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Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 23169 Roll No.

B. Tech. Examination 2021-22

(Even Semester)

HYDRAULIC STRUCTURES

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : 8×1=8

(a) What is meant by a dam and a reservoir?

(b) Write down the various phases of investigation of dam site.

(c) What are 'cut offs'?

(d) What is dividing groyne?

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(e) Write down the name of various forces causing instability in a gravity dam.

(f) What is grounting?

(g) Enumerate the different types of earthen dams?

(h) What are different types of buttress dams?

SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) What are the various investigations which are carried out at a dam site and also write the factors affect the selection of the most suitable dam for a particular site?

(b) Draw a neat sketch of layout of a diversion headwork and explain the functions of components.

(c) Explain different causes of failures of earth dams.

(d) Determine the maximum and minimum vertical stresses to which the foundation of the dam will be subjected from the following data :

Total overturning moment about toe $(\Sigma M_0) = 1.2 \times 10^6$ kN–m, $(\Sigma M_R) = 2.5 \times 10^6$ kN–m, $\Sigma V = 6 \times 10^4$ kN. Base width of dam = 55 mm. Slope of d/s face = 0.8 : 1.

Also calculate the maximum principal stress at the toe. Neglect tail water depth.

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each questions. 5×8=40

3. (a) What useful purpose is served by a dam? What are the ill-effects of dam construction?

(b) What are different types of dams based on the function served? DEscribe in brief.

(c) Write short notes on the following :

(i) Geological investigations for a dam

(ii) Economic height of dam

4. (a) What are the two principal methods of regulating the canal supplies in a diversion head works scheme?