

VI Sem - Library
2015-2016

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester	: VI (New)	Term	: II	Academic Year	: 2015-16
Course No.	: IDE 366	Title	: Minor Irrigation and Command Area Development		
Credits	: 3 (2+1)				
Day & Date	: Monday, 25.04.2016	Time	: 09.00 to 12.00	Total Marks	: 80

- Note :
1. Solve ANY EIGHT questions from SECTION "A".
 2. All questions from SECTION "B" are compulsory.
 3. All questions carry equal marks.
 4. Draw neat diagrams wherever necessary.

SECTION "A"

- Q.1
- a) Explain hydraulic jump with the help of a neat sketch.
 - b) Derive an equation for the hydraulic jump using the momentum formula.
 - c) Classify the jump on the basis of Froude number.
- Q.2
- a) The CCA of a water course is 1200 hectares. The duty for crop 'A' (Rabi crop) at the head of the water course is 730 hectares/cumec and for crop 'B' (Kharif crop) is 1800 hectares/cumec. The irrigation intensity for crop 'A' is 20% and crop 'B' is 40% respectively. Estimate.
 - 1) Discharge requirement at the head of the water course.
 - 2) Design discharge requirement at the outlet, if the time factor is 0.8.
 - b) Derive the relationship between duty and delta. Also, determine the crop duty if its delta is 120 cm and the base period of the crop being 120 days.
- Q.3
- a) Design a trapezoidal shaped irrigation channel to carry 50 cumec discharge. The other details are:
 - 1) side slope- 0.5:1(H:V),
 - 2) bed slope -1 in 4000,
 - 3) critical velocity ratio -1.1 and
 - 4) Kutter's rugosity coefficient- 0.023.Assume other suitable data if required.
 - b) Compare the Kennedy's and Lacey's theory of irrigation canal design.
- Q.4
- a) Design concrete lined channel to carry a discharge of 350 cumec at a slope of 1 in 5000. The side slope of the channel may be taken as 1.5:1. The value of Manning's rugosity coefficient (n) for lining is 0.014. Assume limiting velocity in the channel as 2 m/sec.
 - b) Discuss the various advantages of canal lining.
- Q.5
- a) Explain Bligh's creep theory for seepage flow.
 - b) What are the different silt control devices used at the head works? Discuss in brief silt excluders.
- Q.6
- a) What is a canal fall? Enlist the different type of canal fall and state their adaptability.
 - b) Explain the Ogee fall with a neat sketch.

(P.T.O.)

- Q.7 a) What is meant by canal regulation works? Compare the functions of head regulator and cross regulator.
b) Enlist the requirements of a good module.
- Q.8 a) Explain the term flexibility and sensitivity for judging the module performance. Derive the relation between them.
b) Design a pipe outlet if:
1) Full supply discharge at the head of water course- 90 lps
2) FSL in distributary- 205 m.
3) FSL in water course – 204 m.
4) Cd= 0.62
Assume other data, if necessary.
- Q.9 a) Discuss the causes of failure of hydraulic structures?
b) Differentiate between gravity and non-gravity weirs.
- Q.10 Write short notes with a neat sketch on (Any two).
1) Fish ladder
2) Aqueduct and siphon aqueduct
3) Shejpal system of water supply

SECTION "B"

- Q.11 Fill in the blanks.
- 1) The nominal duty is the ratio of _____.
 - 2) If water consumed is more, duty will be _____.
 - 3) The minor has a discharge capacity less than _____ cumecs.
 - 4) _____ shaped channel sections are mostly adopted for small discharges.
 - 5) The rise in HFL upstream of the weir caused due to construction of weir across the river is called _____.
 - 6) _____ canals are parallel to the natural drainage flow and do not require cross drainage works.
 - 7) The time factor is the ratio between _____.
 - 8) _____ fall is suitable for all discharges when drop is more than 1.5m.
- Q.12 Define the following terms.
- | | |
|---------------------|----------------------------|
| 1) Paleo irrigation | 2) Intensity of irrigation |
| 3) Kor-watering | 4) Drowning ratio |
| 5) Crop period | 6) Culturable command area |
| 7) Delta | 8) Modular limit |

