PAPER 11, S/W ENGINEERING & DESIGN: MARKING GUIDE

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PART (A) ONE MARK EACH FOR ASSOCIATING CORRECT EFFECT WITH EACH, ONE MARK FOR DESCRIBING A PLAUSIBLE MECHANISM (EXPECTED ANSWERS: CHANGES TO FUNCTIONAL SPEC, RESPONSE SPEED). [TOTAL 4]

PART (B) ONE MARK (x2) FOR NAMING SUITABLE MEASUREMENT TECHNIQUE, ONE (x2) FOR DESCRIBING HOW IT WOULD WORK [TOTAL 4]

PART (C) FOR EACH (**) ONE MARK FOR DESCRIBING ANOTHER RELATED EFFECT, ONE FOR METHOD OF COMPARISON, UP TO 4 DIFFERENT RELATIONSHIPS [TOTAL 8]

PART (D) ONE MARK (x2) FOR SUITABLE MANAGEMENT TECHNIQUE, ONE MARK (x2) FOR EXPLAINING WHY THIS WOULD MINIMISE EFFECTS [TOTAL 4]

VARIABLE NAMES, IF POORLY CHOSEN, CAN MAKE IT HARD FOR ANYONE OTHER THAN THE ORIGINAL DEVELOPER TO UNDERSTAND THE CODE. THIS CAN MAKE IT DIFFICULT TO MODIFY THE CODE IN RESPONSE TO CHANGING REQUIREMENTS. CODE OPTIMISATION MAY OR MAY NOT HAVE MUCH NOTICEABLE IMPACT ON THE USER, UNLESS SLOW CODE IN AN INNER LOOP MAKES THE SYSTEM SLOW TO RESPOND

(B) THE EFFECT OF CHANGING REQUIREMENTS CAN BE MEASURED BY LINKING A PROJECT PLAN INTO TASKS WITH TRACEABILITY FROM USER REQUESTS, AND MODIFICATION RECORDS WITHIN SOURCE FILES AND CHANGE CONTROL SYSTEMS. THE CONSEQUENCES OF POOR RESPONSE TIMES CAN BE MEASURED BY OBSERVING USERS, PERHAPS RUNNING EXPERIMENTS WITH A STOPWATCH.

(C) RESPONSE TIMES IN THE SYSTEM CAN BE COMPARED TO THE SPEED OF USER ACTIONS BY CARRYING OUT A KEYSTROKE-LEVEL MODEL ANALYSIS TO PREDICT OTHER CAUSES OF DELAY IN THE USER INTERFACE SUCH AS INEFFICIENT NAVIGATION.

OTHER PROBLEMS THAT CAN DISRUPT THE DEVELOPMENT PROCESS INCLUDE LACK OF CHANGE CONTROL, WHICH CAN PERMIT IN CHANGES BEING LOST, OR TOO CLOSE COUPLING BETWEEN MODULES, WHICH CAN MAKE CHANGES COSTLY. COMPARISONS COULD BE MADE ON THE BASIS OF CODE PRODUCTIVITY METRICS SUCH AS LINES OF CODE PER DAY

(D) IT IS BEST TO DEFER CODE OPTIMISATION UNTIL YOU ARE SURE THERE IS A PERFORMANCE PROBLEM. IN INTERACTIVE

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SYSTEMS, EVEN RELATIVELY SLOW SECTIONS OF CODE MAY STILL EXECUTE FASTER THAN USER RESPONSE TIMES. IF IT IS OBVIOUS THAT THE SYSTEM IS TOO SLOW, YOU COULD RUN A PROFILER TO FIND OUT WHICH PART OF THE CODE IS USING TOO MUCH TIME, THEN OPTIMISE THAT.

ONE WAY OF MINIMISING THE EFFECT OF REQUIREMENT CHANGES IS TO RUN A WATERFALL PROCESS, IN WHICH REQUIREMENTS MUST BE SIGNED OFF BEFORE CODING STARTS. AN ALTERNATIVE IS TO USE AN ITERATIVE DESIGN PROCESS, BUT ENSURE THAT CODING STANDARDS ARE APPLIED SUCH THAT CODE IS WELL-STRUCTURED, APPROPRIATELY DOCUMENTED, AND EASY TO CHANGE.

(ANSWER TIME : 16 MINUTES)