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# Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

## VII SEMESTER B.TECH (AUTOMOBILE ENGINEERING)

### END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: EARTH MOVING EQUIPMENTS AND FARM MACHINERY

[AAE 473]

#### REVISED CREDIT SYSTEM

Time: 3 Hours

(06/01/2017)

MAX. MARKS: 50

#### Instructions to Candidates:

- ❖ Answer **ANY FIVE FULL** the questions.
- ❖ Missing data may be suitable assumed.

- 1A. How the tractors are classified? List various applications of tractors. (03)
- 1B. With a neat sketch, explain the working of a pressurized lubrication system used for I C engines (04)
- 1C. Illustrate the power transmission system of a bull dozer with a relevant diagram. (03)
- 2A. What are walking type of tractors? Explain the features of such machines (03)
- 2B. What is a scraper? Explain the features of bowl and apron in a scraper. (03)
- 2C. With a neat sketch, illustrate the hydraulic circuitry involved in actuating the implements in tractors. (04)
- 3A. What are the factors that affect the performance of a loader? (03)
- 3B. With a neat sketch, explain the essential features of a grader. (04)
- 3C. What is an excavator- loader? Discuss the principle of working of such equipment. (03)
- 4A. What are turbo chargers? How do they improve the performance of engines? (03)
- 4B. With a neat sketch, explain the essential features of a disc plough used on tractors. (04)
- 4C. What is tillage? Explain the features of a blade harrow. (03)
- 5A. What are the uses of jointers and gauge wheels in tractors? (04)
- 5B. What are the advantages and disadvantages of mould board plough? (03)
- 5C. Determine the horse power required to pull a four bottom 32 cm plough, working to depth of 14 cm. The tractor is operating at a speed of 5.5 kmph. The soil resistance is  $0.8 \text{ kg/cm}^2$ . (03)
- 6A. What are cranes? Explain the features of a tower crane. (03)

- 6B.** Calculate the cost of operation of a 40 HP tractor per hour and HP hour. **(04)**  
Initial cost is Rs. 600,000-00, life of the tractor is 10 years, number of working hours are 1300 per year, interest on the capital is 10%, cost of the diesel is Rs. 68 per litre, fuel consumption is 5 litres per hour, wages of the driver is Rs. 50,000/ year , lubricants cost is 35% of the fuel cost, repairs and replacements is 10% of initial cost; housing, taxes and insurance is 1.5% each of the initial cost.
- 6C.** Write short notes on (i) power shovels (ii) cultivators **(03)**