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|  | | Assignment # 01 | | | | |  | |
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|  | | | | 08 September 2022—Software Design and Analysis—Eng. Abdul Rahman |  | | | |
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**Question#01**

**SUMMARY**

In this study a system named “Automatic Higher Mathematic Examination System (AHMES)” was develop based on RUP. RUP (Rational Unified Process) explains how to design and deploy software systems using effective commercial and reliable methodologies. System was equipped with 11 questions generating engine and 108 mathematical models. Random question will be generated based on model. Collected the participants answers to check the difficulty level of model based rate of correctness. This system was generated to save a lot of time, energy, repetition factors and prevents cheating. Older system requires a lot of effort and has a risk of same repeated question in exam paper. Therefore, a new examination system that is different from the old one, a smarter, scientific, and controllable software system, needs to be developed. So for developing first there is need to collect requirements of system which is the most critical part because it forms the base of construction of software as the requirements will run in each phase of RUP so analysis of requirements is important. So department was concerned that proposed the requirements, the problem that need to be solved. So the requirements suggested the new mathematical models and system that should be flexible and scalable so RUP was selected as its as iterative used case driven that that can be adapted and extended to meet future demands. Python was selected because it is frequently used as scientific scripting language. For text formatting for initial phases export as word document was used and for future iteration export as pdf using latex me be used. Since RUP is template containing vast development guides so AHMES doesn’t required whole RUP model. After selection and configuration, the RUP includes these workflows: Business Modeling, Requirements, Analysis and Design, Implementation, Test, and Project Management. The one characteristics that made AHMES differs from old methods is the mathematical modeling that generated question based on mathematical models. As the difficulty level increases, the amount of calculation will increase. Referring to Qiong Chen’s difficulty setting method in his exam system, AHMES subdivided difficulty degree into 5 levels instead of 4 levels. Each mathematical model has an attribute of difficulty degree. AHMES is an automatic generating system of mathematics questions developed for university mathematics subjects. As of now, AHMES is the first software system to generate exam questions through mathematical models in linear algebra subjects.