KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2018

Marks scored:

Level : B. E.
Year : III

Course : CIEG 301
Semester: I

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date FEB 2 8 2018

SECTION "A"
[20 Q. × 0.5 = 10 marks]

Tick (√) the most appropriate answer.

1. The product of shear stress due to viscosity and cross section area of flow is .....
   a. Dynamic viscosity force
   b. shear force
   c. Viscous force
   d. Fluid inertial force

2. A flow in which the quantity of flowing per second is constant, is called .....flow
   a. Steady
   b. Streamline
   c. Turbulent
   d. Unsteady

3. According to Chezy's formula, the discharge through an open channel is (where A = Area of flow , C= Chezy's constant, R= Hydraulic radius, and S= bed slope)
   a. $A*\sqrt{RS}$
   b. $C*\sqrt{RS}$
   c. $AC*\sqrt{RS}$
   d. $RS*\sqrt{A*C}$

4. Water hammer occurs in a pipe when .....
   a. There is leakage in the pipe
   b. The pipe experiences friction
   c. The flow of fluid through the pipe is suddenly brought to rest by closing of the valve
   d. The fluid is at rest

5. According to Bernoulli's equation
   a. $Z+p/\gamma+v^2/2g=$ constant
   b. $Z + p/\gamma - v^2/2g=$ constant
   c. $Z - p/\gamma + v^2/2g=$ constant
   d. $Z - p/\gamma - v^2/2g=$ constant

6. Pipes of diameters d_1, d_2 and d_3 and having lengths l_1, l_2 and l_3 are to be replaced by an equivalent pipe of uniform diameter d and of same length (l) i.e. $l= l_1+l_2+l_3$. The size of equivalent pipe is given by
   a. $l/d^2 = l_1/d_1^2 + l_2/d_2^2 + l_3/d_3^2$
   b. $l/d^3 = l_1/d_1^3 + l_2/d_2^3 + l_3/d_3^3$
   b. $l/d^4 = l_1/d_1^4 + l_2/d_2^4 + l_3/d_3^4$
   d. $l/d^5 = l_1/d_1^5 + l_2/d_2^5 + l_3/d_3^5$

7. According to Darcy's formula, the loss of head due to friction in the pipe is (where f = coefficient of friction, L = Length of pipe, v = velocity of liquid in pipe and D = Diameter of pipe)
   a. $(f*L*v^2)/gD$
   b. $(4f*L*v^2)/2gD$
   c. $(3f*L*v^2)/2gD$
   d. $(f*L*v^2)/2gD$

8. Reynold's number is the ratio of inertia force to
   a. Pressure force
   b. Elastic force
   c. Gravity force
   d. Viscous force

9. The most economical section of a trapezoidal channel is the one which has
   a. Breadth half the depth
   b. Depth half the sloping side
   c. Hydraulic radius half the breadth
   d. Side slope half the top width

10. The velocity through a channel of circular section will be maximum when the depth of water is ..... the diameter of the circular channel.
a. 0.35 times b. 0.65 times c. 0.81 times d. 0.95 times

11. The loss of head at entrance of a pipe is (where v = velocity of water in the pipe)
a. $v^2/2g$ b. $(0.5*v^2)/2g$ c. $(0.35*v^2)/2g$ d. $(0.75*v^2)/2g$

12. If the depth of flow in an open channel is less than the critical depth, the flow is called.....
a. Critical flow b. Turbulent flow c. Subcritical flow d. Supercritical flow

13. The relation between the critical depth and specific energy is given by .....
a. $(q/g)^{1/2}$ b. $(q^2/g)^{1/3}$ c. $(q^3/g)^{1/4}$ d. $(q4/g)^{1/5}$
Where the symbol has their usual meaning.

14. Those channels in which the flow transport the sediment having the same characteristics as that of material in the channel is called.....
a. Prismatic b. Alluvial
c. Non- Prismatic d. Rigid boundary channel

15. Dimension Shields number, C_s is given by
a. $\tau_0/(\gamma_s - \gamma_w)*d$ b. $\tau_0/(\gamma_w - \gamma_s)*d$
c. $(\tau_0*d)/(\gamma_s - \gamma_w)$ d. τ_0/γ_s*d
Where the symbol has their usual meaning.

16. The force exerted by the flowing liquid on the channel perimeter is called.....
a. Normal force b. Pressure force c. Tractive force d. Lift force

17. Kinematic similarity between the model and prototype is the
a. Similarity of motion b. Similarity of lengths
c. Similarity of discharge d. Similarity of forces

18. In Hardy Cross method of solving pipe network, the algebraic sum of head losses round each loop must be .....
a. Positive b. Zero c. Negative d. One

19. The number of water surface profiles type in gradually varied flow are...
a. 3 b. 6 c. 9 d. 12

20. The dynamic equation of gradually varied flow is given by.....
a. $S_b-S_f = (dy/dx)[1-(Q^2*T/g*A^3)]$ b. $S_f-S_b = (dy/dx)[1-(Q^2*T/g*A^3)]$
c. $S_b-S_f = [1-(Q^2*T/g*A^3)]$ d. $S_b-S_f = (dy/dx)[1-(Q^2*A^3/g*T)]$