

Possible questions for the final exam – CEE 3500 – Fall 2005
Part 3 – Pipe flow (2), Open Channel Flow, Flow Measurements

[88]. The presence of a pump in a pipe flow diagram is represented by a sudden _____ in the HGL and EL.

- (a) increase (b) decrease (c) flattening (d) reversal

[89]. The presence of a turbine in a pipe flow diagram is represented by a sudden _____ in the HGL and EL.

- (a) increase (b) decrease (c) flattening (d) reversal

[90]. If e is the absolute roughness of a pipe, and D is the diameter, the relative roughness is calculated as:

- (a) D/e (b) eD (c) e/D (d) e^2/D

[91]. For fully-rough, turbulent flow in a pipeline, the friction factor f is a function of:

- (a) Reynolds number and relative roughness (b) Reynolds number only
(c) Relative roughness only (d) None of the above

[92]. For laminar flow, the friction factor f is a function of:

- (a) Reynolds number and relative roughness (b) Reynolds number only
(c) Relative roughness only (d) None of the above

[93]. An open channel laid on a constant bed slope with the same cross-section throughout is referred to as a:

- (a) trapezoidal (b) rectangular (c) prismatic (d) cylindrical

[94]. If a constant discharge is carried by a prismatic open channel and the depth does not change for a large reach of the channel the flow is said to be _____.

- (a) variable (b) unsteady (c) turbulent (d) uniform

[95]. If the depth at a section of a prismatic channel carrying a constant discharge is measured to be 3.5 ft at a given section, while it is 3.9 ft at another section 1200 ft downstream, the flow in this reach is more likely to be:

- (a) uniform (b) gradually varied (c) unsteady (d) laminar

[96]. If the Froude number of a uniform flow is found to be less than 1, the flow is referred to as:

- (a) subcritical (b) critical (c) supercritical (d) none of the above

[97]. If the Froude number of a uniform flow is found to be greater than 1, the flow is referred to as:

- (a) subcritical (b) critical (c) supercritical (d) none of the above

[98]. Let y_o be the normal depth of flow in a prismatic channel, and y_c be the critical depth of flow. If $y_o > y_c$, the flow is referred to as:

- (a) subcritical (b) critical (c) supercritical (d) none of the above

[99]. Let y_o be the normal depth of flow in a prismatic channel, and y_c be the critical depth of flow. If $y_o < y_c$, the flow is referred to as:

- (a) subcritical (b) critical (c) supercritical (d) none of the above

[100]. Let y_o be the normal depth of flow in a prismatic channel with a bed slope S_o . Let y_c be the critical depth of flow corresponding to a slope S_c . If $y_o > y_c$, then:

- (a) $S_o > S_c$ (b) $S_o < S_c$ (c) $S_o = S_c$ (d) None of the above

[101]. Let y_o be the normal depth of flow in a prismatic channel with a bed slope S_o . Let y_c be the critical depth of flow corresponding to a slope S_c . If $y_o < y_c$, then:

- (a) $S_o > S_c$ (b) $S_o < S_c$ (c) $S_o = S_c$ (d) None of the above

[102]. The sudden increase of water depth accompanied by strong turbulence and some air entrainment into the flow in an open channel is referred to as a _____.

- (a) drop (b) free fall (c) hydraulic jump (d) none of the above

[103]. Ideally, the flow depth over a broad crested weir must be equal to the _____ depth.

- (a) normal (b) critical (c) conjugate (d) none of the above

[104]. Let y_o be the normal depth of flow in a prismatic channel with a bed slope S_o . Let y_c be the critical depth of flow corresponding to a slope S_c . If $y_o < y_c$, then the slope is said to be:

- (a) Mild (b) Steep (c) Horizontal (d) Adverse

[105]. Let y_o be the normal depth of flow in a prismatic channel with a bed slope S_o . Let y_c be the critical depth of flow corresponding to a slope S_c . If $y_o > y_c$, then the slope is said to be:

- (a) Mild (b) Steep (c) Horizontal (d) Adverse

[106]. For a horizontal channel ($S_o = 0$), the normal depth of flow is:

- (a) finite (b) infinite (c) zero (d) none of the above

[107]. For a channel with an adverse slope ($S_o < 0$), the normal depth of flow is:

- (a) finite (b) infinite (c) zero (d) none of the above

[108]. For a channel with an mild slope ($S_o > 0, S_o < S_c$), the normal depth of flow is:

- (a) finite (b) infinite (c) zero (d) none of the above

[109]. While analyzing gradually varied open channel flow you find that the channel has a mild slope. If the depth of flow at a point is measured to be $y > y_o$, the gradually varied flow (GVF) curve is most likely to be a(n) _____ curve.

- (a) S1 (b) M1 (c) M2 (d) M3

[109]. While analyzing gradually varied open channel flow you find that the channel has a steep slope. If the depth of flow at a point is measured to be $y > y_o$, the gradually varied flow (GVF) curve is most likely to be a(n) _____ curve.

- (a) S1 (b) S2 (c) S3 (d) C3

- [110]. A hydrometer is an instrument used for measuring the _____ of a liquid.
 (a) viscosity (b) surface tension (c) specific weight (d) specific gravity
- [111]. A _____ tube is used to measure velocities in fluid flows.
 (a) Darcy (b) Pitot (c) piezometer (d) none of the above
- [112]. A propeller meter is used to measure _____ in fluid flows.
 (a) pressure (b) viscosity (c) velocities (d) shear stress
- [113]. Which of the following devices is NOT used to measure velocities in fluid flow:
 (a) hot-wire anemometer (b) hot-film anemometer (c) Pitot tube (d) point gage
- [114]. While using a propeller meter to measure the mean velocity in a shallow stream using a single measurement you would typically submerge the propeller meter at a depth equal to ___ of the flow depth.
 (a) 0.2 (b) 0.6 (c) 0.8 (d) 0.5
- [115]. The ratio of the area of the vena contracta to the orifice area in an orifice plate meter is referred to as the _____ coefficient.
 (a) contraction (b) velocity (c) discharge (d) sluice
- [116]. In a rectangular channel, the ratio of the depth downstream of a sluice gate to the gate opening is referred to as the _____ coefficient.
 (a) contraction (b) velocity (c) discharge (d) sluice
- [117]. Let C_c = contraction coefficient, C_v = velocity coefficient, and C_d = discharge coefficient in an orifice plate, nozzle, or sluice gate. Which one of the following formulas is correct?
 (a) $C_c = C_v C_d$ (b) $C_v = C_c C_d$ (c) $C_d = C_c C_v$ (d) $C_c = C_v / C_d$
- [118]. A venturi meter is used to measure _____ in a pipeline.
 (a) viscosity (b) flow rate or discharge (c) vorticity (d) atmospheric pressure
- [119]. A rotameter is used to measure _____ in a pipeline.
 (a) viscosity (b) flow rate or discharge (c) vorticity (d) atmospheric pressure
- [120]. A sharp-crested weir in a rectangular channel that extends through the entire width of the channel is referred to as a _____ rectangular weir.
 (a) suppressed (b) contracted (c) Cippoletti (d) v-notch
- [121]. For a rectangular weir the discharge varies with the head to the power _____.
 (a) 2/3 (b) 3/4 (c) 1/2 (d) 3/2
- [122]. For a rectangular weir the discharge varies with the head to the power _____.
 (a) 2/3 (b) 5/2 (c) 1/2 (d) 3/2

