

B. Tech. 4th Semester (Civil Engg.)

Re- Examination, June-2013

FLUID MECHANICS-II

Paper-CE-204-F

*Time allowed : 3 hours ]*

*[Maximum marks : 100*

*Note : (i) Attempt five questions in all.*

*(ii) Question No. 1 is compulsory.*

*(iii) Attempt one question from each section.*

*(iv) All questions carry equal marks.*

1. Write short notes on any *ten* of following :  $10 \times 2 = 20$

- (i) Water Hammer
- (ii) Aging of Pipes
- (iii) Specific energy
- (iv) Types of slope
- (v) Efficient channel section
- (vi) Reaction Turbine
- (vii) Net positive suction head

- (viii) Single action pump and double action pump
- (ix) Slip
- (x) Air lift pump
- (xi) Suction Head
- (xii) Branching of pipes.

### Section-A

2. The difference in the water surface levels of two reservoirs which are connected by a syphon is 8m. The length of the syphon is 600 m and its diameter is 30 cm. Assuming  $f = 0.02$ , determine the discharge when the syphon is running full.

If the summit of the pipe line is 5 m above the surface level of the upper reservoir, determine the maximum length of inlet leg for the pipe to run full. Allow for all the losses and assume the minimum pressure at the summit of the syphon to be absolute zero.

20

3. (a) Derive expression for loss due to sudden expansion and contraction in a pipe. 10
- (b) Explain concept of equivalent length of pipe. 10

## Section-B

4. (a) Derive expression for most economical trapezoidal channel section. 10
- (b) A flow of 100 litre/sec flow down in rectangular laboratory flume of width 0.6m and having adjustable bottom slope. If Chezy's constant  $c = 56$ , determine the bottom slope necessary for uniform flow with a depth of flow 0.3 m. 10
5. (a) Derive Chezy's formula for uniform flow for a channel. 10
- (b) Derive expression for surge in channel. 10

## Section-C

6. (a) Explain Pelton Turbine with its components. 10
- (b) Derive an expression for specific speed in turbine. 10
7. A kite weighing 12.26N has an effective area of  $0.9\text{m}^2$ . The tension in the kite string is 32.37N, when the string makes an angle of  $45^\circ$  with the horizontal. For a wind of

(4)

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32km/hr, what are the coefficients of lift and drag if the kite assumes an angle of  $8^\circ$  with the horizontal ? Take specific weight of air as  $11.8\text{kg/m}^3$ . 20

**Section-D**

8. (a) What is cavitation and their effects ? How cavitation can be prevented ? 10
- (b) What is priming and explain priming devices ? 10
9. (a) Explain principles and working of reciprocating pump. 10
- (b) Explain working of air vessels. 10

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