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BICEE-007

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DCLEVI
DIPLOMA ENGINEERING

Term-End Examination

December, 2012

BICEE-007 : WATER POWER ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : *Answer **five** questions in all and question No. **1** is **compulsory**.*

1. Select one correct answer from the following : **7x2=14**

(a) A run off river plant for hydro power generation is essentially a :

(i) high head scheme

(ii) low head scheme

(iii) medium head scheme

(iv) any of these

(b) Point out the correct statement with reference to earthen dams.

(i) These dams are very costly.

(ii) They are less susceptible to failure as compared to rigid dams.

(iii) They can be constructed almost on every type of foundation.

(iv) Highly skilled labour is generally not required.

(c) The bottom portion of a concrete or a masonry gravity dam is usually stepped in order to :

(i) increase the overturning resistance of the dam.

(ii) increase the shear strength at the base of the dam.

(iii) decrease the shear stress at the base of the dam.

(iv) none of the above

(d) On moderate foundations, and particularly in seismic areas, the type of dam which can preferably be considered for construction, is :

(i) masonry gravity dam

(ii) earthen dam

(iii) rock fill dam

(iv) arch dam

(e) Hydraulic jump is widely used for dissipation of energy in :

(i) ogee spillways

(ii) trough spillways

(iii) side channel spillways

(iv) all of these

(f) The flow through Penstocks and Pressure conduits is, generally :

(i) laminar (ii) turbulent

(iii) both (i) and (ii) (iv) none of these

(g) The minimum power, which a hydro-power plant can generate throughout the year, is called :

(i) power plant capacity

(ii) power plant load

(iii) firm power

(iv) water power

2. Discuss as to why the study of hydrology is important for any water resource planning. 14

3. What are the principle components of a hydro electric scheme ? Discuss the utility of each component. 14

4. Define and differentiate between the following in connection with hydro-power : 14

(i) Firm and Secondary Power

(ii) Load factor, utilisation factor and plant factor.

(iii) Design head and effective head.

5. A run-off river plant with an installed capacity of 15,000 kW operates at 28% load factor when its serves as a peak load station : **14**

(a) What should be the minimum discharge in the stream, so that it may serve as a base load station ? The plant efficiency may be assumed to be 80% when working under a head of 20m.

(b) Also calculate the maximum load factor of the plant when the discharge with stream is 35 cumecs.

6. Discuss the various factors which govern the selection of a particular type of dam for a particular project. **14**

7. (a) Enumerate the different type of spillways which are used in dam construction ? **7**

(b) Discuss briefly the design principles that are involved in the design of an ogee spillway. **7**

8. Write short notes on ***any four*** of the following : **4x3½=14**

(a) Power Duration curve.

(b) Penstock valves.

(c) Selection of Turbine.

(d) Power House.

(e) Intakes.

(f) Conveyance system.
