2019

B.Tech Even Semester (CBCS) Exam., May—2019

AGRICULTURAL ENGINEERING

(4th Semester)

Course No. : AECC–13

(Farm Power)

Full Marks : 50
Pass Marks : 15

Time : 2 hours

Note :
1. Attempt *any* **five** questions.
2. Begin each answer in a new page.
3. Answer parts of a question at a place.
4. Assume reasonable data wherever required.
5. The figures in the right margin indicate full marks for the questions.

1. *(a)* Explain different sources of farm power. Give details of renewable energy. 6

(b) What is valve timing? Explain with suitable diagram and state what is valve overlapping. 1+3

2. *(a)* With neat sketch, explain two-stroke SI engine. 5

(b) A single-cylinder, 4-stroke diesel engine having speed of 2000 rpm, inlet valve opens 20° before TDC and closes after 35° BDC and exhaust valve opens before 25° BDC and closed after 15° TDC. Calculate how much time valve overlapping happens per cycle in seconds. 5

3. *(a)* What is stoichiometric air-fuel ratio? Calculate step-by-step correct A/F ratio of butanol (C_4H_9OH). 1+5=6

(b) Define octane and cetane rating. 2+2=4

4. *(a)* A four-cylinder, four-stroke compression ignition engine has a stroke-bore ratio of 0·96. The total swept volume of the engine is 4000 cm^3 and the clearance volume per cylinder is 62·5 cm^3. At a mean piston speed of 7·5 m/s, 40 kW power is produced. Determine—
(i) the engine compression ratio;
(ii) the brake mean effective pressure. 7

(b) Discuss turbocharger with neat sketch. 3

5. *(a)* Explain different components of a two-stroke engine. 5

(b) Explain with neat sketch, a four-stroke engine overhead valve mechanism. 5

6. *(a)* Explain fuel supply system of diesel engine in detail with a neat sketch. 6

(b) Explain any governor system of a tractor. 4

7. *(a)* Explain water cooling system of tractor with neat sketch. 7

(b) What is firing order? Explain the need and give the order for 4-cylinder engine. 3

8. *(a)* Explain battery ignition system with a neat sketch. 7

(b) What are the functions of lubrication system? 3

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