

DEPARTMENT OF ARCHITECTURE
VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA
MID-SEMESTER EXAMINATION, March -2015

ENGINEERING MECHANICS

2nd Semester (B.Architecture)

Time: 2.00 hours

Full marks: 20

Answer any four out of ~~five~~^{Six} questions including Question Number 1, which is compulsory

(Figures in the right hand margins indicate marks)

1. Answer any five of the following

(1x5)

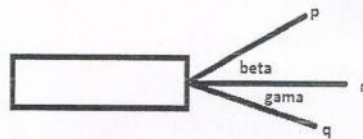
- State Varignon's theorem.
- State laws of frictions.
- State and explain Lami's theorem.
- What is limiting friction?
- What is physical independence of force?
- Engineering mechanics deals with which bodies ?

2. Show that angle of repose is equal to maximum angle of friction.

(5)

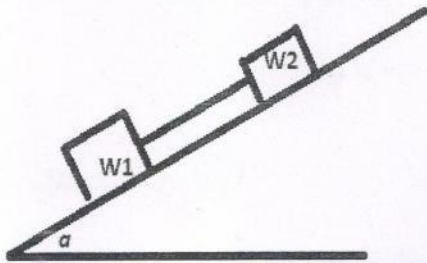
$$\alpha = \Phi.$$

3. A boat is moved uniformly along a canal by two horses pulling with force $p=890\text{N}$ and $Q=1068\text{N}$ acting at an angle $\alpha = 60^\circ$. Determine the magnitude of the resultant pull on the boat and the angle β and γ as shown in the figure. (5)

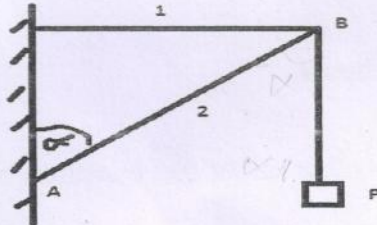


4. Two block of weight W_1 and W_2 rest on a rough inclined plane and are connected by a short piece of string as shown in the figure. If the co-efficient of friction are $\mu_1=0.2$ and $\mu_2=0.3$ respectively. Find the angle of inclination of the plane for which sliding happens. $W_1=W_2=22.25\text{N}$. (fig 1) (5)

(Fig 1)



(fig 2)



5. What axial forces does the vertical load P induce in the member of the system as shown in the figure 2. (5)
6. Motion of a particle is expressed by $x = t^3 - 3t^2 - 9t + 12$. What will be the time required for the velocity of the particle to become zero? What will be the position and acceleration of the particle when the velocity is zero? Discuss about the type of motion of the above particle. (5)