Reg. No. :

Question Paper Code: 54106

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fourth Semester

Civil Engineering

15UCE406- APPLIED HYDRAULIC ENGINEERING

(Regulation 2015)

Duration: 1.15 hrs   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The minimum specific energy in terms of critical depth is   CO1- R

    (a) $3b/2h_c$ (b) $3/4h_c$ (c) $5/2h_c$ (d) $3/2h_c$

2. Most economical section of a triangular channel, is   CO1-R

    (a) Equilateral triangle   (b) Right angled triangle

    (c) Isosceles triangle with 45° vertex angle   (d) Right angled triangle with equal sides.

3. Manning's formula is used to find out   CO2- R

    (a) Discharge of flow in steams   (b) Velocity of flow in steams

    (c) Area of cross section   (d) None of the above

4. The flow in open channel is said to be subcritical if the Froude number   CO2-R
    is

    (a) Less than 1.0   (b) Equal to 1.0   (c) Greater than 1.0   (d) None.

5. The following one is not the water profile   CO3- R

    (a) Mild curve   (b) Smooth curve   (c) Steep curve   (d) Horizontal curve

6. Highest dam in India, is   CO3-R

    (a) Bhakra dam   (b) Hirakund dam   (c) Nagarjuna Sagar (d) Iddiki dam.
                                                    dam

7   Draft tubes are used in   CO4- R

    (a) Pelton turbine   (b) Impulse turbine   (c) Kaplan turbine   (d) None of the above

8 A turbine is called pelton wheel turbine if at the inlet of the   CO4-R
   turbine the total energy is……..

   (a) kinetic energy only   (b) kinetic energy and pressure energy

   (c) pressure energy only   (d) none of the above

9. Slip is the   CO5-R

   (a)Theoretical discharge – Actual discharge   (b) Actual discharge - Theoretical discharge

   (c) No discharge   (d) High discharge

10. Operation of reciprocating motion is done by a _____ source   CO5-R

   (a) Power   (b) Energy   (c) Momentum   (d) Inertia

<p align="center">PART – B (3 x 8= 24 Marks)</p>

<p align="center">**(Answer any three of the following questions)**</p>

11. The discharge of water through a rectangular channel of width 10m, is   CO1- App   (8)
    22 m^3/s when the depth of flow of water is 1.6m, calculate

    (i)   Specific energy

    (ii) Critical depth and critical velocity

12. (i) A trapezoidal canal has side slopes 3H to 4 V and slope of its bed is   CO2- App   (8)
    1in 2000. Determine the optimum dimensions of the canal, if it has to
    carry water at 0.5m^3/s.

13. The depth of flow of water at a certain section of a rectangular   CO3- Ana   (8)
    channel is 2m wide & 0.3m. The discharge through the channel is 1.5
    m^3/s. determine whether the hydraulic jump will occur or not, if so find
    its height, loss of energy per kg of water and power lost.

14. A Pelton wheel is to be designed for a head of 60m running at 200   CO4- App   (8)
    rpm. The Pelton wheel develops 95.64KW power. The velocity of the
    bucket is 0.45 times the velocity of the jet. Overall efficiency is 0.85
    and coefficient of the velocity is = 0.98 .

15. Single acting reciprocating pump has a diameter of 90mm and stroke   CO5- App   (8)
    length 60mm. The length and the diameter of the suction pipe are
    5.0m and 50mm respectively. If the suction lift of the pump is 5.2m
    and separation occurs when pressure in the pump falls below 2.5m of
    water absolute. Find the maximum speed at which the pump can be
    run without separation in the pipe.

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