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

Total Number of Pages : 02 **B.Tech.**
PCI6G001

6th Semester Regular Examination 2017-18
IRRIGATION ENGINEERING
BRANCH : CIVIL
Time : 3 Hours
Max Marks : 100
Q.CODE : C491

Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.
Answer all parts of a question at a place.

Part – A (Answer all the questions)

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

a) The kor depth for rice is 200 mm and kor period is 14 days. The outlet factor for this will be…..

b) The amount of irrigation water required to meet the evapotranspiration needs of the crop during its full growth is called……

c) A canal which closely follows the contour line of the land it traverses 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) Divide wall is built at an ……angle to the axis of the weir.

f) In case of non availability of space due to topography, the most suitable spillway is ……..

g) If h is the ordinate of hydraulic gradient line above the top of the floor and G is specific gravity of floor material, then the thickness of floor is given by the formula …….

h) Total force due to wave action on a gravity dam acts at a height of …….h_w(height of wave) above the reservoir surface.

i) The focus of base parabola for a dam having a horizontal drainage filter is at a distance of ……from toe.

j) For the upstream face of an earthen dam, the most adverse condition for stability of slope is ……

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

a) Differentiate between GCA and CCA.

b) Differentiate between base period and crop period.

c) How is the flow irrigation different from lift irrigation?

d) What is type-II aqueduct?

e) State various types of lining commonly adopted.

f) What are the equations used for calculation of wave pressure on concrete dam?

g) What are the factors to be considered for selection of a dam site?

h) Why it is advisable to limit the hydraulic gradient within exit gradient?

i) State various types of falls.

j) What are the main principle of Khosla's theory on seepage?

Part – B (Answer any four questions)

Q3. **a)** A water course command an irrigated area of 800 hectares. The intensity of irrigation of rice in this area is 50%. The transportation of rice crop takes 15 days and total depth of water required by the crop is 60 cm on the field during the transportation period, given that the rain falling on the field during this period is 15 cm. Find the duty of irrigation water for the crop on the field during transportation, at the head of the distributary, assuming losses of water to be 20% in the water course. Also calculate the discharge required in the water course. **(10)**

b) What is meant by duty? Enumerate the different terms by which duty can be impressed. **(5)**

Q4. **a)** Design an irrigation channel to carry a discharge of 40 cumecs at a slope of 1:4000. Take Kutter's N =0.0225 and m(critical velocity ratio) =0.9. **(9)**

b) What are the advantages of lining a canal? Briefly describe cement concrete type of lining. **(6)**

Q5. **a)** What do you understand by sub-surface irrigation? Describe it with the help of neat sketches. **(9)**

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

Q6. **a)** Sketch a typical layout of Diversion Head works. Explain the function of under sluices and its design considerations. **(8)**

b) Discuss Lane's weighted creep theory for the design of impervious floor on permeable foundation, How does it differ from Bligh's creep theory? **(7)**

Q7. **a)** What is super passage? Draw a neat sketch of a super passage? Explain in brief the design procedure. **(10)**

b) What is meant by falls? What are criterion for their location? **(5)**

Q8. **a)** What are the different ways by which a concrete gravity dam may fail? How will you ensure its safety against each type of failure? **(10)**

b) What are the different kinds of spillway and how are they selected for individual conditions? **(5)**

Q9. **a)** Draw suitably labelled neat sketches with different types of earth dam. How does an earth dam differs from a gravity dam. **(10)**

b) What do you understand by hydraulic gradient or seepage line? Explain on what factors the seepage control measures design depends? **(5)**