

FS – 6 / 15-16

Agricultural Engineering

Paper – II

Time : 3 hours

Full Marks : 200

The figures in the right-hand margin indicate marks.

*Candidates should attempt Q. No. 1 from Section – A and Q.No. 5 from Section – B which are compulsory and any **three** of the remaining questions, selecting at least **one** from each Section.*

SECTION – A

1. Answer any **two** of the following out of (a), (b) and (c) : $20 \times 2 = 40$

(a) Compare two and four stroke-cycle engines on the basis of efficiency, power, utility and simplicity in design.

(b) Calculate the weight of fuel per kW-h of a diesel engine that has the following specification :

(i) Compression ratio = 14 : 1

- (ii) Fuel is cut off at 0.08 of the stroke
- (iii) Relative efficiency = 52%
- (iv) Calorific value of fuel = 10,000 kcal/kg
- (c) What are the factors affecting traction ?
Define traction efficiency, coefficient of traction, rolling resistance, slip and rim pull.
2. (a) Compare different harvesting methods/ machines indicating brief description, advantages and disadvantages. 20
- (b) What are the different types of sprayers ?
Describe the working of Knapsack type sprayer with the help of a neat sketch. 20
3. (a) Give an account of energy requirements of agricultural operations including agro-processing. 20
- (b) Explain the selection, installation, safety and maintenance of electric motors used in agriculture. 20
4. (a) What are the advantages and salient features of *Pneumatic Seed Drill* and *Zero Till Seed Cum Fertilizer Drill* over the conventional seed drill ? 20

(b) Differentiate between the following :

4×5 = 20

- (i) Primary and Secondary tillage tools
- (ii) Trailed, Semi-mounted and Mounted implements
- (iii) Fixed type M. B. plough and Turn wrest plough
- (iv) Disc plough and M.B. plough
- (v) Spring loaded cultivator and Rigid tined cultivator

SECTION – B

5. Answer any **two** questions of the following :

20×2 = 40

- (a) Describe various unit operations in Agricultural Processing.
 - (b) Explain the main features and important components of seed processing plant.
 - (c) Explain the various engineering properties of agricultural produces and by-products, affecting its handling and processing.
6. (a) What are the important considerations in processing of milk and dairy products ?
Explain in detail. 20

(b) What is Homogenization and Sterilization ?

Describe the purpose and methods of homogenization in brief. (i) 20

7. (a) Differentiate between sequential and combinational circuits with an example. (ii) 20

(b) Explain, in brief, different types of sensors/transducers used for measurement of temperature. 20

8. (a) Explain primary and secondary memory devices in detail. 20

(b) Write short notes on any **four** of the following : 5×4 = 20

(i) Flow Chart

(ii) Multimedia

(iii) Hardware and Software

(iv) Computer Networks

(v) Applications of Computer

