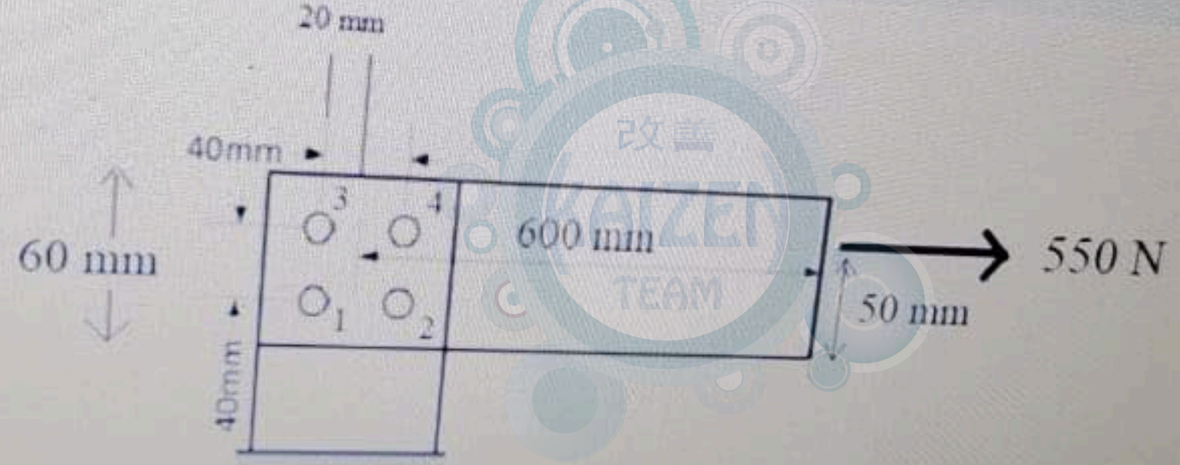
Not yet answered

Marked out of 4.00

Flag question

Time left 0:54:50

A horizontal plate has been joined to a vertical post using four bolts arranged as shown in the figure. What is the magnitude of the maximum load (in N) on bolt 1. **Round to one decimal**. JUST WRIGHT THE VALUE



Answer:

Quiz navigat

1 2 3 4

8 9 10 11

15 16 17 18

Finish attempt ...

Question 1

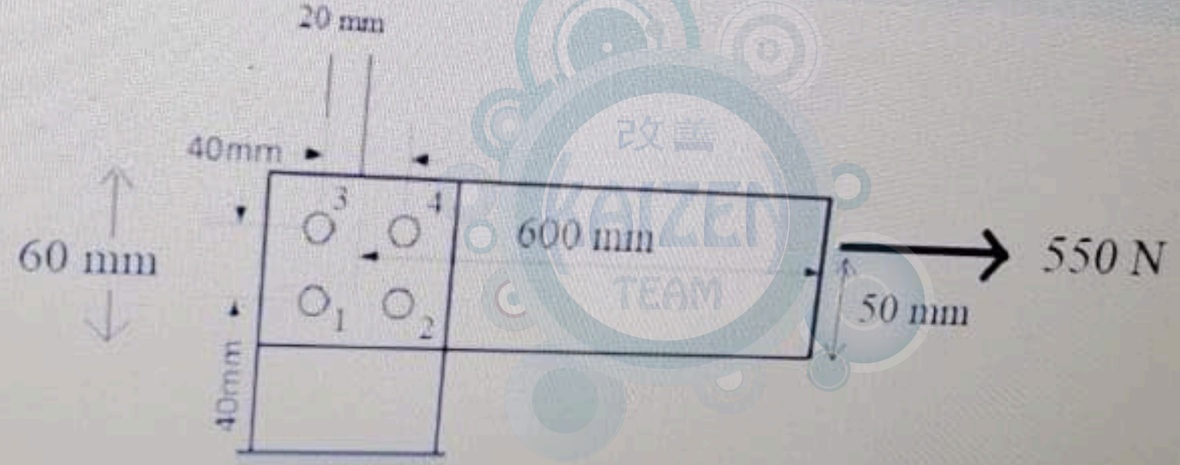
Not yet answered

Marked out of 4.00

Flag question

Time left 0:54:50

A horizontal plate has been joined to a vertical post using four bolts arranged as shown in the figure. What is the magnitude of the maximum load (in N) on bolt 1. **Round to one decimal**. JUST WRIGHT THE VALUE



Answer:

Quiz navigat

1 2 3 4

8 9 10 11

15 16 17 18

Finish attempt ...

A power screw made from steel and the nut is made from Bronze. Machine oil is used as lubrication between the screw and nut. In order to have self locking the lead angle λ (depending on the value of f) can be :

- a. less than 5.71 only
- b. less than 3.43or between 3.43 and 5.14
- c. less than 5.71 or between 5.71 and 9.09
- d. higher than 9.09
- e. less than 6.28 or between 6.28 and 9.65

Two tapered bearing are to have a life of 60 kh at a combined reliability of 0.98. if the shaft rotates with a speed of 320 rev/min calculate the dimensionless life of the bearing X_D

- a. 18
- b. 12.8
- c. 16
- d. 12
- e. 24

Next page

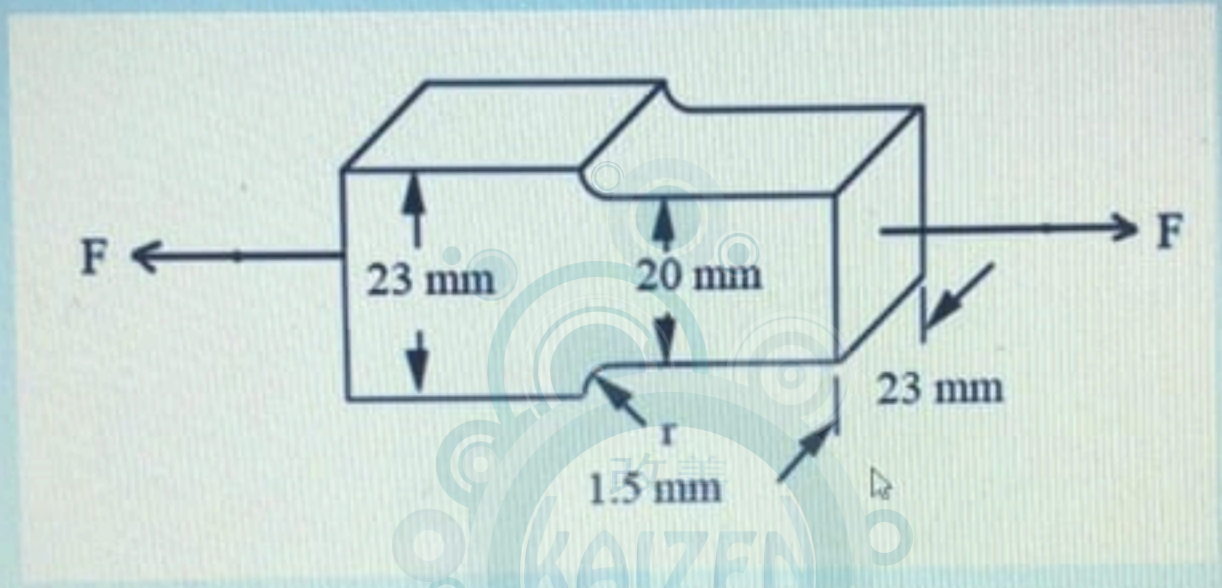
Question 6

Not yet answered

Marked out of 6.00

Flag question

A shoulder with the given dimensions is loaded with a completely reversed axial force having a maximum value of 10 kN and minimum value of -10 kN. If the UTS for the material is 700 MPa and the actual endurance limit Se= 236 MPa. Find the fatigue factor of safety according to the modified Goodman criteria.



- a. none of them is correct
- b. 4.3
- c. 4.6
- d. 6.5
- e. 1.2

uestion 13

ot yet
nswered

Marked out of
3.00

Flag
question

In the thread Specification 1/4-28UNF-2A, the fraction 1/4 represents the

a. Pitch is 1/4 in

b. Class of fit is 1/4

c. Threaded length is 1/4 in

d. Major Diameter is 1/4 in

e. Minor Diameter is 1/4 in

Time left 0:24:29

Question 3

Not yet answered

Marked out of 4.00

Flag question

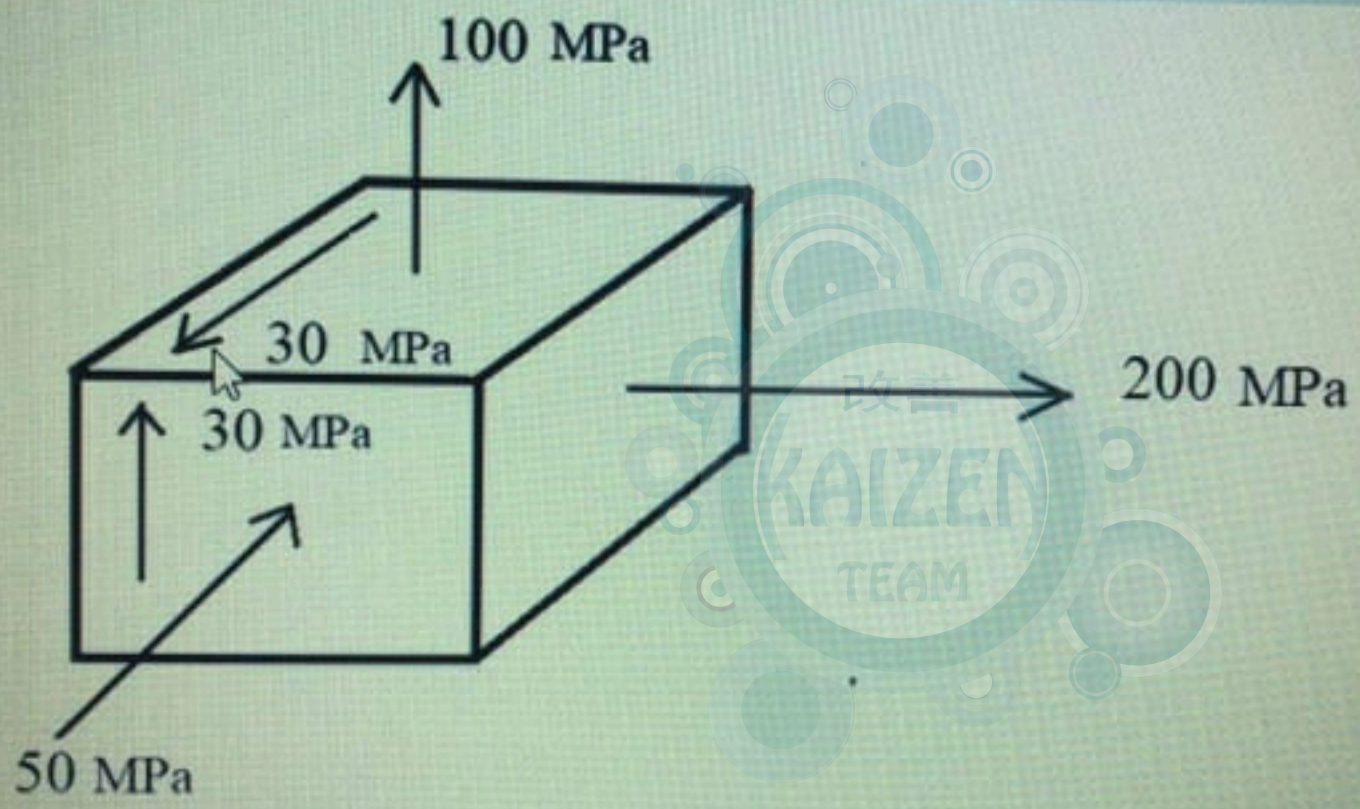
A single square-thread power has a diameter of 40 mm and a pitch of 8 mm. The frictional coefficients are 0.14 for the threads and 0.08 for the collar, with a collar diameter of 100 mm. If the raising Torque is 577 N.m what is the load F.

- a. 73.68 kN
- b. 60.91 kN
- c. 56.72 kN
- d. 63.77 kN
- e. 57.3 kN

Next page

Time left 0:20:37

Calculate the factor of safety for the following stress state according to Von Mises. If the part is made from AISI 1020 CD.



Answer:

Time left 0:33:52

Question 2

Not yet answered

Marked out of 3.00

Flag question

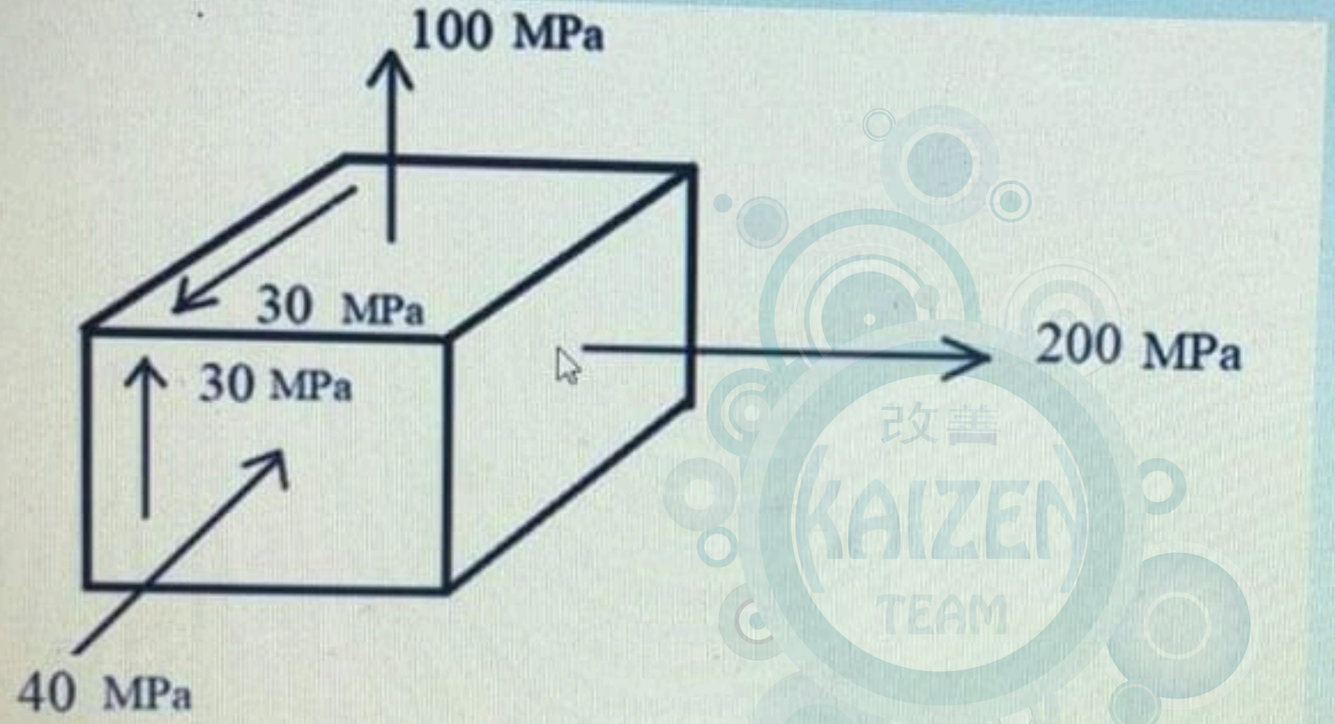
Two tapered bearing are to have a life of 90 kh at a combined reliability of 0.98. if the shaft rotates with a speed of 400 rev/min calculate the dimensionless life of the bearing X_D

- a. 12
- b. 14
- c. 24
- d. 16
- e. 18

Next page

Time left 0:30:02

Calculate the factor of safety for the following stress state according to Von Mises. If the part is made from AISI 1015 CD. Write your final answer without units and rounded to two decimal places



Answer:

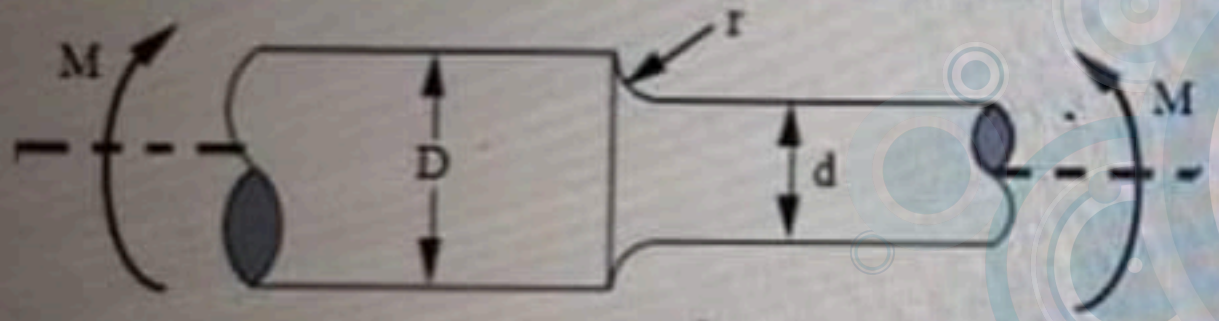
Next page

Time left 0:19:16

A shaft having a shoulder is loaded with bending stresses such that the following stresses are created at a particular location: Bending: Fluctuating stress from −68 MPa to 200 MPa

The steel from which it is manufactured has a yield strength of 480 MPa . The notch sensitivity factor for bending is Kf= 1.6

What is the yielding facor of saftey



Answer:

Next page

INEERING DESIGN

Time left 0:47:29

. If a part is loaded with stress components in all directions how will you now if the part will fail or not

Answer: geometry of the structure

Next page

in touch

Time left 0:14:08

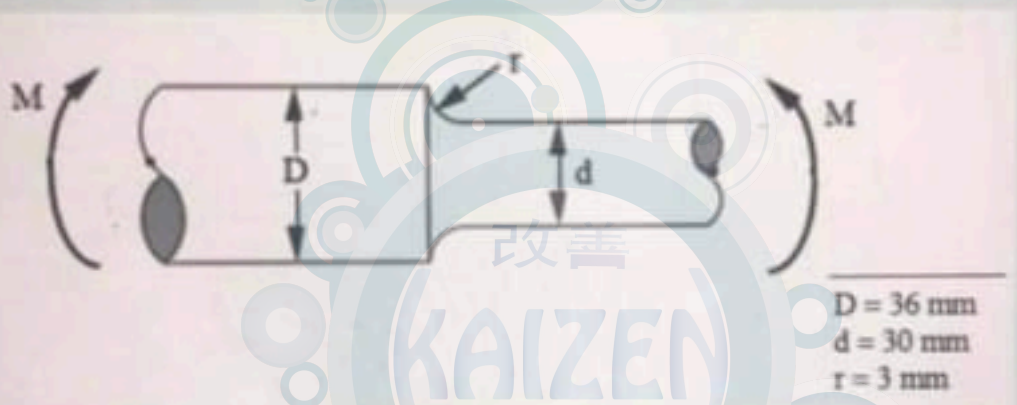
A shaft is made of AISI 1035 HR. The measured endurance limit, Se is 220 MPa. The amplitude of the bending moment is Ma=700N.m and the mean for torsion is Tm=300N.m

The notch sensitivity factors are :

Kf= 3 and Kfs =2.6 . Use a fatique factor of safety nf= 3. Find the diameter of the shaft

- a. 68.71 mm
- b. 70 mm
- c. 69.31 mm
- d. none of the values is correct
- e. 79.1 mm

A shoulder with the given dimensions is loaded with bending. All surfaces are machined and shoulder is made of AISI 1035 HR steel. Find the actual endurance limit.

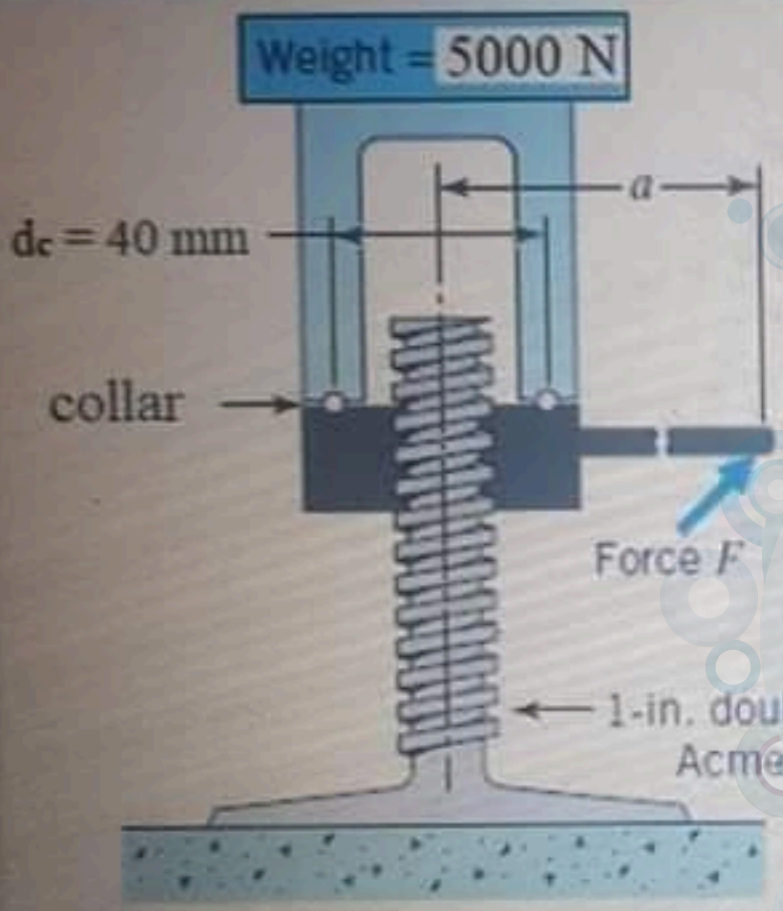


D = 36 mm
d = 30 mm
r = 3 mm

- a. 198.11 MPa
- b. 229.07 MPa
- c. 208.13 MPa
- d. 243.82 MPa
- e. 310 MPa

Time left 0:56:20

A screw jack with a 1 in double thread ACME screw is used to raise a load of 7000 N. The screw material is steel and the nut material is Bronze also Oil lubrication is used. The collar friction coefficient is fc= 0.12 and dc= 40 mm. Estimate the torque for raising the load



a. 27.94 N.m

b. 33.52 N.m

c. 57.34 N.m

d. 39.11 N.m

e. none of the values is correct

Time left 0:07:29

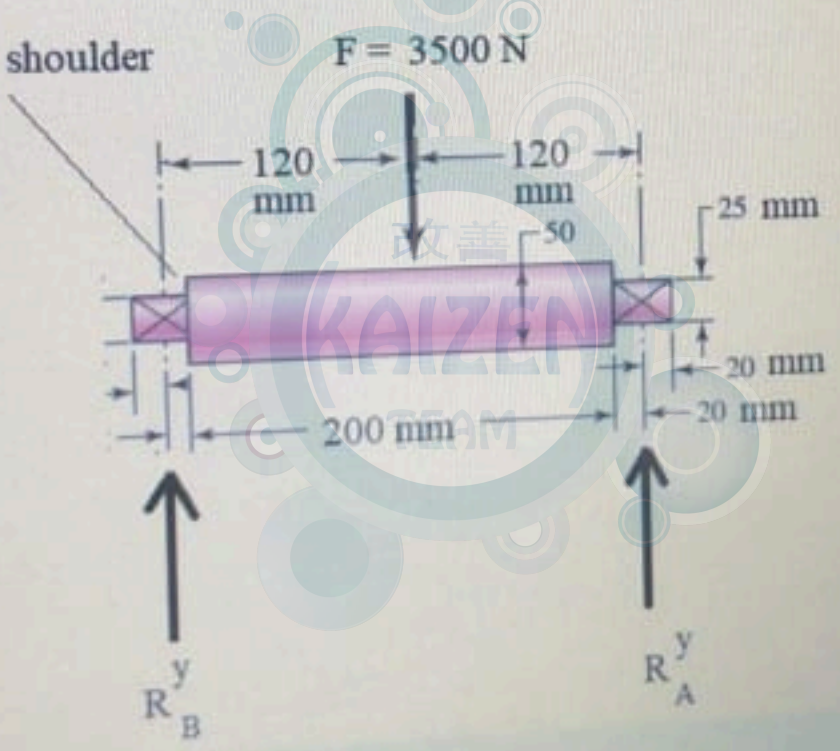
Question 10

Not yet answered

Marked out of 5.00

Flag question

A shaft is loaded with a force F= 3500 N at the middle of the shaft. If the F force is cycled from max 3500 to min -3500 N what is the Fatigue factor of safety according to modified Goodman criteria at the shoulder. Use Se = 190 MPa. and Kf = 2.3 at the shoulder



Answer:

Quiz navigati

1 2 3 4

9 10 11 12

Finish attempt ...

Question 8

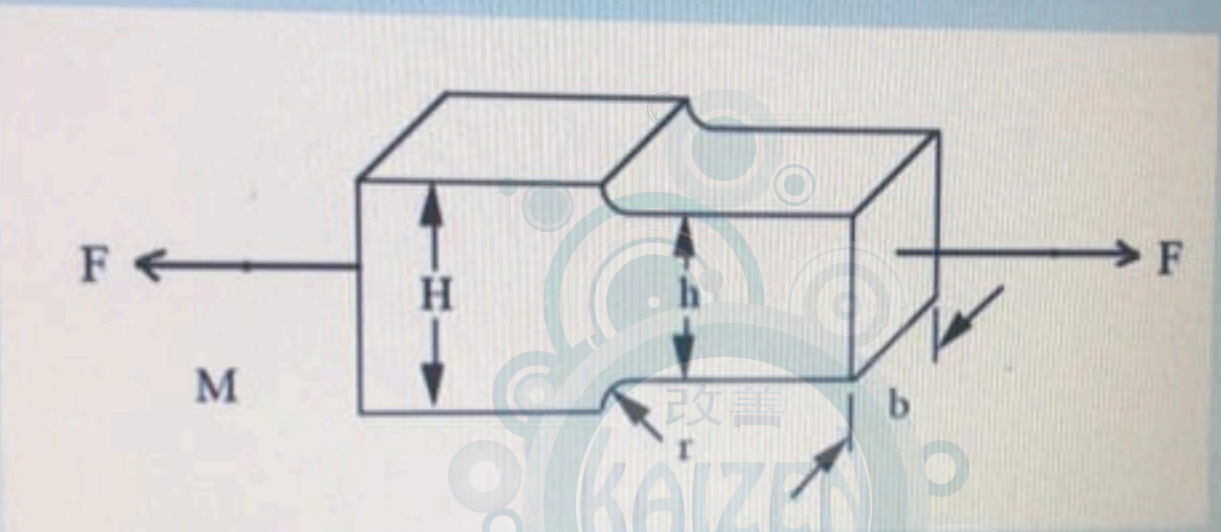
Not yet answered

Marked out of 4.00

Flag question

Time left 0:10:23

A shoulder is loaded with axial force. All surfaces are machined and shoulder is made of AISI 1035 HR steel. Find the actual endurance limit.



- a. 250 MPa
- b. 189 MPa
- c. 160 MPa
- d. none of them is correct
- e. 184.6 MPa
- f. 300 MPa

Quiz no

1 2 9 10

Finish atte

Time left 0:14:30

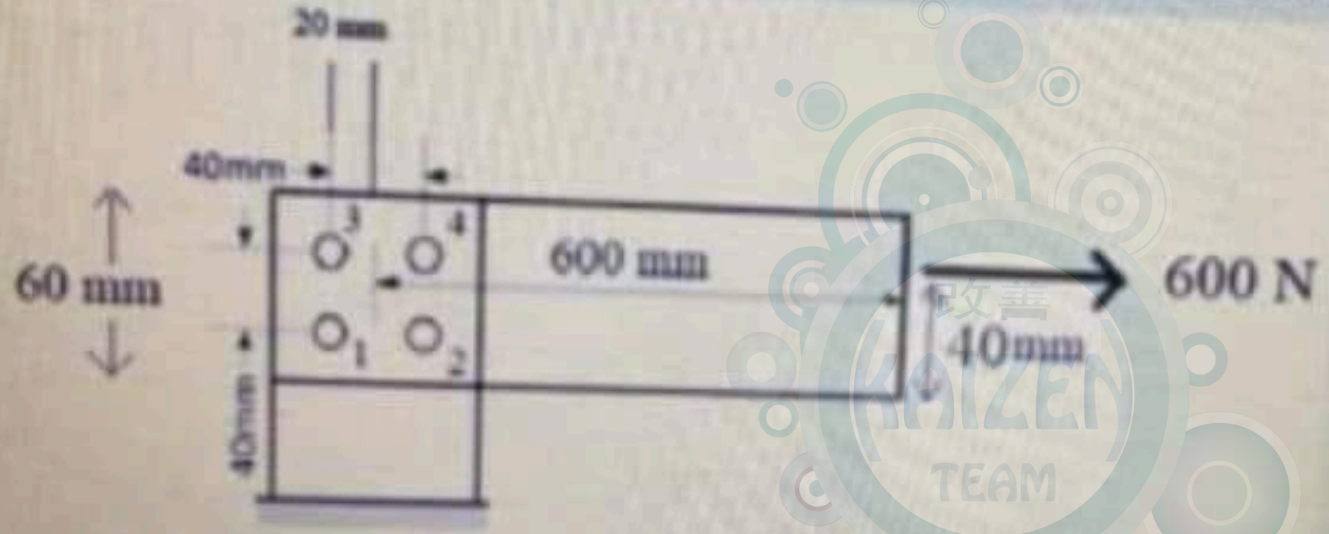
. If a part is loaded with stress components in all directions how will you now if the part will fail or not

Answer:

Next page

Time left 0:53:58

A horizontal plate has been joined to a vertical post using four bolts arranged as shown in the figure. What is the magnitude of the maximum load (in N) on bolt 1. **Round to one decimal**. JUST WRIGHT THE VALUE



Answer: 335.5

Next page

Quiz

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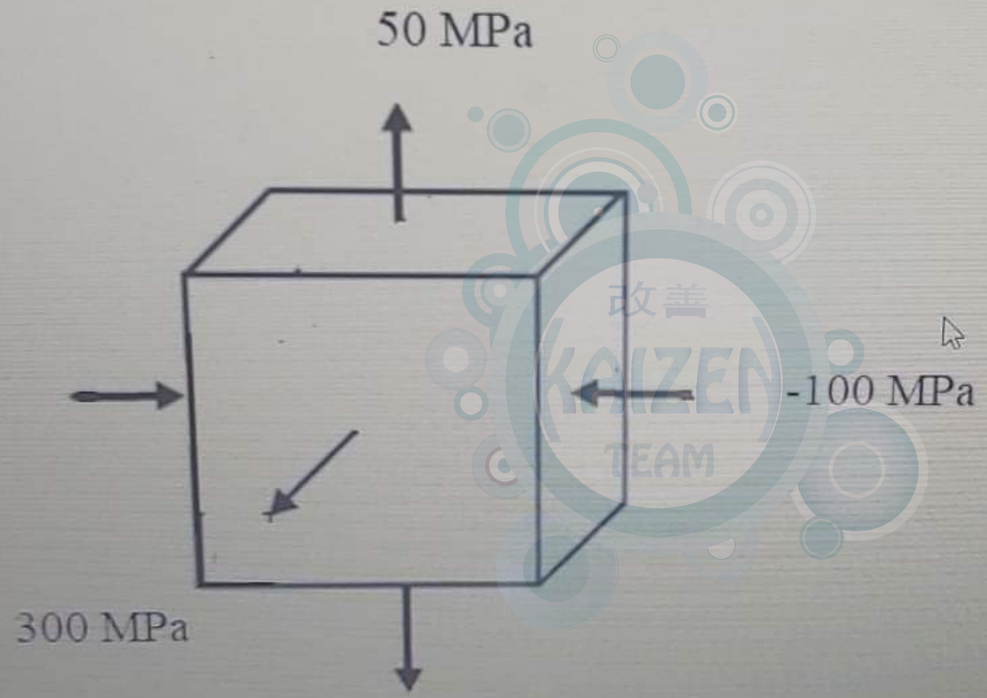
Question 13

Not yet answered

Marked out of 2.00

Flag question

The state of stress is shown in the figure below. If the yield strength of the material is 535.5 MPa using Von-mises yielding criteria determine if the material will yield or not and what is the factor of safety



a. Yielding will not occur, and the factor of safety is 2.5

Time left 0:13:07

Question 10

Not yet answered

Marked out of 2.00

Flag question

A machine element is subjected to the following bi-axial state of stress: $\sigma x=100$ MPa; $\sigma y=25$ MPa; $\tau xy=40$ MPa. If the yield strength of the material is 200 MPa, the factor of safety according to Tresca's maximum shear stress theory is

- a. 2
- b. 3
- c. none of the answers is correct
- d. 1.82
- e. 2.32

Next page

Time left 0:12:06

Question 11

Not yet answered

Marked out of 5.00

Flag question

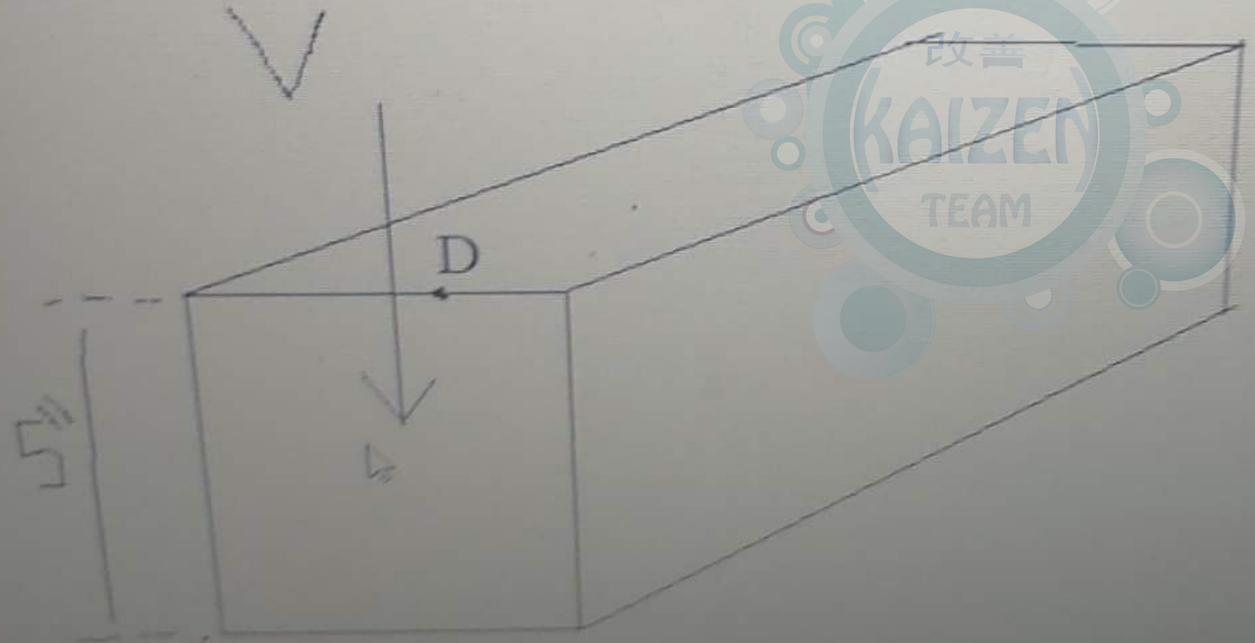
The figure shows the free-body diagram of a machine part. The dimensions are

r = 1.25 mm, H = 27.5 mm h = 25 mm b = 20 mm. Calculate the maximum normal stress due to the stress concentration. **Write your answer rounded to 1 decimal place without units**

Answer:

Time left

the beam is subjected to a vertical shear force V= 3 kip. Determine the shear stress at point D.



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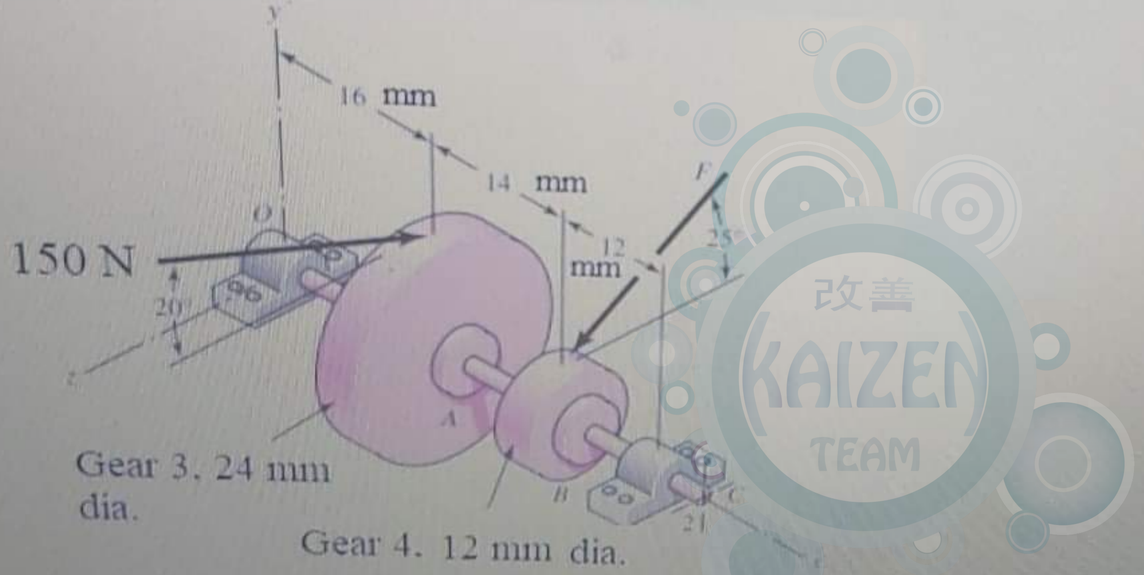
question

Time left 0:30:03

A gear-reduction unit uses the countershaft depicted in the figure. Find the reaction at point C in the direction y.

Write your final answer rounded to 2 decimal places without units



Answer:

Finis

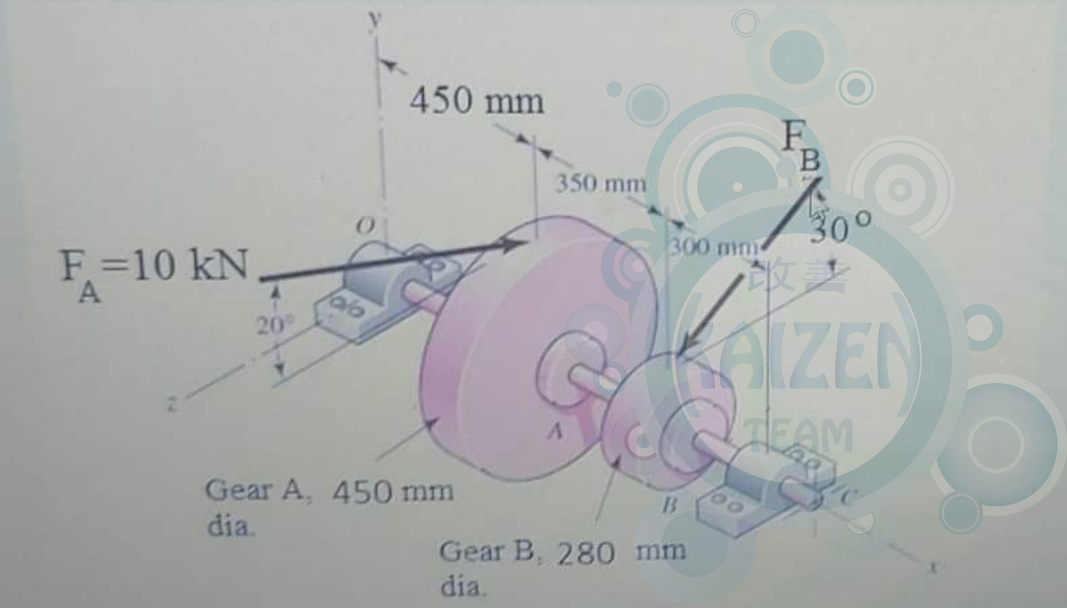
Question 9

Not yet answered

Marked out of 2.00

Flag question

The shaft shown in the figure is driven by a motor at 120 rpm. The reactions at O and C are R_O= 4.63 kN and R_C= 10.53 kN. If the desired life for each bearing is 900 h with a 98 percent reliability. Two angular contact ball bearings at O and C are to be used. Using an application factor of unity calculate C10



a. 28.2 kN

b. 31.46 kN

c. 26.09 kN

d. 32.15 kN

1 2 9 10

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on

The state of plane stress at a point is represented by the stress element below. Find the principal angle for the minimum stress:

(the angle between the x axis and the plane having the minimum stress)

$$\begin{pmatrix} 85 & 18 \\ 18 & -45 \end{pmatrix}$$

- a. 97.74°
- b. 100.52°

Question 5

Not yet answered

Marked out of 2.00

Flag question

Find the maximum shear stress for the following state of stress condition that exists in an element

$\sigma xx = -80$ MPa $\sigma yy = 0$ $\sigma zz = 40$ MPa $\tau xy = 10$ MPa

$\tau xz = 0$ $\tau yz = 10$

$$\begin{Bmatrix} -80 & 10 & 0 \\ 10 & 0 & 10 \\ 0 & 10 & 40 \end{Bmatrix} \text{MPa}$$

- a. none of them is correct
- b. 48.63 MPa
- c. 66.83 MPa
- d. 61.82 MPa

Time left 0:21:33

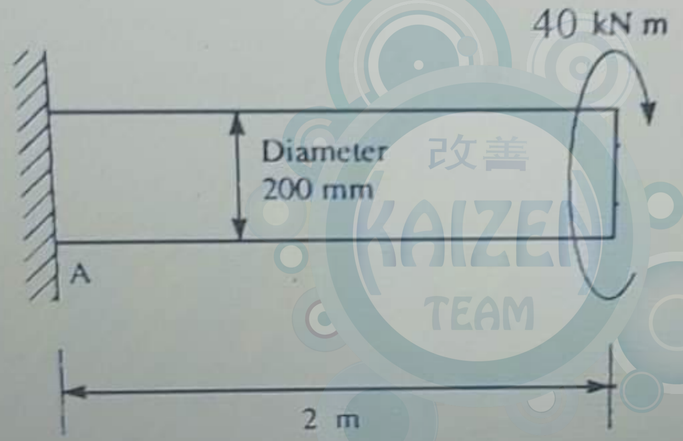
Question 8

Not yet answered

Marked out of 2.00

Flag question

A bar of circular cross-section is 2 m long its diameter is 200 mm. If the bar is firmly supported at its ends and subjected to a torque of 40 kN.m. Calculate the maximum shear stress in the bar.



- a. 24 MPa
- b. 12.73 Pa
- c. 12.73 MPa
- d. none of the values is correct