

6th Advanced

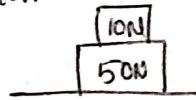
WS-10 connecting bodies

①

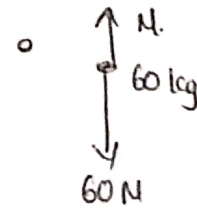
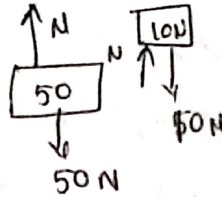
Thank

①

option A



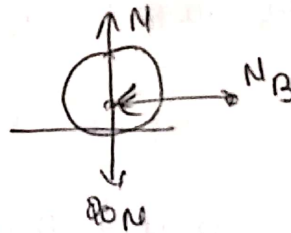
Free body diagram



②

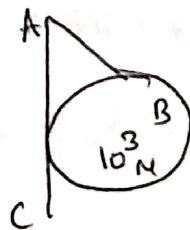


For sphere

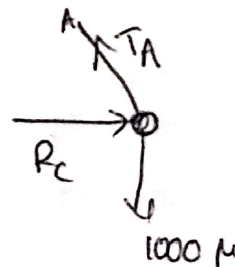


option B

③



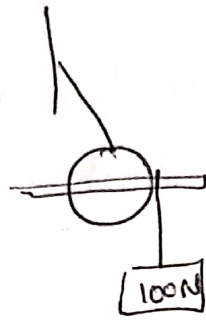
Free body diagram



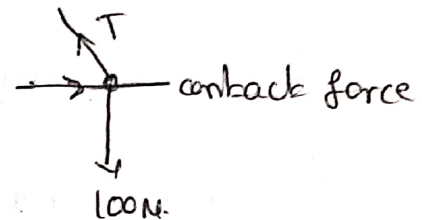
option D correct

(2)

(4)



Free body diagram



Total 3 forces are acting

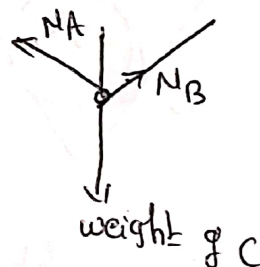
(5)



Free body diagram

N_A is reaction force
due to A

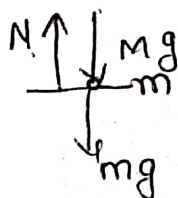
N_B → Reaction force due to B



Total Number of force = 3

(6)

For 'm' Free body diagram:

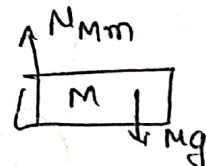


For 'm', mg downwards

Mg → weight of upper block ↓

Reaction N due to ground

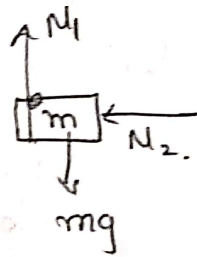
For M



N_{mm} = Reaction on M
due to m.

⑦, ⑧

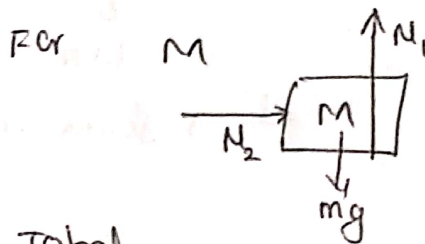
Free body diagram for m



$N_1 \rightarrow$ Reaction due to ground

$N_2 \rightarrow$ Reaction due to M .

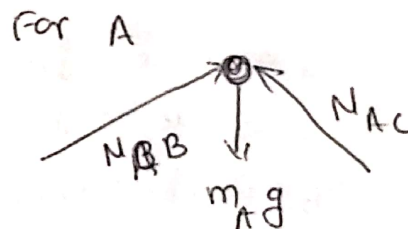
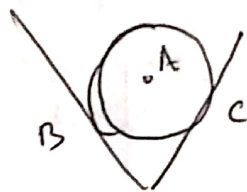
⑨



$N_2 \rightarrow$ Reaction due to m

Total 3 forces are acting on M .

⑩

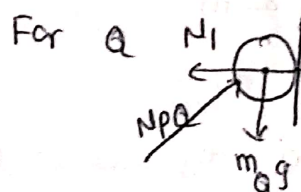
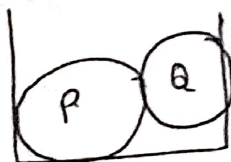


$m_A g \rightarrow$ weight of A

$N_{AB} \rightarrow$ Reaction on A due to B

$N_{AC} \rightarrow$ Reaction on A due to C

⑩



Total 3 forces

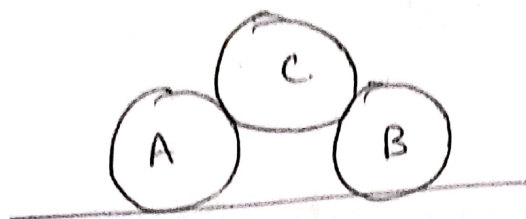
$N_1 \rightarrow$ reaction due to vertical wall

$N_{PQ} \rightarrow$ Reaction due to P on Q

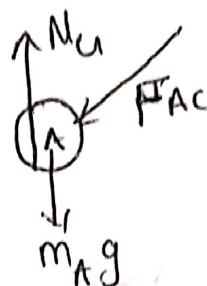
$m_Q g \rightarrow$ weight

(15)

(3)



For A Free body diagram

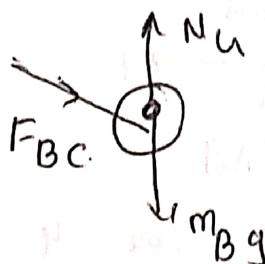


where

N_A = Reaction from ground

F_{AC} → Reaction due to C

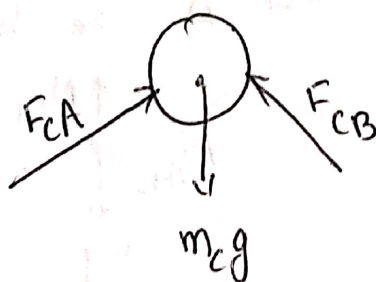
For B



N_B → Reaction due to ground

F_{BC} → Reaction due to C

For C



F_{CA} → Reaction due to A

F_{CB} → Reaction due to B

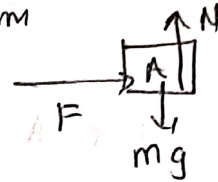
Task

CUA's

①

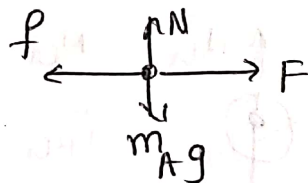
For A Free body diagram

$N \rightarrow$ Reaction from ground



②

From log free body diagram for A

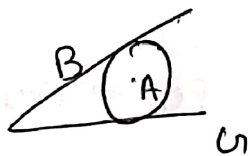


$f \rightarrow$ Tension in string

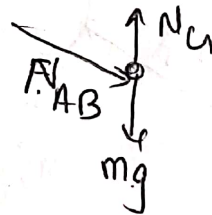
$N \rightarrow$ Reaction from ground

Total forces are -4

③



For A Free body diagram

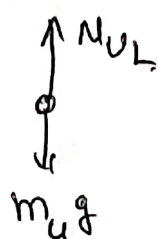


$N_u \rightarrow$ Reaction from ground

$N_{AB} \rightarrow$ Reaction due to B

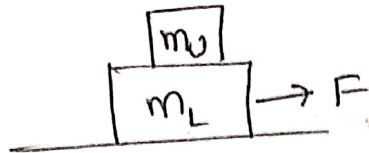
④

For m_u Free body diagram

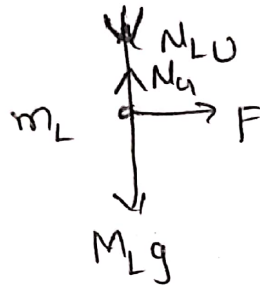


where $N_{uL} \rightarrow$ Normal reaction due to Lower body on m_u

(5)



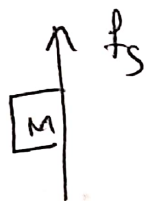
For m_L Free body diagram



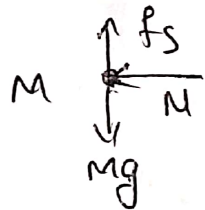
where N_{LU} - Reaction due to upper body

N_G → Reaction from ground.

(6)



For M free body diagram

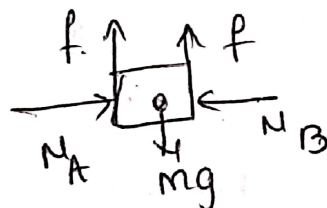


N → Reaction from vertical surface

Total 3 forces are acting

(7)

For B. Free body diagram

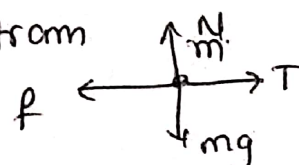


(8)

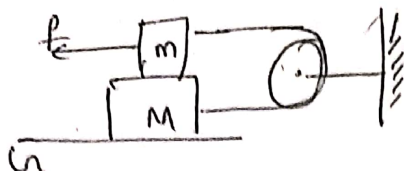
For m Free body diagram

T → Tension in string

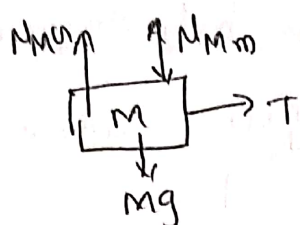
N → Reaction from M.



9



For M free body diagram

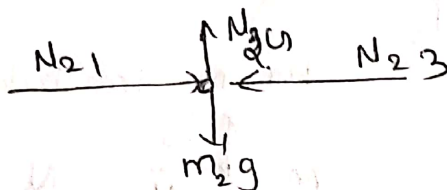


N_{Mu} → Reaction from ground

N_{Mm} → Reaction from m.

10

From fig for m_2 free body diagram



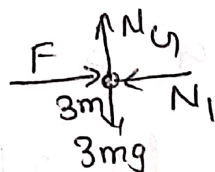
where N_{21} → Reaction from 1

N_{2u} → Reaction from ground

N_{23} → Reaction from 3

13, 14, 15

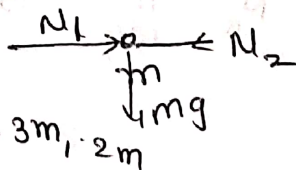
For $3m$



Total forces → 4

N_1 → Reaction from m

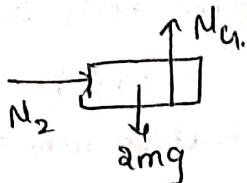
For m



Total forces - 3

N_1, N_2 → Reaction from $3m, 2m$

For $2m$



N_2 → Reaction from m

Total forces - 3