Product Development Fundamentals.

1. Product Design Sections :

a.	Electronic Engineering	Circuit Design, PCB Design, EDA.
b.	Mechanical Engineering	CAD, Tool and Die Design, Enclosure
c.	Software Engineering Firmware	PC ware, CASE, emulators.

2. Methods of Product Design :

a.	Design Automation.	Design and Simulation with Computer.
b.	Computer Aided Design	Design on Computer, Breadboard test.
c.	Conventional Design.	Paper design with Breadboard test.

3. Criteria of Product Design :

a	Ergonomics	User friendly Interface of controls, display, etc..
b	EMI / RFI Ext.	Immunity to external electrical disturbance.
c	EMI / RFI Int.	Reduction of Internal electrical noise generation.
d	Input Cost	Selecting Cost effective components and methods.
e	Product Safety	Eliminating shock hazard, fire hazard or stress.
f	Corrosion res.	Resistance to Chemical Fumes, brine, gases etc..
g	Reliability	Long Life reliability engineering, MTBF, stability.
h	Serviceability	Accessibility − Maintenance and repairs, Self test.
i	Vibration	Enclosure / Components to be vibration resistant .
j	Ease of Manfr.	Manufacture ease and provision for test and Calib..
k	PC Interface	RS232, GPIB, etc. for PC Control and recording.
l	Upgrade Ease	Options, Software change, Hardware upgrades.
m	Quality	Design, Components, Production methods.
n	Accuracy	Specifications of performance and its stability.
o	Misuse−Abuse	Rugged design both electrically and mechanically.

4. Criteria of Circuit Design :

a	Technologies	Time proven technology and Standard Parts.
b	Reliability	Component Selection and Design Methods.
c	Modular	Allow for incremental upgrades and Service.
d	Safety Margins	Overrating for Voltage, threshold, speed, etc..
e	Testability	Test Points, Isolating Jumpers, self test mode.
f	Isolation	High voltage isolation, User safety, grounding.
g	Thermal Limits	Dissipation Limit, Heatsinks, Shutdown, Size.
h	Protections	Fuses, Current Limit, Zeners, Varistors, Alarm.
i	Power economy	CMOS Designs, LCD Designs, SMPS, Portable.
j	Electrical Parts	Connector selection, Relays, Switches, PCB.
k	Precision	Accuracy, Resolution, Drift, Thermal stability.

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