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

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

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY  
SECOND SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019

Course Code: BE102

Course Name: DESIGN AND ENGINEERING

Max. Marks: 50

Duration: 2 Hours

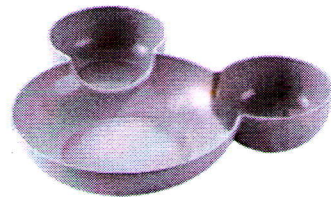
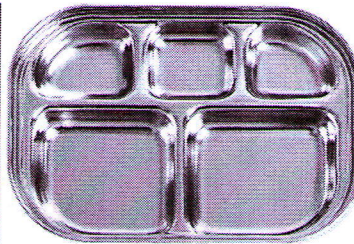
**Instructions:** *This is an open book examination and the students are permitted to use maximum of 4 text books, class notes, own notes, earlier assignments; but access to mobile phone and internet is not allowed. Exchange of text books/notes not permitted.*

### PART A

*Answer any 6 questions, each carries 5 marks*

1 Give the main objective and constraints of a train door and a bus door as applicable for aged person (>70 years). (5)

2 Write any five points comparing the designs of food plates shown below



(5)

3 Sketch a traditional steel folding chair and identify its parts. Identify any 3 'Design for X' for the folding chair. (5)

4 Prepare a feedback questionnaire with minimum eight questions for a new school bag introduced in the market. (5)

5 Make a creative design for a water bottle for school kids. (5)

6 Identify all parts of a cycle. List the standard parts. (5)

7 How is modular design realized in a shoe? Draw the different modules involved in the products (5)

8 Considering the principle of value engineering, design a suitable product for easy cleaning of dust from the chalkboards in a classroom. (5)

### PART B

*Answer any 2 questions, each carries 10 marks*

- 9 a) Present the major constraints faced by rescue workers for emergency patient handling during accidents in crowded areas or natural calamities. Present the key objectives of your design. (2)
- b) Design a mobile transport device to carry emergency patients. Give the advantages of your design and make a comparative analysis (8)
- 10 a) Develop a suitable problem statement concerning management of solid waste in hospitals. Present the key objectives of your design. (2)
- b) Propose a solution for effective waste collection (food waste, plastic and medical waste) and safe disposal of the collected waste. Give the advantages of your design and make a comparative analysis (8)
- 11 a) Highlight the major difficulties faced by disabled persons while travelling in trains. (2)
- b) Draw neatly labeled sketches of design modifications that can be done to solve any two such problems. (8)

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