Total No. of Questions : 8] **SEAT No. :**

P3776 **[Total No. of Pages : 2**

[4760] - 86
M.E. (Civil - W.R.E.E.) (Semester -II)
OPEN CHANNEL HYDRAULICS
(2012 Pattern)

Time : 3 Hours] ***[Max. Marks : 100***

Instructions to the candidates :

1) ***Answer any three questions from each section.***
2) ***Answers to the two sections should be written in separate answer booklet.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Your answer will be valued as a whole.***
6) ***Use of electronic pocket calculator is allowed.***
7) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) A trapezoidal channel 5 m wide and having side slope of 1.5 horizontal: 1 vertical is laid on a slope of 0.00035. The roughness coefficient n = 0.015. Find the normal depth for a discharge of 20 m^3/s through this channel. **[8]**

b) Derive Chezy's formula. Derive relation between Chezy's 'C' and Manning's 'n'. **[8]**

Q2) a) Write in detail about control of jump by baffle walls. **[8]**

b) Derive relation between conjugate depths for a hydraulic jump on sloping floor. **[8]**

Q3) a) Derive dynamic equation of gradually varied flow. **[8]**

b) A river 100 m wide and 3 m deep has an average bed slope of 0.0005. Estimate the length of GVF profile produced by a low weir which raises the water surface just upstream of it by 1.5 m. Assume n=0.035. Use direct step method. **[8]**

P.T.O.

Q4) Write short notes on (any three) **[18]**

a) Standard step method of GVF computation

b) Hydraulic jump in expanding channels

c) Classification of open channel flows

d) Types of open channels.

SECTION - II

Q5) a) Derive equation for spatially varied flow with decreasing discharge. **[8]**

b) What is bottom rack? Draw possible flow profiles in a bottom racks. **[8]**

Q6) a) What is flood routing? Describe categories of flood routing. List hydraulic and hydrologic flood routing methods. **[8]**

b) Describe explicit method of channel flood routing. **[8]**

Q7) a) Derive dynamic equation of Gradually varied unsteady flow. **[8]**

b) Derive differential form of monoclinal rising wave. **[8]**

Q8) Write short notes on (any three) **[18]**

a) Types of surges

b) Classification of Spatially varied flow

c) Method of characteristics

d) Muskingum method.