

ARUNACHAL PRADESH PUBLIC SERVICE COMMISSION ITANAGAR

SUBJECT: AGRICULTURAL ENGINEERING

Time: 03 hours.

Full Marks: 200

Note: Question No. 1 is compulsory and any four from the remaining seven questions. All question carry equal makrs.

Q.1 Attempt any 10 (ten)

10 x 4 = 40

- A. Why a statter is needed for a AC motor?
- B. What do you mean by 'homogenization' of milk?
- C. what are steps involved in manufacturing of ice cream?
- D. What is the difference between 'Potential Evapotranspiration' and 'Reference Crop Evapotranspiration'?
- E. What are the factors which affect the infiltration rate of water into soil?
- F. What are the steps involved in the design of tube well?
- G. Why tractor engine has a governor? How a tractor engine differs from a car engine with respect to governor?
- H. When do you recommend contour and graded bund?
- I. How a disc plough differs with mould board plough in principle?
- J. How does sprinkler irrigation differ from trickle irrigation?
- K. State various harmful effects of water logging on crops.
- L. what is gasifire? Whar are the gases obtained during gasification in gasifire?

Q.2 Attempt any 8 (eight)

8 x 5 = 40

- A. Differentiate between Octane number and Cetane number.
- B. Why does a tractor need clutch ? What are essential features of a good clutch ?
- C. What is the difference between disc angle and tilt angle?
- D. What is slump test on concrete? What is its significance in building construction.
- E. What are the different types of irrigation scheduling?
- F. Define the terms 'standardization' and 'skimming efficiency'.
- G. What are the advantages of parboiling the paddy?
- H. What are the factors which causes spoilage of food during storage? How is spoilage of food prevented during storage?
- I. Discuss the working of Deen Bandhu bio gas plant using suitable sketch.
- J. When do you recommend biological measures for soil conservation? Distinguish between field strip cropping and buffer cropping.

Q.3 Attempt any 5 (five)

5 x 8 = 40

- A. With the help of neat diagram, explain the working of centrifugal pump
- B. How evapotranspiration is measured in field using lysimeter?

- C. Define the term 'Agricultural Drainage'. Name and discuss different surface and sub-surface drainage system.
- D. Give the mathematical expressions for measurement of water flow by orifice (submerged and free flow), trapezoidal weir, 90° V notch and rectangular weir with appropriate sketches.
- E. Define the term 'water harvesting'. What are the various techniques of water harvesting?
- F. What do you understand by registration of Alignment of mower?
- G. What are different types of nozzle used in sprayers? How they differ from each other?

Q.4 Attempt any 4 (four)

4 x 10 = 40

- A. Discuss the properties of concrete and curing process.
- B. What is litter type poultry house? What advantage it got over cage house?
- C. What is seed drill and what are the functions of a seed drill?
- D. Why should milk be pasteurized? Explain the working of HTST pasteurizer.
- E. Discuss various factors which affect the generation of biogas production.

Q.5 Attempt any 2 (two)

2 x 20 = 40

- A. What are problems associated with post harvest technology in the rice industry. Discuss them.
- B. Discuss working of huller. Also discuss advantages and disadvantages of huller.
- C. Discuss influence of moisture content, relative humidity, temperature and storage fungi on stored seed.

Q.6

40

Explain the term watershed management. Describe its investigation, implementation, selection of priority areas and also provide watershed work plan.

Q.7

40

Derive the curve number equation used for the determination of excess runoff from its basic principle? Also discuss its limitation.

Q.8

40

Find the cost of using a tractor per hp-hr when the cost of 35 hp tractor is 10 yr. Rate of interest is 10% and working hrs per year is 1000 hrs. Assume necessary data if not given