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2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

IV B. TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS
IRRIGATION-II
(CIVIL ENGINEERING)

NOVEMBER 2005

TIME: 3 HOURS

MAX MARKS: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. Annual runoff in terms of depth over the catchments area of 1675 square Kilometers of a reservoir is given below. Years 1962 1963 1964 1965 1966 1967 1968 1969 Run off(cm) 98 143.5 168.3 94 95.3 152.4 110 131.3
Draw the flow mass diagram. What is the average yield from the catchment? What should be the live storage capacity of the reservoir to use the source fully. If dead storage is 20% of the live storage, what is gross storage. Mark the filling and empty periods on the mass curve. [16]
2. Discuss in detail the classification of dams. Distinguish between rigid and non-rigid dams. [16]
3. (a) Distinguish clearly between a low gravity dam and high gravity dam
(b) What is the basic profile of a gravity dam? How the practical profile is obtained from the basic profile [6+10]
4. (a) Distinguish between rolled fill and hydraulic fill earthen dam?
(b) Draw a cross section of homogeneous type of earthen dam? Show revetments and back berms. [8+8]
5. (a) Enumerate the important types of spillway gates? Describe with a neat sketch the construction and working of Tainter gate.
(b) Compute the discharge over an ogee weir with coefficient of discharge equal to 2.4 and a head of 2m. The length of spillway is 100m. The weir crest is 8m above the bottom of the approach channel having the same width of spillway. Consider velocity of approach also. [8+8]
6. What are the rating curves? Discuss in detail the various relative positions of the tail water curve and jump rating curve and stilling basin arrangements provided in each case. [16]
7. Design a canal drop (2.5m) of trapezoidal notch type for the following particulars. Particulars U/S of canal drop D/S of canal drop Full supply discharge 5 m³/s 5 m³/s Full supply depth 1.5 m 1.5 m Bed width of canal 6.0 m 6.0 m Bed level of canal +10.0 +7.5 Full supply level +11.5 +9.0 Assume that there will be full discharge when the depth of flow is 1.5 m and half full supply discharge when the depth of flow is 1.0 m in the canal.
8. A syphon aqueduct is to be designed for a canal to cross an alluvial stream. The canal particulars at the site of crossing are : [16]
Depth of canal = 4 m
FSL of canal = + 104.00
Bed level of canal = + 100.00
Bed width of canal = 15 m
Slope = 1/3600
Particulars of the drain are :
HFL of stream = + 102.00
Bed level of stream = + 100.00
Maximum flood discharge = 80 m³/s
The canal is lined and rectangular in shape at the crossing.
Design the vent ways, wings, canal transitions. Any other data needed may be assumed.