Fire scenarios to be studied Each student needs to complete the following tasks: 1. CFAST is a zone model that divide the compartment into two control volumes, a relatively hot upper layer and a relatively cool lower layer, please derive the system of ordinary differential equation for the compartment pressure. Each student shall use CFAST to simulate the impact of fires and smoke in the building environment for 10 minutes duration. The smoke layer height, smoke temperature and gases concentration of the fire compartments shall also be reported. (30 Marks) 2. Each student shall also use the Fire Dynamics Simulator (FDS) to predict the following for 10 minutes duration: (40 Marks) Temperature distribution; CO concentration; Soot visibility distribution; Radiation heat flux along the egress route. 3. Please propose the smoke extraction system with recommended flowrate to extent the ASET of the shopping mall. (30 Marks) Remarks x y Not to scale Page 4 of 4 Each student shall: state the assumptions, state boundary conditions, state approaches; reporting the simulation results and related screenshots captured in Smokeview for each fire scenario; maximum 30 pages and printed on both sides. Marking Criteria for Assignment The submitted assignment will be marked according to the following criteria: Questions Marking Allocation Marking Criteria Q1 30 Demonstrate both understanding and application of CFAST and evaluative skills on the fire and smoke development for the designed fire scenario. Q2 40 Demonstrate the use of FDS with fire engineering knowledge and relevant material. Assumption shall be made with appropriate supporting materials like guidebook, journal paper and etc. Q3 30 Application of fire safety measures like the smoke extraction system for fire safety level enhancement with FDS results.