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Diploma in Civil Engineering**Term-End Examination****December, 2010****BCE-061: IRRIGATION ENGINEERING***Time : 2 hours**Maximum Marks : 70*

Note : Question number 1 is compulsory. Attempt any four questions from the remaining questions.

1. Select the correct answer from the four given options. 1x14=14

(a) Out of 400 M ha - m annual rainfall in India, the portion which gets evaporated is

(i) 15% (ii) 17.5%

(iii) 20% (iv) 22.5%

(b) The formula for calculating discharge from Cipolette weir is:

(i) $.0186 LH^{3/2}$ (ii) $.0186 H^{5/2}$

(iii) $.0138 H^{5/2}$ (iv) $.0138 LH^{3/2}$

- (c) Ram Ganga dam Project is an example of :
- (i) Storage irrigation
 - (ii) Flood irrigation
 - (iii) Direct irrigation
 - (iv) Lift irrigation
- (d) The gross and net irrigation requirements for a given field are 8 cm and 6.4 cm, respectively. The irrigation efficiency of the system is :
- (i) 60%
 - (ii) 70%
 - (iii) 80%
 - (iv) 90%
- (e) Which one of the following is not a critical stage for irrigation ?
- (i) Shooting
 - (ii) Booting
 - (iii) Milk stage
 - (iv) Jointing
- (f) Efficiency of water conveyance accounts for :
- (i) transfer losses
 - (ii) transmit losses
 - (iii) evaporation losses
 - (iv) infiltration losses

(g) A crop requires about 10 watering at an interval of 11 days and a water depth of 8 cm is applied in each irrigation. The delta for the crop is :

- (i) 0.8 m
- (ii) 0.88 m
- (iii) 8.8 m
- (iv) 0.08 m

(h) The area proposed to be irrigated by a minor irrigation project is :

- (i) < 1000 ha
- (ii) < 1500 ha
- (iii) < 2000 ha
- (iv) < 10000 ha

(i) Which of the following is not a type of earth lining ?

- (i) soil - cement
- (ii) compacted earth
- (iii) stabilized earth
- (iv) hard pan.

(j) The Manning's coefficient is basically a measure of :

- (i) flow velocity
- (ii) flow discharge
- (iii) flow friction
- (iv) flow losses

- (k) A spillway is basically a :
- (i) canal escapers
 - (ii) canal fall
 - (iii) safety valve
 - (iv) energy dissipator
- (l) Persian wheel is normally powered by :
- (i) man
 - (ii) animal
 - (iii) engine
 - (iv) motor
- (m) Contour furrows carry water :
- (i) along slope
 - (ii) across slope
 - (iii) along length of field
 - (iv) along width of field
- (n) Water use efficiency of drip irrigation system is :
- (i) 50-65%
 - (ii) 60-75%
 - (iii) 70-85%
 - (iv) 80-95%

2. (a) Discuss the development of irrigation in India. Where do we stand now ? 7
- (b) Define catchment area and its peak run-off. 7
Estimate maximum flood discharge from a drainage basin having an area of 10000 sq km located within 100 km of east-coast ($C_1 = 8.5$)

3. (a) Explain the importance of irrigation scheduling. What are the critical stages of irrigation in wheat crop ? 7
- (b) Calculate net amount of irrigation water to be applied for a field with following parameters : 7
- (i) F.C = 20% ;
- (ii) M.C before irrigation = 14%
- (iii) Root zone depth = 20 cm
- (iv) Bulk density of soil to be assumed suitably.
4. (a) What are the different types of irrigation losses ? Why is it important to account for them ? 7
- (b) An area of 2.0 hectares was irrigated by canal water. The depth of water penetration varied linearly from 1.5 m at the starting end of field to 1.2 m at the tail end. Determine the water distribution efficiency. 7
5. (a) What are the advantages of canal lining ? Differentiate between brick and concrete lining. 7
- (b) Suggest measures to be taken to avoid water logging due to canal water seepage. 7

6. (a) Classify different types of dams. 7
Differentiate between buttress dam and arch dam.
- (b) What are the various impurities present in water ? Explain EC, SAR and ESP. 7
7. Write short notes on the following : $3\frac{1}{2} \times 4 = 14$
- (i) Micro irrigation
 - (ii) Energy dissipators
 - (iii) Pump selection
 - (iv) Surface drains
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