ADAMAS UNIVERSITY	**ADAMAS UNIVERSITY** **END-SEMESTER EXAMINATION : JANUARY 2021** (Academic Session: 2020 – 21)		
Name of the Program:	B.Tech.	**Semester:**	VII
Paper Title:	**Water Resource Engineering II**	**Paper Code:**	ECE44103
Maximum Marks :	40	**Time duration:**	3 Hrs.
Total No of questions:	8	**Total No of Pages:**	2

Answer all the Groups

Group A

Answer all the questions of the following $5 \times 1 = 5$

1. **a)** When Rabi crops are sowing in India and during which month it is harvested?
b) What is the permissible depth of water table below the ground level for the yield of Cotton?
c) What are the components of a "Chute Spillway"?
d) What do you mean by 'Nappe' and 'End Contraction' in a weir structure?
e) What is the function of 'Canal Head Regulator' in a diversion headwork?

GROUP –B

Answer *any three* of the following $3 \times 5 = 15$

2. With a proper sketch write a short note on "Rock fill weir".

3. What are differences between 'Weir' and 'Barrage'?

4. Using Lacey's method, design an irrigation canal in alluvial soil with silt factor f = 0.9, to carry a discharge of 15 m^3/s. Assume side slopes as 1H: 2V.

5. Find an expression of the base of a gravity dam considering the dam is safe in sliding. Consider only the elementary profile of the gravity dam.

GROUP –C

Answer *any two* of the following $2 \times 10 = 20$

6. An unlined canal in alluvial soil has annual seepage loss of 3.2 m^3/s per 10^6 m^2 of wetted perimeter. The canal has a wetted perimeter of 25 m and has annual maintenance cost of Rs. 0.40/m^2 of wetted perimeter. There is a huge scarcity of water in the area and as such the canal is to be lined with 13 mm thick cement concrete lining, so as to reduce the annual seepage loss to 0.05 m^3/s per 10^6 m^2 of wetted perimeter. The lined canal will have a wetted perimeter of 24 m. The extra cost of lining works out to be Rs. 26/m^2. If the average annual revenue per m^3/s of water is Rs. 5.00 lakhs, and the percentage reduction in annual maintenance cost is 42%, decide whether it is economically feasible to provide canal lining. Assume the life of canal lining as 50 years and the interest rate is 6% per annum. **(10)**

7. (a) The cultivable commanded area of a watercourse is 1200 hectares. Intensities of sugarcane and wheat crops are 20% and 40% respectively. The duties for the crops at the head of the watercourse are 730 hectares/cumec and 1800 hectares/cumec, respectively. Find (i) the discharge required· at the head of the watercourse (ii) determine the design discharge at the outlet, assuming a time factor equal to 0.8.

(b) Briefly explain the types of "Deck Slab Buttress Dam" **(7+3)**

8. Design a suitable section for the overflow portion of a concrete gravity dam having the downstream face sloping at a slope of 0.7 H: 1 V. The design discharge for the spillway is 8,000 cumecs. The height of the spillway crest is kept at RL 204.0 m. The average river bed level at the site is 100.0 m. The spillway length consists of 6 spans having a clear width of 10 m each. Thickness of each pier may be taken to be 2.5 m.

(10)

_____