Physics Assignment answers.

N. B: L- length
V- volume
A- Area
ΔØ- Change in temperature i. e($Ø_2$-$Ø_1$)
ã- Linear expansivity
ß- Area expansivity
¥- Cubic expansivity.

30. L_1= 30cm
L_2=? Where: ã=Δl/l_1ΔØ
ΔØ= 50°
ã= 1.2×10^{-5}
Provided that increase or expansion in length is
e= l_1ãΔØ
So therefore, e= $30\times1.2\times10^{-5}\times50$
e= 0.018cm.

31. L_1=20m
L_2= L1+Δl = 20+0.02= 20.020m
$Ø_1$=5°
$Ø_2$= 55°
ã=?
Provided that, ã=Δl/l1ΔØ
ã= 20.020-20/20(55°-5°)
ã=0.020/20×50
ã=0.020/1000
ã=$2\times10^{-5}k^{-1}$

32. L1= 2m
ΔØ=100k. ã=Δl/l1ΔØ
ã=1.8×10^{-5}
L2=?
e= l1ãØ
e= $2\times1.8\times10^{-5}\times100$
e= 0.0036m.

33.real cubic expansion=cubic expansivity of glass+apparent expansivity of mercury.
So therefore, real cubic expansion = 1.82×10^{-4}
Then, cubic expansivity of glass =2.4×10^{-5}
And, apparent expansivity of mercury= ΔV/100(100-10)
Therefore 1.82×10^{-4} = 2.4×10^{-5} + ΔV/100(100-10)
1.82×10^{-4} - 2.4×10^{-5} = ΔV/100(100-10)
1.58×10^{-4} = ΔV/9000
ΔV= $9000\times1.58\times10^{-4}$
ΔV= $1.422cm^3$

34. ã of metal P= 2ã of metal Q
That is, ãp=2p
Ratio to one another is
1:2

35. L_1= 10cm
V_1= 103
$Ø_2$= 60°
$Ø_1$=10°
ΔV= 3ãVΔØ
ΔV= 3×1.2×10^{-5}×1000(60-10)
ΔV= 1.8cm.

36. L_1= 40.0cm
L_2= 40.05cm
$Ø_1$= 20°c
$Ø_2$= 45°c
ã=?
ã=l2-l1/l1ΔØ
ã= (40.05-40.00)/40(45-20)
ã= 0.05/40(25)
ã= 0.05/1000
ã= 5×10^{-5}.

37. V_1=100cm^3
ΔØ= 40°c
ã= 2.0×$10^{-6}k^{-1}$.
e= l1ΔØã.
e= 100×40×2.0×10^{-6}
e= 0.008cm.

38. L_1= 50m
L_2=?
$Ø_1$=60°c
$Ø_2$= 70°c
ã= 1.2 × 10^{-5}
1.2×10^{-5} = (l2- 50)/50(70-60)
1.2×10^{-5} × 500 = l2-50
0.006 = l_2-50
L_2 = 50+0.006
L_2= 50.006cm.

39. Real cubic expansivity = cubic expansivity of glass+apparent expansivity of mercury
Where real cubic expansivity = 1.82×10^{-4}
Cubic expansivity of glass = 8×10^{-6}
And, apparent expansivity of mercury =?
So therefore,
1.8×10^{-4} =8×10^{-6} + x. (Let apparent expansivity of glass be x)
X = 1.82×10^{-4} - 8× 10^{-6}
X= 1.72 ×10^{-4}

40. Cubic expansivity of ¥ =3ã
=3 × 2.0×10^{-5}
=6.0×10^{-5}
Volume V1= L^3= 10^3
¥= V^2-V^1/V^1ΔØ

$6.0\times10^{-5} = (V^2 - 1000)/1000\times30$

$V^2-1000 = 6.0\times10^{-5} \times 30 \times1000$

$V^2-1000= 1.8$

$V^2=1.8+1000$

$V^2= 1001.8cm$

Increase in the volume = 1001.8cm -1000cm

$= 1.8cm^3$

41. Cubic expansivity of ¥=3ã

Given that ã = 4.0×10^{-5}

¥= 3ã

¥= $3\times4.0\times10^{-5}$

¥= 1.2×10^{-4}

$V^1= L^3= 5^3= 125$

$1.2\times10^{-4} =(V^2-125)/125(120)$

$1.2\times10^{-4} \times 125(120) = V^2 - 125$

$1.8= V^2 - 125$

$V^2= 125+1.5$

$V^2=126.50cm^3$.