

**PART – C**

6. Explain the procedure of designing Sarda type fall. 20
7. How would you proceed to determine the seepage line through a homogenous earthen dam with a horizontal drainage. 20

**PART – D**

8. Explain the design procedure for the standard stilling basin type I. 20
9. (a) Explain the method of fixation of waterway of drain in an aqueduct. 10
- (b) What is spillway ? Why are they provided ? Explain any *one* type of spillway with neat sketch. 10

Roll No. ....

**24514**

**B. Tech. 7th Semester (Civil Engg.)**  
**Examination – December, 2016**

**IRRIGATION ENGG. - II**

**Paper : CE-407-F**

***Time : Three Hours ] [ Maximum Marks : 100***

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt *five* questions in all. Question No. 1 is *compulsory*. Attempt *one* question from each of the *four* Parts. All questions carry equal marks.

1. Answer the following questions briefly :  $2 \times 10 = 20$
- (a) What is purpose of storage weir ?
- (b) What do you understand by launching apron ?
- (c) What precautions do you take against scour in well design.
- (d) List various methods of flood routing.
- (e) Mention features of design of syphon aqueduct.

- (f) What is the length of crest in Sarda type fall.
- (g) What is the criteria for design of d/s wings in Sarda type fall ?
- (h) Explain the qualities of a good siphon.
- (i) Draw a neat sketch of Ogee spillway.
- (j) What is difference between weir & barrage.

### PART – A

2. (a) A stream has a width of 30 m, depth of 3 m & a mean velocity of 1.25 m/sec. Find the height of weir to be built on the stream floor to raise the water level by 1 m. Assume value of discharge coefficient as 0.95. 10
- (b) Following particulars were recorded from a barrage : 10
- (i) maximum reservoir level = 212 m
  - (ii) Pond Level = 211 m
  - (iii) d/s HFL in river = 210 m
  - (iv) maximum design flood discharge =  $3500 \text{ m}^3/\text{s}$
  - (v) crest level of barrage = 207 m
  - (vi) crest level of head regulator = 208 m
  - (vii) River bed level = 205 m
  - (viii) coefficient of discharge =  $2.1 \text{ m}^{1/2}/\text{sec}$  for barrage
  - (ix) coefficient of discharge =  $1.5 \text{ m}^{1/2}/\text{sec}$  for head regulator

- (x) design discharge of main =  $500 \text{ m}^3/\text{sec}$  canal
- Determine the number of gates required for the barrage & the head regulator of each gate has 10 m clear span, Neglect :
- (i) end contraction due to piers and abutments,
  - (ii) velocity of approach.

3. Sketch a suitable cross-section of a guide banks as used in river training works. Explain the process of launching aprons in such works. 20

### PART – B

4. Describe step by step procedure that you will adopt for flood routing computations required for reservoirs under 'trial and error method'. 20
5. Design following components of syphon aqueduct :
- (a) drainage water way, (b) canal water way, (c) levels at different sections, (d) contraction & expansion transition for the following data : 20
  - (i) Discharge of canal = 25 cumecs
  - (ii) Bed width of canal = 20 m
  - (iii) Depth of water level of canal = 1.5 m
  - (iv) Bed level of canal = 160.00 m
  - (v) High flood discharge of drainage = 400 cumecs
  - (vi) HFL of drainage = 160.50 m
  - (vii) BL of drainage = 158.00 m
  - (viii) General Ground Level = 160.00 m