KATIHR ENGINEERING COLLEGE, KATIHAR
CIVIL ENGINEERING, 2nd Year (4th Semester)

Subject: Hydraulics & OCF
Max marks: 30 **INSTRUCTOR: RASHID MUSTAFA**

TEST-1

1. The channel whose boundary is not deformable is known as ----------
2. Piezometric head is the sum of ----------
3. A channel bed slope 0.0009 carries a discharge of $30m^3/s$ when depth of flow is 1.0m.What is the discharge carried by an exactly similar channel at the same depth of flow if the slope is decreased to 0.0001?
   (a) $10\ m^3/s$ (b) $15\ m^3/s$ (c) $60\ m^3/s$ (d) $90\ m^3/s$.
4. For a hydraulic efficient rectangular section ,the ratio of width to normal depth is ----------
5. Turbulent boundary layer thickness is proportional to (a) $1/x^{0.2}$ (b) $x^{0.2}$ (c) $x^{0.4}$ (d) $x^{0.8}$
6. Conveyance of a channel section is directly proportional to
   (a) Bed slope (b) Area of cross-section (c) Perimeter (d) manning's coefficient
7. For most economical triangular channel section the ratio of its hydraulic radius and depth of flow is equal to ----------
8. An efficient rectangular channel has normal depth of flow 1.2m. What is the Chezy's coefficient if Manning's roughness is 0.016 ----------
9. In the above question the value of friction factor ----------
10. A laminar boundary layer develops on a flat plate. The thickness of the boundary layer at a distance x from the leading edge is 1 cm. The thickness of the boundary layer at a distance 4x will be in cm ----------
11. The dimension of Manning's roughness is
    (a) $L^{1/6}$ (b)$L^{1/2}T^{-1}$ (c) $L^{-1/3}\ T$ (d) $L^{-1/3}T^{-1}$
12. A trapezoidal section is hydraulically efficient when the angle from the vertical is
    (a) 60^0 (b) 30^0 (c) 45^0 (d) None
13. If the bed particle size d_{50} of a natural stream is 2.0 mm, then by Strickler formula the manning's n for the channel is about (a) 0.017 (b) 0.023 (c) 0.013 (d) 0.044
14. A triangular channel of apex angle of 60^0 has a critical depth of 0.25m.The discharge in l/s is
    (a) 60 (b) 640 (c) 160 (d) 40
15. An efficient triangular channel has depth of flow 1.0m and longitudinal slope 1 in 5000. The bed shear stress in (N/m^2) is ----------
16. The velocity profile in a boundary layer follows one seventh power law, the flow type will be----------

17. Necessary condition for the flow is just on the verge of separation ----------

18. For shallow stream the average velocity would be
    (a) $V_{0.6}$ (b) $V_{0.2}$ (c) $V_{0.8}$ (d) average of $V_{0.2}$ and $V_{0.8}$

19. An open channel carries water with a velocity of 0.605m/s. If the average bed shear stress is 1.0 N/m^2, the chezy coefficient C is equal to ----------

20. In the turbulent region, there is small region exist from the solid boundary where flow is still laminar calculate the thickness of small region(in mm) if shear stress is 1.0kN/m^2 and dynamic viscosity of water is $2x10^{-4}$ poise----------

21. The thickness of laminar boundary layer on a flat plate at a point X is 2 cm and at a point Y, 1 m downstream of X is 3 cm. The distance of X from the leading of the plate (in m) is ----------

22. In a wide rectangular channel, an increase in the normal depth to 20% corresponding to percent increase in discharge is ----------

23. The velocity distribution in laminar boundary layer is given by relation u/U = y/**δ**. What is the Momentum thickness for the boundary layer?
    (a) **δ**/2 (b) **δ**/3 (c) **δ**/4 (d) **δ**/6

24. The velocity profile for a turbulent boundary layer is given by u/U = $(y/\boldsymbol{\delta})^{1/7}$,The shape factor for this turbulent boundary layer shall be
    (a) 7/9 (b) 9/7 (c) 7/8 (d) 7/72

25. If $\boldsymbol{\delta}_1$ and $\boldsymbol{\delta}_2$ denotes the boundary layer thickness at a point distance x from the leading edge on a flat plate, when the Reynolds numbers are 100 and 256 respectively; then the ratio of $\boldsymbol{\delta}_1$ to $\boldsymbol{\delta}_2$ will be ----------?

26. If the velocity profile for a laminar boundary layer is given by u/U = sin $(\frac{\Pi}{2}.\frac{y}{\delta})$; the momentum correction factor for the profile is
    (a)1.12 (b) 0.9 (c) 1.6 (d) $\frac{\Pi^2}{8}$

27. Most efficient trapezoidal section is required to keep a maximum discharge of 21.5 m^3/s.Slope of channel bottom is 1/2500, C=70, the value of n----------?

28. The drag coefficient for laminar flow varies with Reynolds number (R_e) is
    (a) $R_e^{0.5}$ (b) R_e (c) R_e^{-1} (d) $R_e^{-0.5}$

29. For hydraulically efficient triangular channel the Froude number in terms of V, y and g would be ----------?

30. A flat plate with a sharp leading edge id placed along a free stream of fluid flow. Local Reynolds number at 3 cm from the leading edge is $1x10^5$. What is the thickness of the boundary layer?
    (a) 0.47mm (b) 0.35mm (c) 0.23 mm (d) 0.12 mm

END OF THE PAPER