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**MANIPAL INSTITUTE OF TECHNOLOGY**  
**MANIPAL**

*A Constituent Institution of Manipal University*

**VII SEMESTER B.TECH. (AUTOMOBILE ENGINEERING)**

**MAKE UP EXAMINATIONS DEC/JAN 2017-18**

**SUBJECT: PRODUCT DESIGN AND MANUFACTURING [AAE 4029]**

**REVISED CREDIT SYSTEM  
 (02/01/ 2018)**

Time: 3 Hours

MAX. MARKS: 50

**Instructions to Candidates:**

- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitable assumed.
- ❖ Draw sketches in pencil only

- 1A.** Explain why strength is considered as an important factor in the design process. Discuss with neat sketch how design is balanced in case of 'C' clamp? **(05)**
- 1B.** What is ergonomics? Highlight some 'typical' ergonomic problems found in the workplace. Discuss any five of them with solution. **(05)**
- 2A.** Explain with schematic diagram and suitable example concept generation process. **(05)**
- 2B.** Design is an iterative process in nature. Explain the process with suitable example and schematic sketch. **(02)**
- 2C.** Sketch and explain 3-2-1 locating principles. **(03)**
- 3A.** Explain with neat sketch producibility requirements meant for design of machine parts and machining techniques. **(05)**
- 3B.** What is optimization? Discuss the role of linear programming in optimization with suitable example. How problem formulation or modeling is accomplished in linear programming method of optimization. **(05)**

- 4A.** Enumerate six important measures to prevent buckling of tube in bending and torsional load. **(03)**
- 4B.** Explain brainstorming exercise and its relevance in product design. **(02)**
- 4C.** A jewel box is to be constructed as per the fig no 4C of material that costs Rs100/- per square inch for the bottom, Rs 200/- per square inch for the sides, and Rs 500/- per square inch for the top. If the total volume is to be 96 inch, what dimensions will minimize the total cost of construction? **(05)**

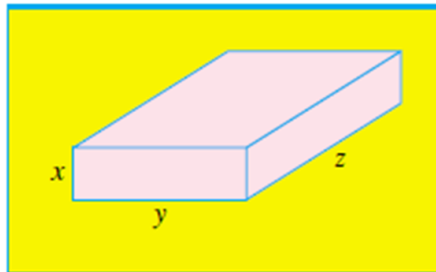


Fig 4C

Find the solution by Lagrange multiplier method

- 5A.** What is the role of ribs and corrugations in product design process. Explain with neat sketch different design and manufacture method of corrugations. **(05)**
- 5B.** Illustrate design by evolution and design by innovation with suitable example. **(02)**
- 5C.** Standardization covers a wide field of activity. Identify and illustrate five important activity with suitable example. **(03)**