

TE/civil/sem-VI/AH-II | 01/12/2014

QP Code :15099

(3 Hours)

[Total Marks] 60

- N.B. : (1) Q.No.1 is compulsory.
(2) Attempt any 4 questions out of remaining 6 questions
(3) Assume suitable data if necessary and state clearly.

- 8
8
4
20
1. (a) Explain terminal velocity of a body with example. 5
(b) Explain boundary layer separation. 5
(c) Differentiate between uniform & non uniform flow, steady & unsteady flow. 5
(d) Derive the condition for maximum discharge for a given value of specific energy. 5
2. (a) A sewer is to be laid a slope of 1 in 8100 to carry a maximum discharge of 600 litres/sec, when depth of water is 75% of the vertical diameter. Find the diameter of this pipe. Take Manning's N is 0.025. 10
(b) Derive the condition for most economical trapezoidal channel including best side slope. 10
3. (a) What is drag? What causes it? Why do we usually try to minimize it. 10
(b) Classify the surface profiles in gradually varied flow with neat sketches. 10
4. (a) Derive the Von-Karman momentum integral equation for boundary layer flows. 10
(b) Find the displacement thickness, the momentum thickness and energy thickness for the velocity distribution in the boundary layer given by
$$u/U = 2(y/\delta) - (y/\delta)^2$$
 10
5. (a) Determine the length of the back water curve caused by an afflux of 2.0 meter in a rectangular channel of width 40 meter and depth 2.5 meter. The slope of the bed is given as 1 in 11000. Take Manning's N = 0.03 10
(b) A kite 0.8 m x 0.8 m weighing 4.0 N assumes an angle of 12° to the horizontal. The string attached to the kite makes an angle of 45° to the horizontal. The pull on the string is 25 N, when the wind is flowing at a speed of 30 km/hr. Find the corresponding co-efficient of drag and lift. Density of air is given as 1.25 kg/m³ 10

Case from
Attached

LM-Con.:8936-14.

TURN OVER

6. (a) Compare Kennedy's and Lacey's silt theories. Why Lacey's conception superior to that of Kennedy's. 10
- (b) Design an irrigation canal to carry a discharge of 14 cumecs. Assume $N=0.0225$, $m = 1$ and $B/D = 5.7$ 10
7. (a) Derive the expression for loss of energy due to Hydraulic jump. 10
- (b) Write short notes on: 10
- (i) Specific Energy and specific energy curve.
 - (ii) Development of lift on an Airfoil.
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LM-Con.:8936-14.

Course : Prog. 583 to 597 T.E. (CIVIL) (Sem VI)

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Correction :

Paper is of 100 marks 3 hrs instead of 60 marks 3 hrs.

Query Update time : 01/12/2014 02:35 pm

Block No:- 2

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LCI
1/12/14

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