

- N. B.: (1) **All** questions are **compulsory**.
 (2) Makes **suitable assumptions** wherever necessary and **state the assumptions** made.
 (3) Answers to the **same question** must be **written together**.
 (4) Numbers to the **right** indicate **marks**.
 (5) Draw **neat labeled diagrams** wherever **necessary**.
 (6) Use of **Non-programmable** calculators is **allowed**.

1. **Attempt any three of the following:** 15
 - a. Explain Software Development Life Cycle (SDLC) with the help of diagram.
 - b. What is software? Explain the characteristics of software.
 - c. Define software engineering and its layer with the help of diagram.
 - d. Write a short note on spiral model.
 - e. What are functional and non-functional requirements of software?
 - f. Explain the principles of agile methods and discuss the problems with agile methods.

2. **Attempt any three of the following:** 15
 - a. Describe the different stages of system engineering process.
 - b. Explain the essential characteristics of socio technical system.
 - c. Define and explain the two types of emergent properties.
 - d. Explain the process or the steps of requirement engineering briefly.
 - e. Explain context diagram and its components of data flow diagram (DFD) with the help of example.
 - f. Explain legacy system categories and its assessment with the help of example.

3. **Attempt any three of the following:** 15
 - a. Define architectural design and explain the functions of architectural design.
 - b. Explain user interface design process (UID).
 - c. Explain software project management briefly.
 - d. Briefly explain the various stages performed in the process of risk management.
 - e. Explain the functions of quality assurance and its standards.
 - f. Describe why it is important to measure the software metrics.

4. **Attempt any three of the following:** 15
 - a. Explain the two phases of system testing: integration and release testing.
 - b. Explain briefly verification and validation (V & V) process.
 - c. List and describe the static analysis check points involved in automated static analysis.
 - d. Write a short note on size oriented metrics of software measurement.
 - e. Explain type of metrics function points and object point to estimate the software productivity
 - f. Describe three different models of Constructive Cost Models (COCOMO).

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5. Attempt any three of the following:

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- a. Explain various stages of process improvement with the help of diagram.
- b. Explain the different levels of **CMMI** (Capability Maturity Model introduced) Framework.
- c. Briefly describe the concept of **SOA** (Service Oriented Architecture) and the benefits of SOA.
- d. What are the benefit and problem of reusing software?
- e. Define distributed software engineering and explain the issues of distributed system.
- f. Write a short note on SaaS (Software as a Service).
