TH-2 Hydraulics and Irrigation Engineering

Full Marks: 80   Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1.   Answer **All** questions   2 x 10

   a.   Define Viscosity and write down its unit in C.G.S system.

   b.   Define density and its unit.

   c.   Write down the relationship between atmospheric pressure, absolute pressure and gauge pressure.

   d.   What is the mechanical efficiency of a centrifugal pump? Write down its mathematical formula.

   e.   Write down the assumptions of Bernoulli's equation.

   f.   What is meant by surface and sub-surface irrigation.

   g.   What is crop season.

   h.   Differentiate between GCA and CCA.

   i.   Write down Dicken's and Ryve's formula for estimation of flood discharge.

   j.   What is meant by " runoff".

2.   Answer **Any Six** Questions.   6 x 5

   a.   Derive expression for total pressure exerted on vertical surface.

   b.   Find the head loss due to friction in a pipe of diameter 300mm and of length 50m through which water is flowing at a velocity of 3m/sec by using (i) Darcy's formula,(ii) Chezy's formula for which take C= 60.

   c.   Describe briefly the operation of reciprocating pump.

   d.   Describe hydrological cycle with a neat sketch.

   e.   Define base, delta and duty and derive the relationship between them.

   f.   Discuss at least two remedies adopted for water logging.

   g.   What is meant by cross drainage work. Explain it's necessity.

3 A pipe line carrying oil of specific gravity0.87, changes in diameter   10
   from200mm diameter at a piston (A) to 500mm diameter at a piston
   (B) which is 4m at a higher level.If the pressure at "A" and "B" are
   9.81N/cm2 and 5.886N/cm2 respectively. The discharge is
   200m3/sec. Determine the loss of head & direction of flow.

4 A simple U-tube manometer containing mercury is connected to a   10
   pipe in which an oil of specific gravity 0.8 is flowing .The pressure
   in the pipe is vacuum. The other end of the manometer is open to the
   atmosphere. Find the vacuum pressure in pipe if the difference of
   mercury level in the two limbs is 20cm and height of oil in the left
   limb from the centre of the pipe is 15m below.

5 Explain in detail the various causes of failure of an Earthen Dam   10
   with sketches.
6 Draw a general layout of a barrage. Also explain the functions of   10
   different parts.
7 Describe the methods to prevent water logging.   10