MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester	: **VI (New)**	**Term**	: **II**	**Academic Year**	: **2016-17**
Course No.	: IDE- 366	**Title**	: **Minor Irrigation and Command Area Development**		
Credits	: 3 (2+1)				
Day & Date	: Thursday, 27.04.2017	**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) Enlist the different types of cross drainage works. Explain siphon-aqueduct with neat sketch.

b) Explain in brief, problems posed by irrigation canal and their remedial measures.

Q.2 Explain the term canal falls. Discuss in brief Montague type falls and compare different types of falls.

Q.3 a) Design a regime channel for discharge of 50 cumec and silt factor 1.1, using Lacy's Theory.

b) Enlist silt control devices and explain the principal of silt control. Discuss the major disadvantages of silt excluder.

Q.4 The cultivable command area for a distributory is 18000 ha. The intensity of irrigation for *rabi* (wheat) is 30% and for *kharif* (rice) is 25%. If the total water requirements of the two crops are 37.5 cm and 120 cm and their periods of growth are 170 days and 138 days respectively.

a) Determine the outlet discharge from average demand considerations.

b) Also determine the peak demand discharge, assuming that the kor water depth for two crops are 13.5 cm and 19 cm and their kor periods are 28 days and 14 days respectively?

Q.5 a) Explain in brief Lane's Weighted Creep Theory with diagram.

b) Design a concrete lined channel to carry a discharge of 350 m^3/ sec at slope of 1 in 5000. The side slopes of the channel may be taken as 1.5:1. The value of n for lining is 0.014. Assume lining velocity in the channel as 2 m/sec.

Q.6 Design an irrigation channel to carry 50 cumec of discharge. The channel is laid at a slope of 1 in 4000. The critical velocity ratio for the soil is 1.1. Use Kutter rugosity coefficient as 0.023.

Q.7 a) Enlist the types of canal alignments and explain in detail canal alignment which is used in hilly areas.

b) Which precautionary measures are to be undertaken for improving duty of water in canal command area?

(P.T.O.)

Q.8 a) Discuss duty at various places in large canal irrigation system.

b) Discuss in brief, factors on which duty depends.

Q.9 a) What are the main functions of head regulators and cross regulators?

b) Design a pipe outlet for the following data.

i) Full supply discharge at the head of water course = 80 lit/sec.

ii) FSL in distributory = 203.00 m.

iii) FSL in water course = 202.00 m.

Q.10 a) Explain hydraulic jump with specific energy curve.

b) What are the requirements of good modules? Discuss submerged pipe outlet?

SECTION "B"

Q.11 Fill in the blanks.

1) Dunes are much longer in length and huge and more rounded than_____.

2) In storage irrigation, quantity duty may be expressed _____of available water.

3) A siphon is the reverse of an_____.

4) The distributory canal has discharge capacity less than _____ cumec.

5) Most of the kinds of fish can travel upstream against a flow velocity of about _____.

6) Silt extractor is costly than_____.

7) The base period is slightly less than_____.

8) For no jump, Froude number is _____.

Q.12 Define the following terms.

1) Canal regulation work
2) Paleo irrigation
3) Watershed canal
4) Hydraulic jump
5) Nominal duty
6) Fish ladder
7) Sediment load
8) Silt ejector

✧ ✧ ✧ ✧ ✧ ✧ ✧ ✧ ✧ ✧ ✧