MICROPROCESSOR BASED PROJECT DESIGN

These are the basic steps to follow when doing a project in producing a product based on microprocessor system. There are a lot of other things and details to include, but this would help to see how the stages of the work should be carried out.

1. **Problem Statement / Product Planning / Requirement Definition**
   The requirement for a particular product (project) begins with the problem statement or planning to produce a new product or to modify an existing product. The product requirements specification is prepared by describing what the product should be capable of doing. Thus, the aim of the product is established. The result of these is to produce a proposal of the project, which contain the block diagram of the product, how the product will operate and what will be the benefits of using the product.

2. **System Design**
   The persons involved in the project analyze the product requirements to ensure that the product is feasible and proceeds to make the critical design decisions. Information on the project is collected through the internet, books, magazines etc. and discussed thoroughly. The decision among others is to choose the best functional circuit design, the cheapest and simple to operate finished product. The design is then finalized. If second opinion is required, then a person who is knowledgeable is consulted. The complete circuit is drawn using standardized format, or can be easily done using software packages such as ExpressPCB.

3. **Implementation**
   In order to achieve the above design objectives, the concept of modularity is adopted. Testing smaller units is much easier since each unit has its own specific set of functions. All electronic circuitry should be built on a Printed Circuit Board (PCB) since it has many advantages as compared to other techniques: prototyping-board, breadboard, wire-wrap.

   **Interfacing Problems**
   The design may be expected to work but when implemented using real devices, it may work marginally, or not at all. Therefore, a timing analysis (signal analysis) has to be performed to find out the problem. Real world phenomena like noise can cause improper operations and memory errors. Static charges and ringing can damage components.

4. **Testing and Debugging**
   Both hardware and software parts are developed separately in parallel, but are tested by the design groups separately. Again modularity will help a lot in achieving a functional product.

5. **Documentation and presentation**
   Prepare simple to understand user manual, which guide the user to using the system. Prepare full report on the work done and the product itself. Prepare presentation slides for presentation to the panel of evaluators.