Structured Hardware Design

A design is required for an electronic system to collect votes from the audience in a television game show. Each of up to 1000 seats in the audience will have an audience station and there will be a master station for the floor manager. Output from the system will be video and this will feed monitor displays in the studio and be included in the broadcast programme.

(a) Sketch a block diagram of the overall system, showing clearly the various units and the signals which make up the cables which run between them. [5 marks]

(b) Specify the controls and indicators on the front panel of the two types of station. Give a pair of state diagrams of the system, one as seen by the audience and the other as seen by the floor manager. [5 marks]

(c) Given that a profitable return on the sale of three complete systems is required, describe the components and technology that should be used in the units. [5 marks]

(d) Discuss the advantages and disadvantages of including a PC inside the floor manager’s station, in terms of cost, ease of use and whether a custom or standard operating system should be used. [5 marks]