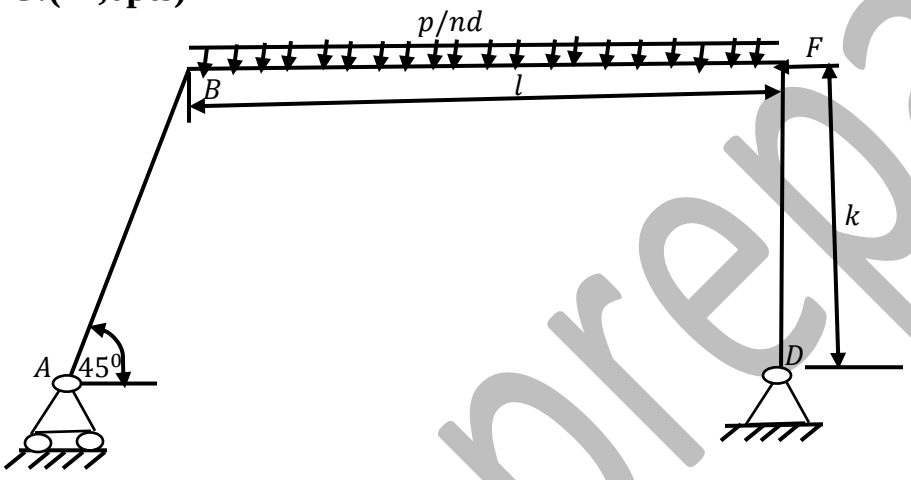
COMPETITIVE ENTRANCE EXAMINATION INTO HTTTC BAMBILI	
CYCLE:1st CYCLE **LEVEL**: 1st **OPTION**: BUILDING AND PUBLIC WORKS	**Session: 2012**
DURATION: 3hrs	

STATIC:(12,0pts)

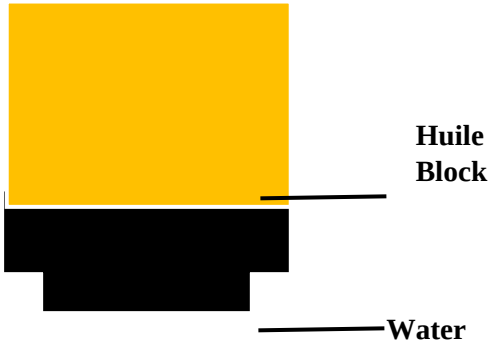


a) Calculate R_A and R_D
b) Given he equation of :
   - Shear force V(x)
   - Normal force N(x)
   - Bending moment M(x)

   In function with P, F, h and L = 5m. Draw the diagram N(x), V(x) and M(x)

Hydraulics (4,0pts)

A concrete cubic block of side a = 100cm is at equilibrium between oil and water as shown below.



Density of oil 800kg/m^3, density of concrete 2500 kg/m^3

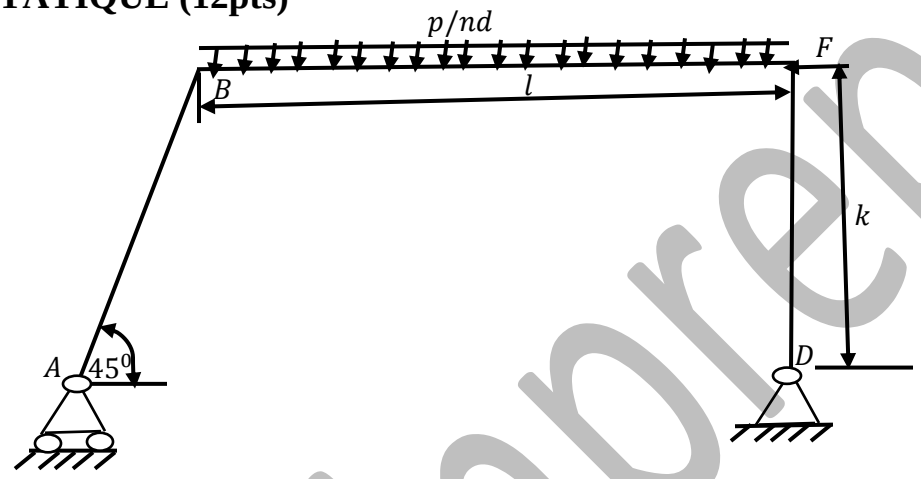
a) Calculate Archimedes' force
b) Calculate the distance X such that there should be no tension on the cable

Dynamic kinematics (2mrks)

A bucket is thrown from the top of a scaffold which is of height 13m and standing on a horizontal plane. The speed of projection is 12m/s and the initial direction of motion is 60^0 to the vertical. Find the time it will take to hit the ground.

COMPETITIVE ENTRANCE EXAMINATION INTO HTTTC BAMBILI	
CYCLE:1st CYCLE **LEVEL: 1st** **OPTION: BUILDING AND PUBLIC WORKS**	**Session: 2010**
DURATION: 3hrs	

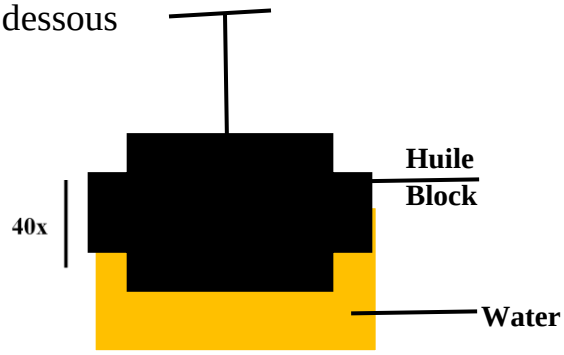
STATIQUE (12pts)



a) Calculez R_A et R_D
b) Donnez l'equation des:
   Efforts tranchants V(x)
   Efforts Normal N(x)
   Moment fléchissant M(x)
   En fonction de P, F, h and L.
c) Si P = 10KN, F = 5kN, h = 3.5m, L = 5m. donnez le diagramme N(x), V(x) and M(x)

Hydraulique (4pts)

Un bloc cubique de béton de cote a = 100cm est en équilibre entre l'huile et l'eau comme dessous



Densité d'huile 800kg/m^3, densité du béton 2500kg/m^3

a) Calculez la force d'Archimède
b) Calculez la distance X sachant qu'il n'y a point de tension sur le câble

Cinématique (4pts)

Un seau est jeté au – dessus d'échafaudage qui est situé à une hauteur de 13m et place sur un plan horizontal. La vitesse de projection 12m/s et la direction initial du mouvement est 60^0 par rapport à la vertical. Déterminer le temps que le seau prendra atteindre au sol.