IMPORTANT NOTES

(A) Please fill up the OMR Sheet of this Question-Answer Booklet properly before answering.

(B) The question paper is divided into different unit and parts. The number of questions to be attempted and their marks are indicated in each unit and parts.

(C) Attempt answers either in Hindi or English, not in both. For Language Papers, answer in concerned language and script, unless directed otherwise to write in Hindi or English specifically.

(D) The candidates should not write the answers beyond the prescribed limit of words; filling this, marks will be deducted.

(E) Please write answers only in the prescribed space of booklet. Do not write any mark of identity inside the Answer Script (including Paper for rough work) i.e. name, address, telephone number, Name of God etc. or any irrelevant words other than the answer of question. Such act will be treated as unfair means. The Commission also may deduct 5 marks from the marks obtained, if Roll Number is not filled correctly on the OMR Sheet.

(F) Candidates are directed that they should not write (answer) out side the border line in every page. Answer written out side the border line will not be checked by the Examiner.

(G) It should be ensured that the Question-Answer Booklet is provided in a sealed envelope to the candidate.

(H) This OMR Sheet consists of Two parts, in which some information is pre-printed; remaining details have to be filled by the candidate.

Special Notes:
If there is any wrong information filled by the candidate or any attempt is made to damage it or any marking as identification is done, then his candidature for the entire examination shall be rejected by the Commission, for which he will be liable.
SECTION - A

Note: Each question carries 2 marks. All questions are compulsory. The section comprises of 20 questions. Answer should not exceed 15 words.

1. What are specific aims of Farm Mechanization?

2. Differentiate between IHP and BHP.

3. Write two advance features of modern tractors.

4. What are the functions of a carburettor?
5. What is the material of construction of a future tractor engine for operation at higher temperature and for higher thermal efficiency?

6. Differentiate between specific heats at constant volume and constant pressure. Which one is higher and why?

7. Write three measures through which safety of agricultural machines can be improved.

8. What is the characteristic difference between on-highway and off-highway vehicles?
9. What is the specific role of Phase Change Material (PCM) in Solar dryers?

10. Write two main advantages of CFTRI method of parboiling of paddy.

11. What is the measure of rural electrification? How does India compare with China and Pakistan in this regard?

12. What are three main crop residue sources suitable for energy generation?
13. What is cone index? How is it measured?

14. What is electrostatic cleaning?

15. What is the role of a swirl plate in a nozzle?

16. Write importance of tappet clearance.

17. What happens if the thermostat in the cooling system gets struck?
18. List the advantages of KVIC plant design over fixed dome type biogas plant design.


19. What are the stages of gasification process?


20. What are the advantages of lubrication system?
SECTION – B

Note: There are 12 questions in this Section. Each question carries 5 marks. Attempt all questions. Answer should not exceed 50 words.


22. What are the advantages and disadvantages of wind power?
23. Differentiate between hot spark plug and cold spark plug.

24. What is functioning and advantages of governor in a tractor system?
25. Calculate the time required for ploughing of 15 ha of land by a 2-bottom, 50 cm MB plough. Assume tractor speed as 4.5 kmph and time lost in farming is 8 percent.

26. What are the main functions of flywheel in IC engines?
27. Differentiate between VMD and NMD. Explain with illustrations.

28. List the machine related factors, and explain briefly, which affect seed germination and emergence; in case of a seeder/planter.
29. Briefly discuss about working sunshine recorder.

30. Calculate total time required to harvest 2.5 hectare of grass by means of 2 m mower being operated at a speed of 4 kmph. Given that field efficiency of mower is 80 percent.
31. What is gasifier? Explain in brief about different types of gasifier commonly used.

32. Write in brief about different types of farm fencing.
SECTION – C

Note: All questions are compulsory. Each question carries 20 marks. Answer should not exceed 200 words.

33. With a neat sketch of valve fencing diagram, explain the valve overlap during the end of exhaust stroke and in the beginning of the intake stroke.
34. A 4.5 m grain combine is used at a forward speed of 3.5 kmph for harvesting of wheat crop. Grain collected in the tank for 100 m² run is 40 kg. Material left over shoes is 15 kg, over rack is 20 kg, free grain over rack is 100 g, unthreshed grain over rack is 120 g, unthreshed grain over shoe is 130 g and free grain over shoe is 410 g. Calculate feed rate, net yield, gross yield, percent of Shaw and Chaff retained on rack and all other losses.
35. (a) Design an appropriate size of biogas plant for a family of 6 members owning 2 Cows, 2 Buffaloes and 2 Calves. One candle lamp is used for lighting purpose for two hours per day. Make appropriate assumption.
(b) Find draft, side draft and vertical component of pull of 12 kN when line of pull makes 20° angle with horizontal and lies in vertical plane inclined at 15° with direction of motion. Also find the drawbar power required for pulling the implement at a speed of 3.5 kmph.
36. What is farmstead planning? What factors are to be considered for selection of location of farmstead? Write in brief about size and arrangement of farmstead.
37. (a) Give a Schematic diagram and explain motion and vibration at tractor operators seat.
(b) A four cylinder 4-stroke gas engine has cylinder diameter of 20 cm, stroke-bore ratio is 1.5; clearance volume 2500 cm³, engine speed 300 rpm, mean effective pressure 600 kPa and mechanical efficiency 70%. Calculate IHP, BHP, compression ratio and swept volume.