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Reg. No. :

Name :

SECOND SEMESTER B.TECH. DEGREE EXAMINATION, MAY/JUNE 2016
BE 102 : DESIGN AND ENGINEERING

Max. Marks : 50

Duration : 2 Hours

Instructions: Answer **all** questions; this is an open book examination and the students are **permitted** to use text books, class notes, own notes, earlier assignments; but access to mobile phone and internet is **not allowed**.

PART – A

Each question in Part **A** carries **5** marks.

1. In an ordinary bicycle, name at least 6 parts that are not made of metal. Sketch any one of these parts.
2. How modular design is realized in i) Umbrella and ii) Ink Pen ? Draw the different modules involved in each of these products.
3. Design of a chair with steel tube is shown in Figure. The seat and the back rest are made of wood and are screwed on to the steel frame. Identify the interesting aspect of this design and list the number of different parts used for the chair.

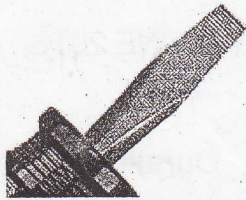


4. Devolve a questionnaire for user centered design for an automobile.
5. Considering the principle of value engineering, design a suitable product for easy cleaning of dust from windows, fans and lamp shades.

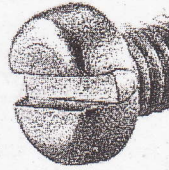
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6. Sketches of a screw driver and a normal screw head are given below :



SCREW DRIVER

↑
SCREW HEAD

This screw could be tightened or loosened using the screw driver. Now design the head of such a screw that could only be tightened but not loosened by this screw driver.

PART – B

Each question in Part **B** carries **10** marks.

7. Without using an air-conditioner, blower or exhaust fan, design a natural system of heat removal from the rooms of a building and simultaneous inflow of fresh air from outside into the room. Prepare the necessary sketches and justify your answer.
8. Develop and sketch anyone design concept of a mechanical system to drive a generator for energy harvesting by exploiting heavy traffic.
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