NATIONAL INSTITUTE OF BUSINESS MANAGEMENT

DIPLOMA IN **SOFTWARE ENGINEERING 17.2F**

Software Engineering DSE-2-4-07

31th May 2018, 09.00 a.m. – 12.00 noon.

This paper contains 03 pages and **05** questions

Answer All questions.

Time: **THREE** hours.

Q1. Following questions are related to **Software Engineering** and **SDLC**.

i. Define the term "Software Engineering". (2 marks)

ii. Describe the stages of software development life cycle (SDLC) in detail. (6 marks)

iii. Who are the people involved in each stage of the SDLC ? (2 marks)

iv. What are the duties and responsibilities of a software engineer in developing a quality software product ? (2 marks)

v. What are the characteristics to be included in a **good** software product ? (2 marks)

vi. "Requirement Analysis" is a main task to be completed in the Analysis phase of SDLC. Describe 4 main requirement gathering techniques associated with the SDLC giving advantages and disadvantages of each method. (6 marks)

Q2. Below questions are on **Software Process Models**.

i. Describe why do we **need** a **Software Process Model** to develop a quality software system ? (2 marks)

ii. Compare and contrast "Waterfall Model" and "V Model" describing the kind of software systems they are well suited for and the major differences. (8 marks)

iii. "Spiral Model is suitable in developing large and complex software systems which take longer development times". Describe which features of the spiral model has supported to develop large and complex software systems ? (6 marks)

iv, What is a software prototype ? (2 marks)

iv. What is the most suitable software process model to develop a software system which has a good software requirement specification and which is small in size and require shorter development times ? (2 marks)

Q3. This question is based on **DFD**s and **UML** diagrams.

"IT Edu" is an institute providing IT education for the students who are willing to do certificate programs, diplomas and degree programs in IT. Presently they have a manual system and they are willing to replace it with an automated system. Draw a DFD for the following scenario to design an information system for them.

Students come to the front office and inquire about courses. The "front office executive" provides all the course information to the students. When the students get registered for a particular course, they should fill a registration form and should submit to the front office. Registration payments and first installment payments also will be collected at the time of registration. Front office executive will enter student information to the system and the system generated receipt and the registration card will be provided to the student.

When the adequate number of students are collected for a particular batch, a class and lecturers will be allocated for each batch and class schedule will be prepared and entered into the system. (These allocations will be done by the course coordinator and the information will be updated to the system by the front office executive). A system generated class schedule will be sent to the students each month. If there are any class cancellations, those will be informed to the students, a day before. Students will be informed about their next installment payments if they have not done the installment payments on time.

Management of the "IT Edu" has access to many of the above mentioned information and daily, weekly and monthly reports will be generated to the Management through the system.

i. Draw a context diagram and level 1 Data Flow Diagram for the above scenario. If you have any important information specify them at the bottom of the diagrams. Specify if you have made any assumptions.

(10 marks)

ii. Draw a class diagram for class scheduling process of the "IT Edu". (5 marks)

iii. Draw a sequence diagram for the student registration process of the "IT Edu".

(5 marks)

Q4. Following questions are based on **Agile software development** and **Software Testing**.

i. Why do most of the modern software organizations use Agile methodology for software development process ? (4 marks)

ii. What is a sprint in Scrum ? (2 marks)

iii. Who are the "Chickens" and "Pigs" in scrum? (4 marks)

iv. What is an "Error" in a program? (2 marks)

v. What is "White Box Testing"? (2 marks)

vi. What are the types of White Box Testing Methods used in Testing ? (6 marks)

Q5. Following questions will be based on **Software Architecture**, CASE tools, Software **Configuration Management** and **Software Maintenance**.

i. Explain why we need a software architecture for software we develop ? (4 marks)

ii. What is CASE ? What are the CASE tools we use to automate the software development process ? (4 marks)

iii. What are the software Configuration Management Activities ? (4 marks)

iv. What is "Reverse Engineering" ? (4 marks)

v. What are the types of software maintenance ? (4 marks)