

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]  
(2125)

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B. Tech 8th Semester Examination

Water Power Engineering (OS)

CE-8011

Time : 3 Hours

Max. Marks : 100

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

- Note :** (i) Attempt five questions in all.  
(ii) Select one question from each of the section A, B, C & D.  
(iii) Section E (all sub parts) is compulsory.  
(iv) Use of non-programmable calculators is allowed.

#### SECTION - A

1. (a) Discuss merits and demerits of water power as compared to other power sources. (10)  
(b) Write detailed note on arrangement of run-of-river plants. (10)
2. (a) Classify hydro power plants in different ways. (10)  
(b) When a run-of-river plant operates as a peak load station with a peak load factor of 20%, all its capacity is firm capacity. What will be the minimum flow in the river so that the station may serve as the base flow station? Consider following data :  
Rated installed capacity of generator=12000 kW  
Operating head=18 m  
Plant efficiency=80%  
Estimate the daily load factor of the plant if stream flow is 16 cumecs. (10)

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#### SECTION - B

3. (a) Explain clearly about determination of reservoir capacity. (10)  
(b) Write notes on (i) Tail race channel (ii) Surge tank. (10)
4. (a) Discuss the analytical approach of determination of economical diameter of penstock. (10)  
(b) Discuss about cost allocation in water engineering project for different purpose. (10)

#### SECTION - C

5. (a) Differentiate between impulse and reaction turbines. (10)  
(b) Discuss different types of underground power stations. (10)
6. (a) Discuss different measures of controlling silt at hydro power plants. (10)  
(b) Write notes on (i) Efficiency of turbine (ii) Components of surface power station. (10)

#### SECTION - D

7. (a) Write a note on engineering feasibility of hydro power installation. (10)  
(b) Explain how cost and estimation of a hydro power project is determined. (10)
8. (a) Explain the contents of general project report. (10)  
(b) Write notes on operation of a power plant system. (10)

**SECTION - E**

9. Attempt following questions:

- (a) Write two advantages of water power.
- (b) Explain briefly about firm power.
- (c) Enlist components of hydro power plant.
- (d) Explain flood routing.
- (e) Where the conveyance tunnel is required?
- (f) Explain the function of draft tube.
- (g) Explain the concept of useful life of reservoir.
- (h) Enlist the factors affecting the dimension of machine hall.
- (i) Explain the meaning of economic feasibility.
- (j) Write about usefulness of project report. (10×2=20)