Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B. Tech.**
PCI6I102

6th Semester Regular Examination 2017-18
IRRIGATION ENGINEERING
BRANCH : CIVIL
Time : 3 Hours
Max Marks : 100
Q.CODE : C211

Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.

Part – A (Answer all the questions)

Q1 **Answer the following questions : *multiple type or dash fill up type :*** **(2 x 10)**

a) The ratio of the quantity of water stored in the root zone of the crops to the quantity of water actually delivered in the field is known as ……

b) A canal which is aligned at right angles to the contour is called ….

c) Time between the first watering at the time of sowing and last watering before harvesting is called …..

d) The project of lining an unlined channel will be said to be economical when the benefit cost ratio for the project will be……..

e) The design of fish ladder is such that a velocity of maximum of …… is maintained to allow the fish to move upstream.

f) When the bed levels of the natural drainage is higher than that of the canal, the cross drainage work constructed is called ……..

g) According to Khosla's theory, the exit gradient in the absence of a downstream cutoff is …..

h) Hydrodynamic pressure due to earthquake acts at a height of ……. above the base.

i) In the earthen dam the ……..is the line within dam which separates the saturated or unsaturated zones.

j) Elementary profile of gravity dam is ……..

Q2 **Answer the following questions : Short answer type :** **(2 x 10)**

a) Name various techniques of water distribution in the farms commonly adopted in our country.

b) What do you mean by paleo?

c) What are the factors affecting duty?

d) How can you define a hydraulically and economically efficient channel?

e) State various types of lining commonly adopted.

f) What is meant by a true regime channel?

g) Why berms are provided in channels?

h) Name different forces acting on a gravity dam.

i) State various types of spillways.

j) What are the objectives of a diversion head work?

Part – B (Answer any four questions)

Q3 **a)** The gross area of an irrigation project is 60,000 hectares. Out of this, about 5000 hectares have been utilized for construction of dwellings roads, bridges etc. The area to be cultivated during Kharif is 28,000 hectares and during Rabi 30,000 hectares. The duty of canal water for Rabi crops is 5000 hectares per cumec and for Kharif crops is 3000 hectares per cumec. Find the design discharge for the canal after giving a 10% allowance for peak discharge and loss of water in transit. What would be the annual intensity of irrigation? **(10)**

b) Discuss the advantages and disadvantages of sprinkler irrigation over surface irrigation. **(5)**

Q4 **a)** Describe the important factors considered in fixing the alignment of a main canal. Explain the advantages of lining. **(9)**

b) What are the losses which occur in a canal? Discuss the factors affecting seepage losses. **(6)**

Q5 **a)** Design an irrigation canal in alluvial soil according to Lacey's silt theory: given lacey silt factor is 1.0, canal side slope is 1H:2V and full supply discharge is 10 m^3/s. **(9)**

b) Draw neat cross sections of a canal in (i) Cutting (ii) Filling (iii) Partial cutting **(6)**

Q6 **a)** Classify Head works. What are the various components of diversion head works? Draw a neat diagram and explain the functions of each component. **(10)**

b) Discuss various methods of reclamation of saline and alkaline lands. **(5)**

Q7 **a)** What are cross drainage works? What is the purpose of these C.D works? Describe the use of syphon in C.D works. **(10)**

b) Explain Lane's weighted creep theory with a suitable example. **(5)**

Q8 **a)** Classify high and low gravity dam. Derive an expression to the maximum height of a low concrete dam in terms of specific weight of water, specific gravity of concrete and allowable compressive stress of the dam material. **(10)**

b) What is morning glory spillway? Where it is suited the most? **(5)**

Q9 **a)** What are the various causes of failure of an earth dam? Explain with help of a neat sketches? **(10)**

b) Write short notes on stability analysis of gravity dam. **(5)**