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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATION- OCTOBER 2019
B.Tech VII Semester

COURSE CODE: 10B13CE735   MAX. MARKS: 25

COURSE NAME: Dam and Reservoir Design

COURSE CREDITS: 03   MAX. TIME: 1.5Hr

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume suitable data wherever required.

1. A contour survey of a reservoir site gives the following data:

Contour R.L.(m)	200	210	220
Area (hec)	6.0	18.1	34.0

    The capacity of the reservoir up to 200 m elevation is found to be 14.1 hec-m. Determine the general equation for the area-elevation curve and capacity-elevation curve. Also determine the reservoir capacity at RL 225 m.   [4]

2. The prior water rights make it obligatory to release the full natural flow or 12 hec-m whichever is lesser. If the increased net pool area is 100 hectares, find the storage capacity of the reservoir assuming that only 70% of the rainfall on the catchment area has been restored by the reservoir.

Month	Inflow at dam site(ha-m)	Evaporation losses(cm)	Precipitation(cm)	Demand(ha-m)
January	5	1.5	1.5	16
February	5	1.5	2.0	15
March	0	2.4	0.5	10
April	0	9.0	0	05
May	0	15.0	0	04
June	15	5.0	2.0	04
July	300	10.0	20	06
August	500	11.0	20	06
September	100	10.0	10	10
October	15	9.0	02	16
November	06	7.5	0	16
December	01	2.0	0	16

    [6]

3. A masonry dam 10 m in height is trapezoidal in section with a top width of 1 m and bottom width of 8.25 m. The face exposed to water has a batter of 1H:10V. The maximum water surface touches the top of the dam. Check for the stability of the dam under following criterion:
    (a) Factor of safety against overturning
    (b) Factor of safety against sliding
    (c) Shear friction factor
    (d) Vertical and shear stresses at the toe and heel
    Take coefficient of friction as 0.75,unit weight of masonry as 2240 kg/m³ and permissible shear stress of joint as14kg/cm². Show proper calculations.   [9]

4. Showing proper stress distribution figures, derive the equation for principal and shear stress at heel and toe with proper explanation.   [6]