MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY BHOPAL
Department of Mechanical Engineering
Mid Term Examination September 2024
Fundamentals of Design (ME 252)

Total time: 90 mins   Total Marks: 20
- This question paper has **5 questions**. Answer all the questions.
- Keep your answers short and crisp.

1. SOLVO, an automotive giant is planning to enter the EV market. Their corporate summarized a recent market survey as follows   **(3)   [CO 1,2; BT 3]**

"With increasing sustainability concerns, electric vehicles (EV) are emerging as a desirable means of transport in place of the conventional internal combustion engine vehicles. As compared to the IC engine vehicles, EVs provide instant acceleration, smooth torque, improved efficiency and smoother ride. In spite of several advantages there is limited adaption of EVs due to its limited battery range and durability, insufficient charging infrastructure and higher upfront costs. Further various parts of EV are made from hazardous chemicals with limited recyclability which restricts various countries to adapt it."

From the knowledge gained in this course till now and taking into account the current scenario as summarized above, **suggest** any two aspects that SOLVO should consider before launching its first product.

2. Imagine you are designing a new cup for a café. Draw 8 different versions of the cup that addresses different needs or styles (e.g. portability, elegance, etc.) and explain in 1-2 sentences how each design meets a specific user need.

(3) [CO 4, 5; BT 3]

3. Design the User Interface of a Mobile Application for managing the communication system of NIT Bhopal as per the following guidelines:

<u>Objective</u>: Create a user-friendly interface that facilitates direct communication between students and management, as well as allows faculty to post suggestions, coursework, attendance, and other important information.

<u>Requirements:</u>

I. Design a mobile application interface:
   - Create a realistic paper design layout for both students and faculty on a 3 inch X 2 inch interface.
   - Include 5 distinct blocks for each user type on a mobile screen (5 for students and 5 faculties). These blocks should represent different functionalities or sections of the app (e.g., messages, announcements, coursework, attendance, suggestions). Make in the form of chronological order of the usage.
II. Provide a brief explanation.   **(5) [CO 4, 5; BT 3]**

Note: Focus on clarity and usability in your designs, making sure the layout is intuitive for both students and faculty.

4. Following are shown 4 daily use things. Indicate   (5) [CO1; BT3]

    (a) Which of them are badly designed.

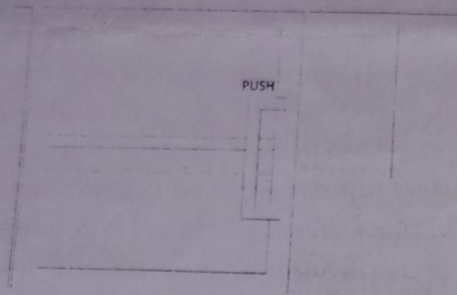   (b) What attribute in these poorly designed things will lead to frustration of a user?
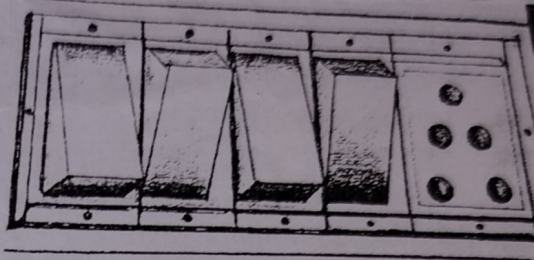

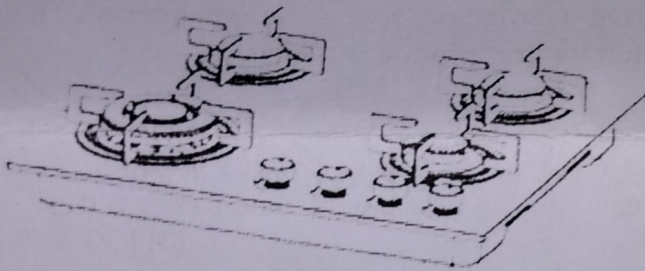**Figure 4.1: A Resturant door**

Figure 4.2: A switch board

Figure 4.3: A multi burner cooking stove
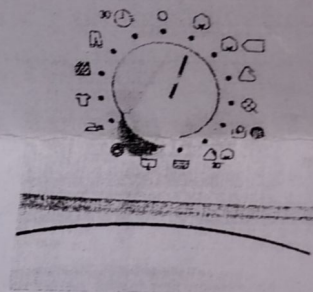

Fig. 1.4: Washing Machine Control

5. Give any two differences between following terms   (4)

(a) Brainstorming vs Brainwriting   [CO3; BT2]

(b) Design Thinking vs Conventional Thinking   [CO2; BT2]

(c) Adaptive Design vs Re-design   [CO1; BT2]

(d) Engineering vs Design   [CO1; BT2]