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MECHANICAL ENGINEERING

Practice Set for Each Topic with solution

PRACTICE BOOK

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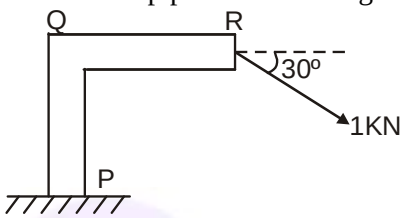
1. ENGINEERING MECHANICS

1. In projectile motion the velocity
(a.) Is always perpendicular to the acceleration
(b.) Is never perpendicular to the acceleration
(c.) Is perpendicular to[1] acceleration for one instant only
(d.) Is perpendicular to acceleration for two instants

2. A projectile is fired with a sped u at an angle θ with the horizontal. What is its speed when its direction of mot ion makes an angle α with the horizontal?
(a.) u cos θ (b.) u cos α
(c.) u cos θ cos α (d.) u cosθ sec α

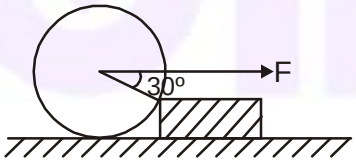
3. If the maximum and minimum resultant forces of two forces acting on a particle are 40kN and 10kN respectively, then the two forces are
(a.) 25kN and 15kN (b.) 20kN and 20kN
(c.) 20kN and 10kN (d.) 20kN and 5kN

4. What is the axial thrust at point P in lamp post shown in figure?



(a.) 0.866kN (b.) 0.5kN (c.) 1.388kN (d.) 1kN

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



(a.) $\frac{W}{2}$ (b.) W (c.) $\sqrt{3}W$ (d.) 2W

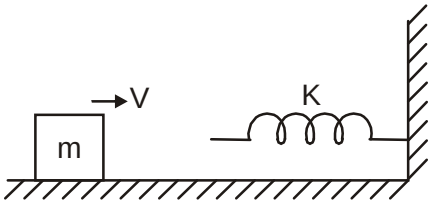
6. A car of mass 1000kg is travelling at constant speed of 50m/s. The car has to resist a wind drag $F_D = 10V(N)$, where V is the velocity of car in m/s. the power required by the engine is
(a.) 5kW (b.) 10kW (c.) 25kW (d.) 50kW

7. A block of mass m is placed on a smooth inclined plane of inclination θ with horizontal. The force exerted by the plane on the block has a magnitude
(a.) mg (b.) mg/ cosθ (c.) mg cos θ (d.) mg tan θ

8. A block of mass 'm' is kept on a horizontal table. If the static friction coefficient is 'μ', the frictional force acting on the block is
(a.) Zero (b.) mg (c) μ mg (d.) Data not sufficient

9. A block placed on a horizontal surface is being pushed by a force F making an angle θ with the vertical. If coefficient of friction is μ, how much force is required to get the block just started?
(a.) μmg cos (b.) μmg sin
(c.) $\frac{\mu mg}{\sin\theta + \cos}$ (d.) $\frac{\mu mg}{\sin\theta - \cos}$

10. When the mass 'm' with velocity 'V' hits the spring as shown in figure, the maximum compression of the spring is



(a.) $V\sqrt{\frac{m}{k}}$ (b.) $\frac{V}{2}\sqrt{\frac{m}{k}}$ (c.) $V\sqrt{\frac{2m}{k}}$ (d.) $V\sqrt{\frac{m}{2k}}$

11. The centre of a wheel rolling on a plane surface moves with speed V. A particle on the rim of the wheel at the same level as centre will be moving at speed

(a.) Zero (b.) V (c.) $\sqrt{2V}$ (d.) 2V

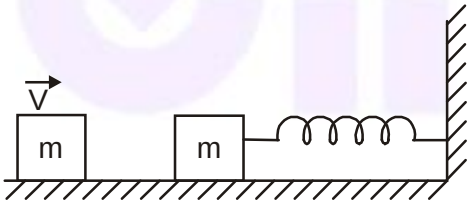
12. A person, carrying on his head a jewellery box of weight 'W' jumped down from the third storey of a building. Before touching the ground, he would feel a load of magnitude

(a.) Zero (b.) $\frac{W}{2}$ (c.) W (d.) Infinity

13. A particle is kept at rest at a distance R (earth's radius) above the earth's surface. The minimum speed with which it should be projected so that it does not return is (M = Earth's mass)

(a.) $\sqrt{\frac{GM}{4R}}$ (b.) $\sqrt{\frac{GM}{4R}}$ (c.) $\sqrt{\frac{GM}{R}}$ (d.) $\sqrt{\frac{2GM}{R}}$

14. Block shown in figure collides in elastically with the right block and sticks to it. The amplitude of resulting SHM is

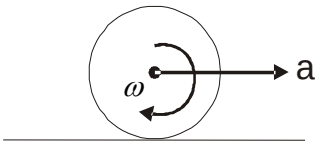


(a.) $\sqrt{\frac{m}{2k}}.V$ (b.) $\sqrt{\frac{m}{k}}.V$ (c.) $\sqrt{\frac{2m}{k}}.V$ (d.) $\sqrt{\frac{m}{3k}}.V$

15. The average acceleration in one time period in a SHM is (A = amplitude, w= angular acceleration)

(a.) Aw^2 (b.) $\frac{Aw^2}{2}$ (c.) $\frac{Aw^2}{\sqrt{2}}$ (d.) Zero

16. A ring of radius R rolls on a horizontal surface with constant acceleration of the centre of mass. If ω is the instantaneous angular velocity of the ring then the net acceleration of the point of the ring with ground is



(a.) Zero (b.) ω^2 R (c.) a (d.) $\sqrt{a^2+(\omega^2 R)^2}$

17. The maximum load that a wire can sustain is W. If the wire is cut to half to its value, the maximum load it ease sustain is

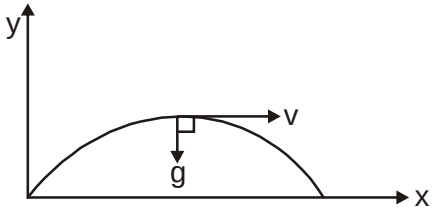
(a.) W (b.) $\frac{W}{2}$ (c.) $\frac{W}{4}$ (d.) 2W

Answer: Engineering Mechanics Level – I

1. **ANS:** c

EXP:

When the particle is at height point acceleration is perpendicular to velocity



2. **ANS:** d

EXP:

As the horizontal component of velocity remains constant,

$\therefore V\cos\alpha = u\cos\theta$

$or, V = u\cos\theta\sec\alpha$

3. **ANS:** a

EXP:

$R^2 = P^2 + Q^2 + 2PQ\cos\theta$

$\therefore R_{max}^2 = P^2 + Q^2 + 2PQ = (P+Q) = 40^2 \quad ...(i)$

$R_{min}^2 = P^2 + Q^2 - 2PQ = (P-Q)^2 = 10^2 \quad ...(ii)$

Solving (i) and (ii), we get

P = 25kN and Q = 15kN

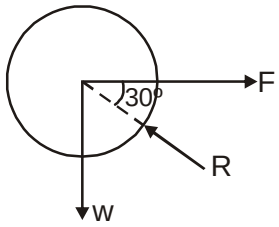
4. **ANS:** b

EXP:

Axial thrust = vertical component of force = (1kN) (sin 30º) = 0.5kN

5. **ANS:** c

EXP:



R sin 30º = W

$or, \quad R \times \frac{1}{2} = w$

$or, \quad R = 2w$

$Also, F = R\cos 30^o = 2w \times \frac{\sqrt{3}}{2} = \sqrt{3}w$

6. **ANS:** c

EXP:

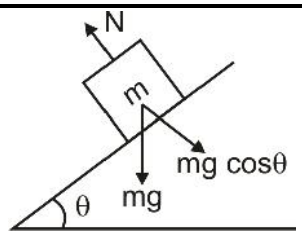
Power required is to overcome drag only

$P = F_D \times V = 10V^2 = 10(50)^2 w = 25000w = 25kw$

7. **ANS:** c

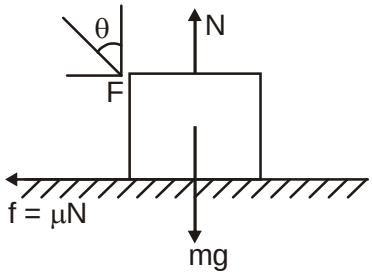
EXP:

N = mg cos θ



8. **ANS:** a
EXP:
Since no force is applied on the block. Hence frictional force is zero

9. **ANS:** d
EXP:



For horizontal equilibrium
F sin θ = μN ... (i)
For vertical equilibrium
F cos mg + = N ... (ii)
From (i) and (ii)

$$F\sin\theta = \mu\cos\theta + \mu mg$$

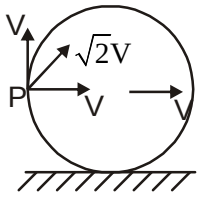
$$\therefore \qquad F = \frac{\mu mg}{\sin\theta - \mu\cos\theta}$$

10. **ANS:** a
EXP:
Change in K.E. of block = gain in Elastic P.E of spring

$$\frac{1}{2}mv^2 = \frac{1}{2}kx_{max}^2 \ (x_{max} = \text{maximum compression of spring})$$

$$\therefore x_{max} = V\sqrt{\frac{m}{k}}$$

11. **ANS:** c
EXP:



Speed on point P

$$V_P = \sqrt{V^2 + V^2} = \sqrt{2}V$$

12. **ANS:** a
13. **ANS:** c
EXP:
From conservation of energy,

$$\frac{1}{2}mv^2 - \frac{GMm}{R+R} \geq 0, (m = mass\ of\ particle)$$

$$\frac{1}{2}mv^2 \geq \frac{GMm}{2R}$$

$$\therefore \quad V_{\min} = \sqrt{\frac{GM}{R}}$$

14. **ANS:** a

From conservation of momentum, common velocity after collision $= \frac{V}{2}$

From conservation of energy,

$$\frac{1}{2}(2m)\left(\frac{V}{2}\right)^2 = \frac{1}{2}KA^2 (A = Amplitude\ of\ SHM)$$

$$or, \frac{1}{4}mv^2 = \frac{1}{2}KA^2$$

$$\therefore \quad A = \sqrt{\frac{m}{2k}}.V$$

15. **ANS:** d

EXP:

Average acceleration in one time period in a SHM is zero

16. **ANS:** b

EXP:

At point of contact there is no slipping, so net acceleration = $\omega^2 R$

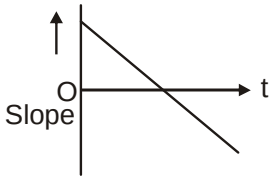
17. **ANS:** a

1. Equation of projective for a particle is $y = px - qx^2$, the initial speed of the particle at origin is (g = acceleration due to gravity)

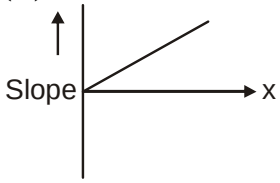
(a.) $\sqrt{\frac{g(1+p^2)}{2q}}$ (b.) $\sqrt{\frac{2g(1+p^2)}{q}}$ (c.) $\sqrt{\frac{2gp^2}{q}}$ (d.) $\sqrt{\frac{gp^2}{q}}$

2. A heavy particle is projected with a velocity at an angle with the horizontal into uniform gravitational field. The slope of the trajectory of the particle

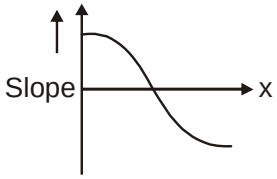
(a.)



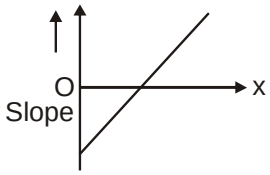
(b.)



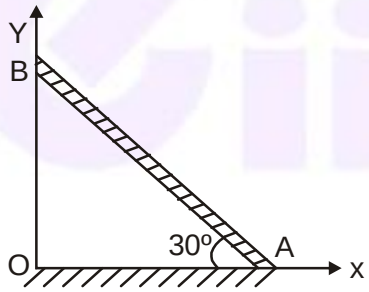
(c.)



(d.)

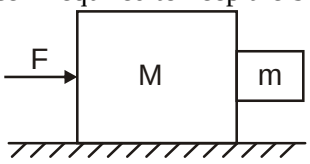


3. A rod AB rests with the end A on rough horizontal ground and end B against a vertical wall as shown in figure. The rod is uniform and weight W. The normal reaction at B when the rod is in equilibrium is



(a.) W (b.) $\frac{W}{2}$ (c.) $\frac{\sqrt{3}W}{2}$ (d.) $\sqrt{3}W$

4. In the given figure, the coefficient of friction between wedge of mass M and block of mass m is μ. The minimum horizontal force F required to keep the block stationary with respect to wedge



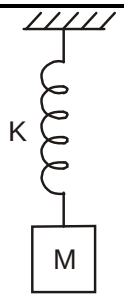
(a.) (M + m)g (b.) μ (M + m)g

(c.) $(M+m)\frac{g}{\mu}$ (d.) zero

5. A block of mass 'm' slides down a smooth vertical circular track, during the motion, the block is in

(a.) Vertical equilibrium (b.) Horizontal equilibrium
(c.) Radial equilibrium (d.) none of these

6. An ideal spring mass system shown below, the maximum extension of the spring is (g = acceleration)

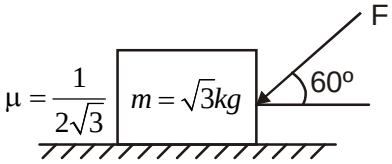


(a.) $\frac{Mg}{k}$ (b.) $\frac{2Mg}{k}$ (c.) $\frac{4Mg}{k}$ (d.) $\frac{Mg}{2k}$

7. A body is moved along a straight line by a machine delivering constant power. The distance moved by the body in time t is proportional to

(a.) $t^{\frac{1}{2}}$ (b.) $t^{\frac{3}{4}}$ (c.) $t^{\frac{3}{2}}$ (d.) t^2

8. What is the maximum value off force F such that the block shown in the arrangement does not move?



(a.) 20N (b.) 10N (c.) 12N (d.) 15N

9. If the radius of the earth were to shrink by one percent, its mass remaining the same, the acceleration due to gravity on the earth's surface would:

(a.) Decrease (b.) Remain unchanged
(c.) Increase (d.) None of these

10. Two particles A and b, initially at rest move towards each other under mutual force of attraction. At the instant when the speed of A is V and speed of B is 2V, the speed of centre of mass of the system is;

(a.) 3V (b.) V (c.) 1.5V (d.) zero

11. A solid sphere of radius 'r' is gently placed on a rough horizontal ground with an initial angular sped ω_o, and no linear velocity. If the coefficient of friction is μ, the time 't' when the slipping stops is

(a.) $\frac{r\omega_o}{\mu g}$ (b.) $\frac{2}{7}\frac{r\omega_o}{\mu g}$ (c.) $\frac{1}{7}\frac{r\omega_o}{\mu g}$ (d.) $\frac{2}{5}\frac{r\omega_o}{\mu g}$

12. A uniform cube of side *a* and mass *m* rests on a rough horizontal table. A horizontal force F is applied normal to one of the faces at a point directly above the centre of the face, at a height $\frac{3a}{4}$ above the base. The minimum value of F for which the cube begins to tip about an edge?

(a.) mg (b.) $\frac{1}{3}mg$ (c.) $\frac{2}{3}mg$ (d.) $\frac{3}{2}mg$

13. Two pieces of steel and brass weighing 40N and 20N respectively fall freely under the action of gravity from a tower. For two pieces which one of the following equal after falling an equal distance?

(a.) Acceleration (b.) Momentum (c.) K.E (d.) P.E

14. A particle starting from rest is accelerated along a straight line with an acceleration Kt, where K is constant and t is time elapsed. The distance covered by particle in time t is

(a.) Kt^3 (b.) ½Kt^3 (c.) $\frac{1}{6}Kt^3$ (d.) $\frac{1}{3}Kt^3$

Answer: Engineering Mechanics Level – 2

1. **ANS:** a

EXP:

Comparing the given equation $y = px - qx^2$ with equation of projectile motion,

$$y = x\tan\theta - \frac{gx^2}{2u^2}(1+\tan^2\theta)$$

We fine that,

$$p = \tan\theta \; and \; q = \frac{g}{2u^2}(1+\tan^2\theta)$$

$$\therefore\; u = \sqrt{\frac{g(1+\tan^2\theta)}{2q}} = \sqrt{\frac{g(1+p^2)}{2q}}$$

2. **ANS:** a

EXP:

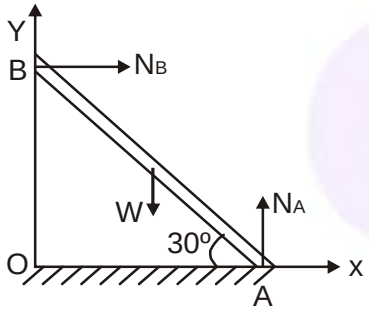
Equation of projectile motion

$$y = x\tan\theta - \frac{1}{2}\frac{gx^2}{u^2}(1+\tan^2\theta)$$

$$Slope \quad \frac{dy}{dx} = \tan\theta - \frac{gx}{u^2}(1+\tan^2\theta)$$

3. **ANS:** c

EXP:



Net torque about O is zero

$$\therefore \quad N_A(2l\cos 30^\circ) - N_B(2l\sin 30^\circ)W(l\cos 30^\circ) = 0$$

$$or, \quad \sqrt{3}N_A - N_B - \frac{\sqrt{3}}{2}W = 0 \;\ldots(i)$$

$$\sum F_y = 0$$

$$\therefore \quad N_A - W = 0$$

$$or, \quad N_A = W \qquad \ldots(ii)$$

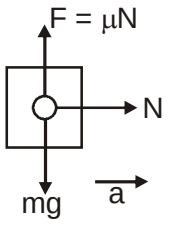
$$from\,(i)\;\&\,(ii)$$

$$N_B = \frac{\sqrt{3}}{2}W$$

4. **ANS:** c

EXP:

F.B.D of m



2. STRENGTH OF MATERIALS

2.1 SIMPLE STRESS AND STRAINS- LEVEL-1

1 A steel rod of length L and diameter D is free to expand at both ends, is uniformly heated to a temperature rise of ΔT . The young's modulus is E and coefficient of linear expansion is $\sim$. The thermal stress in the rod is.

(a) $\sim\Delta T$ (b) $E\sim\Delta T$ (c) $3E\sim\Delta T$ (d) zero

2 Consider the following statements:

1. Depending on the purpose and function, machine parts are made of different alloys and materials
2. To bear high compressive and variable stresses automobile wheels are made of alloys. Which of the following statement is correct? (Assume $E = 1.5 \times 10^8$ KN/m^2)

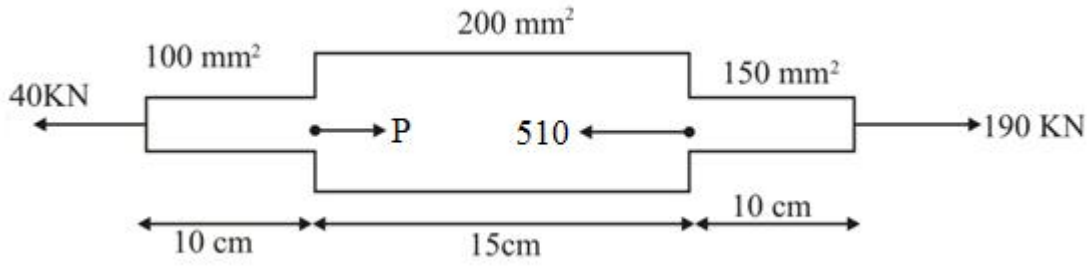
(a) Statement 1 is correct (b) Statement 2 is correct

(c) Both 1 and 2 are correct (d) Neither 1 nor 2 is correct

3 A hollow cast-iron cylinder 4 m long, 500mm inner diameter and thickness 50mm is subjected to a central load on the top when standing straight the stress produced is 80000 KN/m^2. What is the magnitude of load?

(a) 5600KN (b) 6908 KN (c) 7200KN (d) 6472 KN

4 A member ABCD is subjected to point loads as shown in figure.



What is the value of force P necessary for equilibrium?

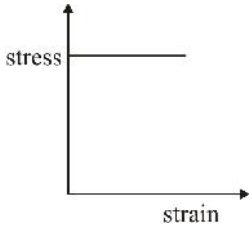
(a) 360 KN (b) 560KN (c) 660KN (d) 260KN.

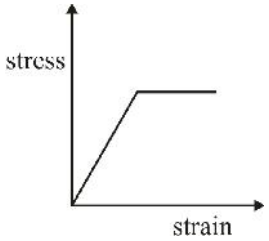
5 What are number of independent elastic constant for isotropic and anisotropic materials respectively?

(a) 2 and 9 (b) 2 and 21 (c) 9 and 21 (d) 21 and 2

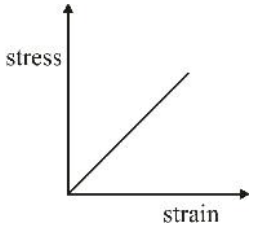
6 Select the correct stress strain graph for elasto-plastic materials?

(a) A (b)

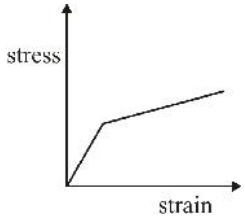




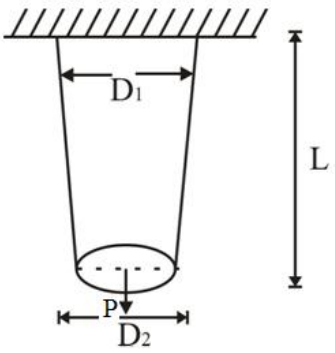
(c)



(d)



7 What is the extension of the circular tapering bar made of steel if E=200GPa, L=4m, D_1=100mm, D_2= 50 mm and P=400KN?



(a) 3.462 mm (b) 1.864 mm (c) 0.964 mm (d) 2.038 mm

8 What is the equivalent young modulus of parallel composite bar having A_1=1600 mm^2. A_2=1200mm^2, E_1= 200GPa and E_2= 250GPa?

A_1, E_1
A_2, E_2

(a) 260 Gpa (b) 242.4 GPa (c) 221. GPa (d) 142.8 GPa

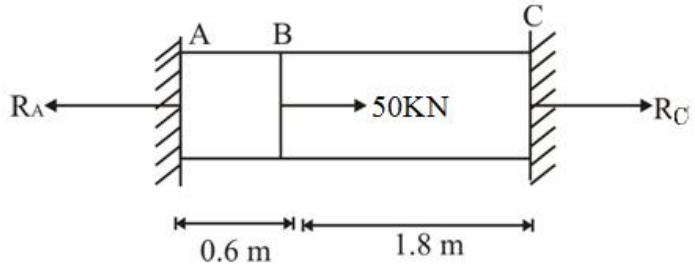
9 A cylindrical bar having diameter 30 mm, and length 300mm is subjected to a tensile load of 54KN. if the extension of bar and change in diameter are 0.112 mm and 0.00366 mm respectively then what is the value of poison's ratio?

(a) 0.227 (b) 0.327 (c) 0.424 (d) 0.297

10 Maximum stress ($\pm_{max}$) induced in a bar of length l, rotating at an angular velocity w, is given by

(a) $\frac{1}{2} \circ w^2 l^2$ (b) $\frac{1}{8} \circ w^2 l^2$ (c) $\circ w^2 l^2$ (d) $\circ w l^2$

11 A steel bar of cross-sectional area 250mm^2 held firmly by the end supports and loaded by an axial force of 50KN.



What is the value of R_C?

(a) 12.5 KN (b) 37.5KN (c) 25.5 KN (d) 32.5 KN

12 Which of the following is the brittle material?

(a) Lead (b) mild steel (c) copper (d) Rubber

13 What is the correct relationship for ratio of Bulk modulus (k) and shear modulus (G) in terms of passion ratio («)?

(a) $\frac{2(1+«)}{3(1-2«)}$ (b) $\frac{3(1+«)}{2(1-2«)}$ (c) $\frac{3(1-2«)}{2(1+2«)}$ (d) $\frac{2(1+«)}{3(1+2«)}$

ANSWER KEY LEVEL-1: SIMPLE STRESS AND STRAINS

1	2	3	4	5	6	7	8	9	10
d	c	b	a	b	b	d	c	b	b
11	12	13							
a	d	a							

SOLUTION LEVEL-1: SIMPLE STRESS AND STRAINS

1. (d) When a bar is free to expand there will be no thermal stress due to change in temperature.

2. (c) Both are correct

3. (b) inner diameter d=500mm=0.5m

Thickness, t=50mm =0.05m

$\therefore$ Outer diameter, $D = d + 2t = 0.5 + 2(0.05) = 0.6m$

Stress produce σ=80000KN/m^2.

$$\pm = \frac{P}{A} \Rightarrow P = \pm (A) = 80000 \times \frac{®}{4}(D^2 - d^2) = 80000 \times \frac{3.14}{4}[(0.06)^2 - (0.5)^2]$$
$$= 6908KN$$

4. (a) For equilibrium 40+510=P+190 $\therefore$ P=550-190=360KN

5. (b) 2 and 21

6. (d) extension of tapering bar $¢ = \frac{4PL}{®ED_1D_2}$

$$¢ = \frac{4 \times 400 \times 10^3 \times 4}{3.14 \times 200 \times 10^9 \times 0.1 \times 0.05} = 2.038 \times 10^{-3} m$$
$$= 2.038mm$$

7. (c) $E_{eqv} = \frac{A_1E_1 + A_2E_2}{A_1 + A_2} = \frac{(1600 \times 200) + (1200 \times 250)}{1600 + 1200} = 221.42GPa$

8. (b) Stress, $\pm = \frac{P}{A} = \frac{54}{\frac{®}{4}(0.03)^2} = 76.4MN/m^2$

Linear strain $= \frac{¢l}{l} = \frac{0.112}{300} = 3.73 \times 10^{-4}$

Lateral strain $= \frac{¢d}{d} = \frac{0.00366}{30} = 1.22 \times 10^{-4}$

$\therefore$ Poisson's ratio, $« = \frac{\text{Lateral strain}}{\text{linear strain}}$

$$= \frac{1.22 \times 10^{-4}}{3.73 \times 10^{-4}} = 0.327$$

9. (b) Maximum stress induced in bar $\pm_{max} = \frac{1}{8} \circ µ^2 l^2$

10. (a) As, bar is in equilibrium

$R_A + R_C = 50KN$ ...(1)

Also, since the length of the bar remained unchanged,

3. THEORY OF MACHINE

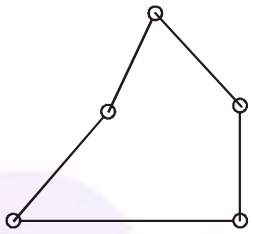
1. Simple Mechanism Level – I

1. The number of degree of freedom of a planar linkage with 7 link and 8 simple revolute joint is
(a.) 1 (b.) 2 (c.) 3 (d.) 4

2. A planar mechanism has 9 links and 11 rotary joints. The number of degrees of freedom of the mechanism, using Gruebler's criterion is
(a.) 0 (b.) 1 (c.) 2 (d.) 3

3. The connection between the piston and cylinder in a reciprocating engine corresponds to
(a.) Completely constrained kinematic pair
(b.) Incompletely constrained kinematic pair
(c.) Successfully constrained kinematic pair
(d.) Single link

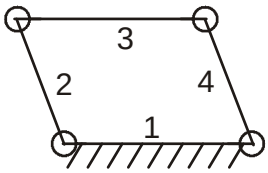
4. The given figure shows



(a.) Locked chain (b.) Constrained kinematic chain
(c.) Unconstrained kinematic chain (d.) Mechanism

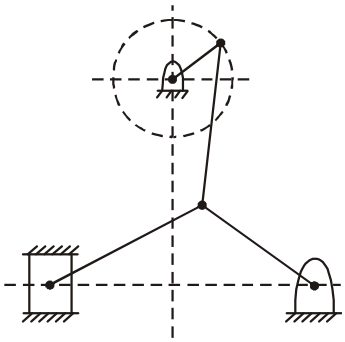
5. In a four – link kinematic chain, the relation between the number of links (L) and number of pairs (j) is
(a.) L = 2j + 4 (b.) L = 2j – 4 (c.) j = 2L + 4 (d.) j = 2L – 4

6. The number of degree of freedom of a four link plane mechanism with four revolute pair is



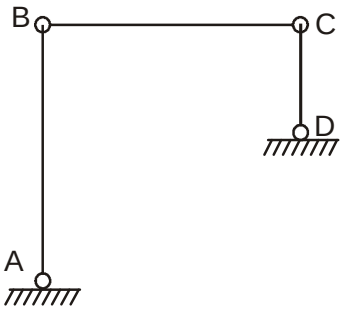
(a.) 4 (b.) 3 (c.) 2 (d.) 1

7. The mechanism shown in given figure represents



(a.) Hart's mechanism (b.) Beam engine mechanism
(c.) Watt's mechanism (d.) Toggle mechanism

8. In the given figure, ABCD is four – bar mechanism. At the instant shown, AB and CD are vertical and BC is horizontal. AB is longer than CD by 20cm. AB is rotating at 2rad/s and CD by 4 rad/s. the length CD is



(a.) 10cm (b.) 20cm (c.) 30cm (d.) 40cm

9. The whit worth quick return mechanism is formed in a slider crank chain when the
(a.) Coupler link is fixed (b.) longest link is fixed
(c.) Slider is fixed link (d.) smallest link is a fixed link

10. Oldham's coupling is the inversion of
(a.) Four bar mechanism (b.) crank and lever mechanism
(c.) Single slider crank mechanism (d.) double slider crank mechanism

Answer key

1	2	3	4	5	6	7	8	9	10
b	c	a	c	b	d	b	b	d	d

Answer: Simple Mechanism Level – I

1. **ANS:** b
EXP:
Given n = 7, j = 8, and h = 0
∴ Degree of freedom = 3 (n – 1) – 2j – h = 3 (7 – 1) – (2 × 8) – 0 = 18 – 16 = 2

2. **ANS:** c
EXP:
According to Gruebler's criterion,
D.O.F = 3(n – 1) – 2j = 3 (9 – 1) – 2 × 11 = 24 – 22 = 2

3. **ANS:** a
EXP:
Piston and cylinder corresponds to completely constrained kinematic pair.

4. **ANS:** c
EXP:
Unconstrained kinematic chain

5. **ANS:** b
EXP:
Here notation of number of pairs is j
So, L = 2j – 4

6. **ANS:** d
EXP:
D.O.F = 3 (n – 1) – 2j
Here n = 4, j = 4
∴ D.O.F = 3(4 – 1) – 2 × 4 = 9 – 8 = 1

7. **ANS:** b
EXP:
Mechanism shown in figure is Beam engine mechanism

8. **ANS:** b
EXP:
Here, AB = CD + 20
Let CD = *l*
∴ 4l = 2(l + 20)
2l = 40 ∴ *l* = 20cm

9. **ANS:** d
EXP:
When smallest link is a fixed link

10. **ANS:** d
EXP:
Double slider crank mechanism

4. MECHINE DESIGN

1. Bearings Level – I

1. The rate life of a roller bearing varies inversely as which one of the following?
(a.) Load (b.) $(load)^2$ (c.) $(load)^3$ (d.) $(load)^{3.33}$

2. The life of a ball bearing at a load of 20kN is 16000hours. What is its life if the load is increased to 40kN, keeping all other conditions same?
(a.) 1000hr (b.) 1500hr (c.) 2000hr (d.) 3000hr

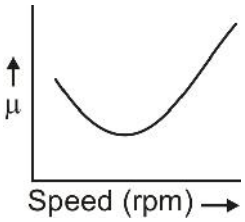
3. If the load on a ball bearing is doubled, its life
(a.) Remains unchanged (b.) increases eight times
(c.) Decreases eight times (d.) decreases two times

4. In a journal bearing P = average gearing pressure, Z = absolute viscosity of the lubricant, N = rotational speed of the journal. What is the bearing characteristic number?
(a.) $\frac{ZN}{p}$ (b.) $\frac{p}{ZN}$ (c.) $\frac{Z}{pN}$ (d.) $\frac{N}{Zp}$

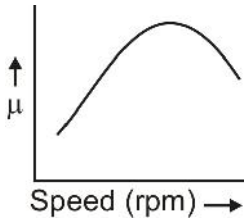
5. A journal bearing of diameter 40cm and length 50cm carries a load of 300kN. What is the average bearing pressure?
(a.) $1.5kN/cm^2$ (b.) $15kN/cm^2$ (c.) $150kN/cm^2$ (d.) None

6. Which one of the following is the lubricator regime during normal operation of a rolling element bearing?
(a.) Hydrodynamic lubrication (b.) Hydrostatic lubrication
(c.) Elasto – hydrodynamic lubrication (d.) Boundary lubrication

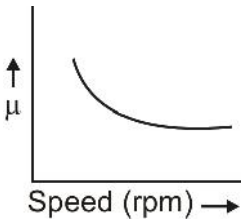
7. Which curve correctly depicts the characteristic of a hydro-dynamically lubricants journal bearing?
(a.)



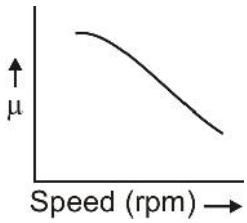
(b.)



(c.)



(d.)



8. Two identical ball bearings A and B operate at loads 60kN and 90kN respectively. What is the ratio of the life of bearing A to the life of bearing B?
(a.) 3/2 (b.) 9/4 (c.) 27/8 (d.) 81/16

9. The Sommerfeld number is

(a.) Directly proportional to load
(b.) inversely proportional to load
(b.) Directly proportional to square of load
(d.) inversely proportional to the square of load.

Answer Level-1: Bearings

1	2	3	4	5	6	7	8	9
d	c	c	a	a	c	a	c	b

MECHANICAL ENGINEERING

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