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Diploma in Civil Engineering
Term-End Examination
June, 2012

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. (A) Select the correct answer from four given options. 1x7=7
- (a) India's annual rain fall is about:
 - (i) 100 cm (ii) 120 cm
 - (iii) 130 cm (iv) 140 cm.
 - (b) The X - axis in a rainfall chart is :
 - (i) total rainfall
 - (ii) instant rainfall
 - (iii) rainfall intensity
 - (iv) time duration
 - (c) Which of the following is not a type of reservoir ?
 - (i) Storage
 - (ii) Conservation
 - (iii) Multipurpose
 - (iv) Lift

- (d) Total water requirements of a crop does not depend on :
- (i) soil type
 - (ii) temperature
 - (iii) wind velocity
 - (iv) method of irrigation
- (e) Unit of delta is :
- (i) cm (ii) ha
 - (iii) cumec (iv) cusec
- (f) In the design of unlined canal, Lacey's formula includes an additional factor known as :
- (i) silt factor
 - (ii) sand factor
 - (iii) clay factor
 - (iv) gravel factor
- (g) Irrigation use efficiency in a drip irrigation system ranges between :
- (i) 60 - 70% (ii) 70 - 80%
 - (iii) 80 - 95% (iv) 95 - 98%

(B) State *true* or *false* against the following statements.

1x7=7

- (a) Basically water logging is rise of water table unto root zone.
- (b) Proportion of sodium ion to other cation in soil should be less than 10%
- (c) Straight borders are preferred when fields are given gentle slope.

- (d) An aquiclude is essentially permeable to the flow of water.
- (e) The radius of influence is the distance from the centre of a pumped well to the point of maximum drawdown.
- (f) India has been grouped into 120 agro-climatic regions and 160 agro - ecological sub regions.
- (g) Damodar valley corporation is an example of direct irrigation method.
2. (a) Discuss advantages and ill effects of irrigation 7
- (b) A drainage basin having an area of 5000 sq.Km. is located in central India (C=16). 7
Estimate the maximum flood discharge from the basin.
3. (a) Discuss irrigation scheduling in rice crop. 7
- (b) Calculate net amount of irrigation water for a field of wheat crop with the following data. 7
F.C. = 18%; M.C. before irrigation 12% root zone depth= 25cm; Bulkdensity = 1.59/c.c.
4. (a) Write five terms chiefly used in water planning. Differentiate between irrigable command area and gross command area. 7

- (b) The rice crop requires 10 cm of water at an interval of 8 days. Find the delta for rice. Make suitable assumptions. 7
5. (a) With the help of a typical labelled layout. Explain briefly the different components of a canal. 7
- (b) Explain ill effects of canal irrigation. 7
6. Explain two important methods of well development. Calculate the discharge from a fully penetrating well of 300 mm diameter with the following data. 14
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|----------------------|------------|
| Aquifer thickness | - 20 m |
| Drawdown | - 5 m |
| Permeability | - 2 cm/min |
| Radius of influences | - 400 m. |
7. Write short notes on the following : 3½x4=14
- (a) Water quality parameters
- (b) Fertigation
- (c) Pump performance and selection
- (d) Furrow irrigation.
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