Code: 9A01802 **R09**

B.Tech IV Year II Semester (R09) Regular & Supplementary Examinations April 2016

DESIGN & DRAWING OF IRRIGATION STRUCTURES

(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer any ONE question
All questions carry equal marks
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1 Design a cross drainage work to suit the following hydraulic particulars:
Canal:
Discharge = 35 m^3/s
Bed width = 20.00 m
Bed level = +40.00
F.S.L = +42.00
Ultimate bed level = +39.75 (U.B.L)
Ultimate F.S.L = +42.50 (U.F.S.L)
Average velocity in the canal = 0.83 m^3/s
Left bank top width = 5.00 m
Right bank top width = 2.00 m
Canal side slopes both inside and outside are 2:1 in embankment with a minimum cover of 1 m over the hydraulic gradient. Top of canal bank = +43.50. Average ground level on flanks of drain = +38.00 and the bed level of the drain may also be taken as +38.00 at the point of crossing.
Drain:
Catchment area = 8 km^2. The maximum computed discharge is worked out at 60 m^3/s using a coefficient of C = 15 in Ryves formula. Maximum flood level of the drain at the site of crossing is +39.75. Average bed level of the drain at the site of crossing is +38.00. Hard soil suitable for the foundation is met +37.00. Also draw the plan, longitudinal and cross sections.

2 Design a sluice taking off from a tank irrigating 200 hectares at 1000 duty. The tank bund through which the sluice is taking off has a top width of 2 m with 2:1 side slopes. The top level of bank is +40.00 and the ground level at site is +34.50. Good hard soil for foundation is available at +33.50. The sill of the sluice at off-take is +34.00. The maximum water level in tank is 38.00. The full tank level is +37.00. Average low water level of the tank is +35.00. The details of the channel below the sluice are as under:
Bed level = +34.00
F.S.L = +34.50
Bed width = 1.25 m
Side slopes $1\frac{1}{2}$ to 1 with top of bank at +35.50
Draw the plan, longitudinal section and cross section.

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