

- c) Explain important elements of a typical hydro-electric plant.
d) Explain canal regulation in details.

OR

Explain development of hydropower in India.

Roll No

CE - 701

B.E. VII Semester

Examination, December 2016

Design of Hydraulic Structure

Time : Three Hours

Maximum Marks : 70

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each questions are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) What is meant by reservoir? What is its use?
b) Draw typical section of earth dam with details.
c) What are the causes of failure of earth dam?
d) An earthen dam made of homogeneous material has the following data.

Coefficient of permeability of dam material = 5×10^{-8} cm/sec
Level of top of dam = 200m, level of deepest river bed = 178m, HFL of reservoir = 197.5m, width of top = 4.5m, upstream and down stream slope are 3:1 and 2:1 respectively.

Determine phreatic line and discharge.

OR

The yearly rainfall data for the catchment of a proposed reservoir site for 35 years is given in Table below. Compute from this data, the value of dependable rainfalls for 60% and 75% dependability percentage.

Year	Rainfall (cm)	Year	Rainfall (cm)	Year	Rainfall (cm)	Year	Rainfall (cm)
1956	98	1965	66	1974	88	1983	102
1957	100	1966	184	1975	94	1984	80
1958	101	1967	90	1976	107	1985	109
1959	99	1968	76	1977	110	1986	122
1960	85	1969	118	1978	208	1987	115
1961	112	1970	86	1979	114	1988	140
1962	116	1971	92	1980	104	1989	138
1963	78	1972	96	1981	120	1990	60
1964	160	1973	93	1982	108	-	-

Unit - II

2. a) What is the difference between earth dam and gravity dam?
- b) Explain elementary profile of gravity dam.
- c) What are various galleries used in gravity dams?
- d) Explain design considerations for fixing the section of dam.

OR

Explain stability analysis method for gravity dam.

Unit - III

3. a) What is the purpose of providing spillway? Where is it located?
- b) What is the purpose of providing energy dissipaters in hydraulic structures?
- c) Explain design of canal regulating structures.
- d) Explain characteristics and design of Ogee spillway.

OR

Explain vertical lift gates, radial gates and canal regulating structures.

Unit - IV

4. a) What are the considerations in design of structures on pervious formation.
- b) What is meant by weir and barrages?
- c) Explain Khosla's theory.
- d) Explain factors governing design of barrages.

OR

Explain design of waterways and crest levels.

Unit - V

5. a) What is the purpose of providing canal structures?
- b) What is cross drainage work?