*** Iqra National University, Peshawar***

**Department of Computer Science**

**Spring Semester 2020**

**Online Final – Term Examination**

**Course Code: 102002029/ 102002036**

**Course Title: Software Engineering**

**Instructor: Engr. Ghassan Husnain**

**Program: BS CS (Software Engineering) Total Marks: 50 Time Allowed: 6 Hours**

**Note: Attempt all Questions:**

**Question 1:** **Case Description**

INU Printing Press, a part of a University undertakes printing jobs from different departments of the University. The press can take printing related orders from other organizations or individuals also, but this is a rare practice*.* Orders once placed cannot be canceled. Any financial transactions of the various departments with the printing press are done through the University Office only. The University Office maintains the accounts of the press and the various departments of the University. The press acquires its inventory from outside suppliers. This is done by accepting the quotations from various suppliers and placing orders respectively. They maintain information of vendors / suppliers for the raw materials. A supplier can supply more than one item and an item can be supplied by more than one supplier. The supplier may supply the item in parts. Stock for a particular item can be acquired more than once in a year. The suppliers send two copies of invoice to the printing press, of which one is forwarded to the University Office. The press makes payment to the suppliers after obtaining approval from the University Office. The department places printing related order with the press and depending on the inventory, the press is entitled to give a response specifying whether the order will be fulfilled immediately or in the near future. Each department is assigned a budget at the beginning of the year, which becomes an important factor while getting any concession or discount from the press. Once the order is accepted, it has to go through various printing processes for its completion. However, these processes or the sequencing are not mandatory as a job or task may need different processing or handling. The various processes are:

 Composing

 Pasting

 Plate making

 Printing

 Binding

At the completion of the first copy, it is sent to the department for approval, which when received initiates the completion of the order. For the completion of the order, the press maintains a document known as costing sheet which specifies what all processes were applied and the inventory used for the completion of a particular order. This document is important in generating the bill.

3 delivery chalans are sent along with the items; one being kept in the press, second being given to the department and the third being sent to the University Office by the press. The invoice is not sent with the items, but it is sent at a later date due to complexity involved in preparing it. Two invoices are sent to the department; of which one is forwarded to the University Office by the department.

Summary of transactions as well as reports related to the printing press, are sent to the University Office on a regular basis. These reports or summary is useful to the management for analyzing their current budget and planning accordingly for future budget.

**Q.1.1:** Draw a Context diagram for INU Printing Press? ***6 marks***

**Q.1.2:** Draw a Level 1 Data Flow Diagram (DFD) for the above case study? ***8 marks***

**Q.1.3:** Draw a Level 2 DFD for the Order Registration Process, Press Production Process, Inventory Process, and Billing Process? ***12 marks***

**Question 2:**

**Q.2.1:** Explain why testing can only detect the presence of errors, not their absence? ***4 marks***

**Q.2.2:** Define the following terms: ***8 marks***

1. Unit Testing
2. System Testing
3. Black Box Testing
4. White Box Testing

**Question 3:**

**Q.3.1:** Briefly describe the three main types of software maintenance. Why is it sometimes difficult to distinguish between them? ***6 marks***

**Q.3.2:** What are the principal factors that affect the costs of system reengineering? Also briefly explain the reengineering process with the help of diagram: ***6 marks***

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