Total No. of Questions :8]

SEAT No. :

P4507

[Total No. of Pages : 2

[5355] - 57

M.E. (Civil) (Water Resources and Environmental Engineering)

OPEN CHANNEL HYDRAULICS

(2013 Course) (Semester-II) (501088)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Answer any five questions.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of logarithms tables, slide rule, electronics pocket calculator is allowed.***
5) ***Assume suitable data if necessary.***

Q1) a) Show that maximum velocity in a circular channel happens when y/D=0.81. **[6]**

b) Explain the characteristics of M_2 profile and state one example of its occurrence. **[4]**

Q2) a) Derive Chezy's formula. Also derive relation between Chezy's 'C' and Manning's 'n'. **[5]**

b) Explain method of direct integration for gradually varied profile computation. **[5]**

Q3) a) Classify hydraulic jump using the Froud No. Draw the sketch of each jump and state the energy dissipation possible. **[4]**

b) A triangular channel has a side slope of 1: 1 and longitudinal slope of 1/1000. Determine whether the channel is mild, steep or critical when discharge of 0.25m3/s flows through it. Take Manning's n = 0.015. Also state for which range of depths the flow will be in Zone 1, Zone 2 and Zone 3. **[6]**

Q4) a) State applications of hydraulic jump. **[2]**

b) A rectangular channel 20 m wide flow with normal depth of 2 m with a slope of bed 1 in 6400. At a certain section, the flow depth is 3 m. How far upstream or downstream of this section will the depth be 2.6 m. Use step method and take only two steps. Take Manning's coefficient = 0.015. sketch and mention the profile. **[8]**

P.T.O.

Q5) a) Derive De Marchi equation for side weir. **[6]**

b) Write short note on solitary wave. **[4]**

Q6) a) Classify the SVF profiles. **[4]**

b) Derive dynamic equation of uniformly progressive wave. **[6]**

Q7) a) Write in brief about alluvial channel bed forms. **[4]**

b) Discuss the development of Muskingum method of flood routing stating the equations and algorithm. **[6]**

Q8) a) Derive Rouse equation for suspended bed load. **[6]**

b) Explain method of characteristics for flood routing. **[4]**