

D020832(020)

**B. Tech. (Eighth Semester) Examination,
April-May 2023**

(Civil Engg. Branch)

OPEN CHANNEL FLOW

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt all questions. Part (a) of each question is compulsory and carries 4 marks each. Attempt any two parts from (b), (c) and (d) of each question and carries 8 marks.

Unit-I

1. (a) State true or false : According to the assumptions of continuity equation, the fluid flow is steady.

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- (b) Which is more accurate, Chezy's or Manning's formula? What are the factors which are affecting Velocity Distribution in Open Channel?
- ✓(c) Differentiate between open channel flow and pipe flow. Explain in detail.
- (d) What are the parameters of open channel? Explain types of flow.

Unit-II

2. ✓(a) Define Critical Depth.
- α(b) What is the relationship between specific energy and depth of flow?
- ⊙(c) What is momentum principle open channel flow?
- ✗(d) Which principle is also known as principle of fluid pressure transmission?

Unit-III

3. (a) Define non uniform flow.
- ✓(b) The discharge in a channel with bottom width 3 m is 12 m³/s. If Manning's n is 0.13 m^{-1/3}s and the

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- streamwise slope is 1 in 200, find the normal depth if:
- (i) the channel has vertical sides (i.e. rectangular channel);
- (ii) the channel is trapezoidal with side slopes 2H : 1V.
- ✓(c) What are the classification of surface profiles in gradually varied flow? What are the assumptions in GVF?
- (d) What is the flow in a curved path? What are the classification of flow profiles?

Unit-IV

4. (a) Define Surge.
- ✓(b) Explain in detail evaluation of the jump elements in rectangular and non rectangular channels on horizontal and sloping beds?
- (c) What are the types of water waves? Explain in detail.
- ⊙(d) What is the condition for unsteady flow? Write down the equation of motion for unsteady flow.

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Unit-V

5. (a) State True and False :

Flow varies with longitudinal distance.

(b) What is spatially varied flow? What is the equation of SVF with increasing discharges?

(c) Write down in detail on differential equation for SVF with decreasing discharge.

(d) What is control section in gradually varied flow? Explain in detail.