

10202

Reg. No: \_\_\_\_\_

Name: \_\_\_\_\_

APJ ABDUL KALAM TECHNOLOGICAL U  
SECOND SEMESTER B. TECH. DEGREE EXAMINATION, JULY 2016

**BE 102: Design and Engineering**

Duration: Two hours

Maximum mark: 50

*(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. Four different design of drinking water glasses (i.e., Glass A, B, C, and D) are shown below. Discuss the merits and demerits of each of these four designs.



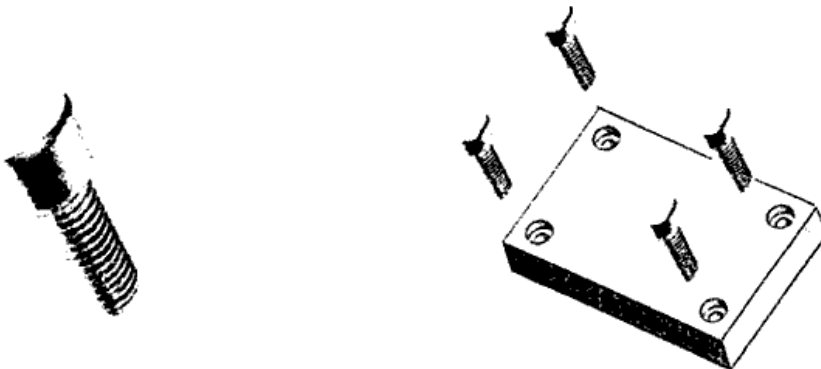
a. Glass A

b. Glass B

c. Glass C

d. Glass D

2. Figure given below shows a screw with a cylindrical head. Modify the design of the screw head so that the screw could be tightened even when it is sunk in the hole as shown.



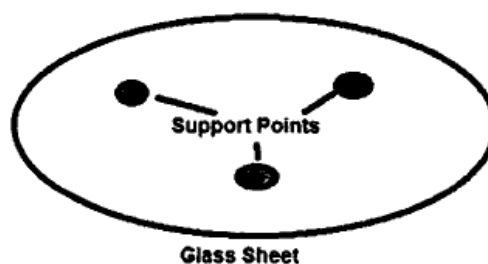
3. Discuss briefly any five "X" to be considered in the design for "X" of a bag to make it competitive in the market.
4. Identify all the possible customers of a washing machine and prepare questionnaires for each group in order to collect customer requirements.
5. Develop and sketch a new design for a hand held remote control for household equipments which is ergonomically and aesthetically better than conventional one.
6. Design a quick removable handle for the mug shown.



**Part B**

*(Each question in Part B carries 10 marks)*

7. A round glass of 600 mm diameter and 6 mm thick is available. This is to be designed as a table supported at three points by a steel tube bent in any convenient way. The height of the table is to be 300 mm and the total length of the tube used should not exceed 1.8 m. The tube should not be cut or joined. Design the bent tube for supporting the table.



8. Public taps are now fitted with electronic sensors for hands free operation. Sketch the Design concepts of an automatic hands free flushing system for use in toilets. The system should be purely mechanical without any electronic circuits.