# KARABUK UNIVERSITY, ENGINEERING FACULTY, AUTOMOTIVE ENGINEERING, FLUID MECHANICS, MAKE-UP EXAM, 26.01.2013

*Attention: Forbidden to use extra paper. You can use the blank space on the page. Everyone's questions and options are different from others. Time is 45 minutes. The draft solutions on the page will not read. Only will looked the options. If you think ther is a mistake in the questions, tick the last option and write answer. Then it will be evaluated in your benefit to.You can use the back of page as a draft.I wish you success... Asist.Prof.Dr.İbrahim Çayıroğlu*

**1 )** Araç River flows through the Karabuk University. Within 300 meters the river becomes head of 2,5 m. The river flows average-year of 3,125 m3/s flow rate. How many 100 W lamps electricity supplied from here. Take the turbine and generator efficiency of 75% Attention! the turbine inlet and outlet is embedded in the water.
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**2 )** A uniform block of steel (density= 7,6) will float at a mercury-water interface as in Figure. What is the distance a for this condition h=25cm? (mercury density=13,81)
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**3 )** As shown in the figure a rocket goes into space with turns. There are the liquid fuel in rocket. Diameter of tank D=2,5 m. The height of the full portion n=5 m. The height of the empty portion m=1 m dir. The rocet accelerates with 10 m/s2 acceleration for takeoff. What is the Maximum angular velocity of the rochet when to avoid any force to the top cover?
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**4 )** As shown in the figure,We want to pump water to the pool on the top of a h=25 m building. The head loss of the pipe is 0,08333 m for 1 meter. The pump efficiency is 0,8. Municipality water pressure of the city is 1,66667 bar. Flow rate of water 0,02083 m3/s is required. Accordingly, what is the power of electrik motor as kW that we need to buy?
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**5 )** We want to take 5 Liter fuel from a car petrol tank as shown in the Figure. h1 =37,5 cm, h2 = 12,5 cm, hose diameter = 4,16667 mm and 1-meter head loss of the pipe 1,66667 cm. We have a 3,25 meter hose. Accordingly, how many minutes we have to wait?
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**6 )** As shown in the figure, two garden owner wants to use running water from a pool. One of the garden will be used the water from the pipe at the bottom (point C),and the other upper overflowing water (point B) will be used. Both water flow rate must be equal. How do we set (A) valve flow rate as m3/s ? The height of the water h=2,5 m. and C pipe diameter 3,125 cm.
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1) 2) 3) 4)

5) 6)
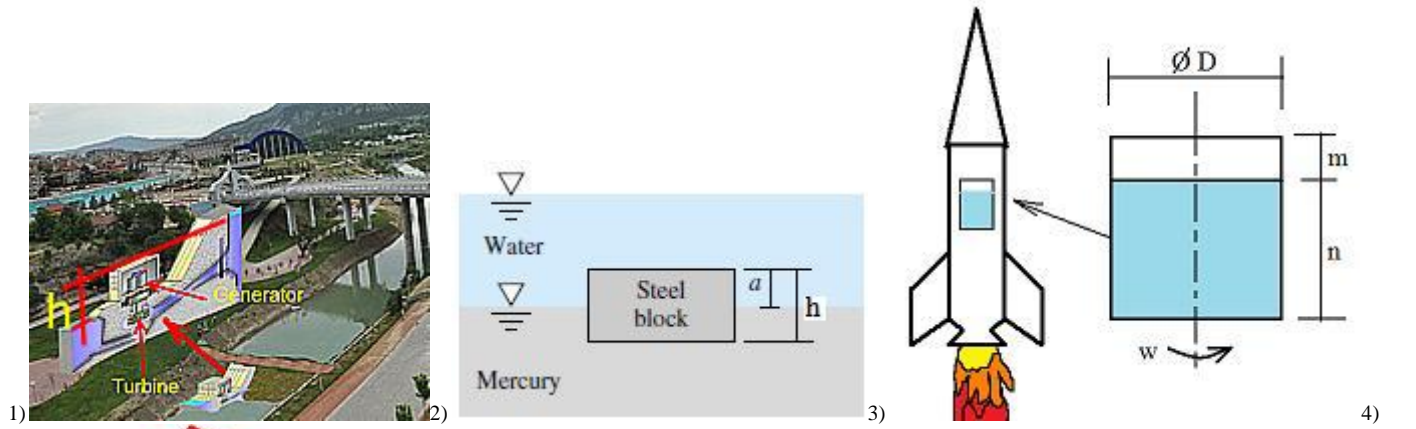
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