Fifth Semester B.E. Degree Examination, January 2025
BCS501 Software Engineering and Project Management

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

ANSWER SCHEME

Module 1

1.

a. Explain software process and software engineering practices.   **(10 Marks)**

Software Definition · Software is a set of items or objects that form a 'configuration' that includes programs, documents and data. —2M.

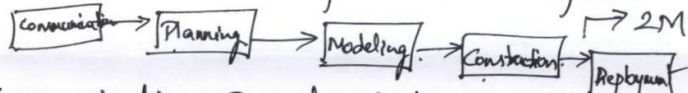Software Engineering Defn' —2M (May or may not be considered)

Software Process — 2M. +2M

Practices of software engineering. —4M +2M

*. Understand the problem.

*. Plan the solution.

* Carry out the plan.

*. Examine the result. for accuracy.

b. Explain the waterfall model and incremental model, with diagram.   **(10 Marks)**

Waterfall model — Explaination of 5 phases.

Communication → Planning → Modeling → Construction → Deployment →2M

Communication = Project initiation, requirements gathering

Planning — Estimating, scheduling, tracking.

Modeling — Analysis, design.

Construction — Code, Test.   →3M.

Deployment — Delivery, Support, feedback.

5M.

Incremental model:

Explaination — 3M. Diagram — 2M.

3+2 = 5M

OR

2.

   a. Explain Boehm Spiral process model with a neat diagram. Mention its advantages and disadvantages. **(10 Marks)**

Spiral process model :- Explaination of.

*Communication,   phases .

*Planning, *modeling .* Construction .

*deployment.   5M.

Advantages & disadvantages —3M .

Diagram —2M.   5+3+2=10M.

   b. Explain the five activities of a generic process framework for software engineering. **(10 Marks)**

Five activities of a generic Process framework.

Communication, Planning, modeling, Construction and deployment   5x2=10M

Explaination.

Module 2

3.

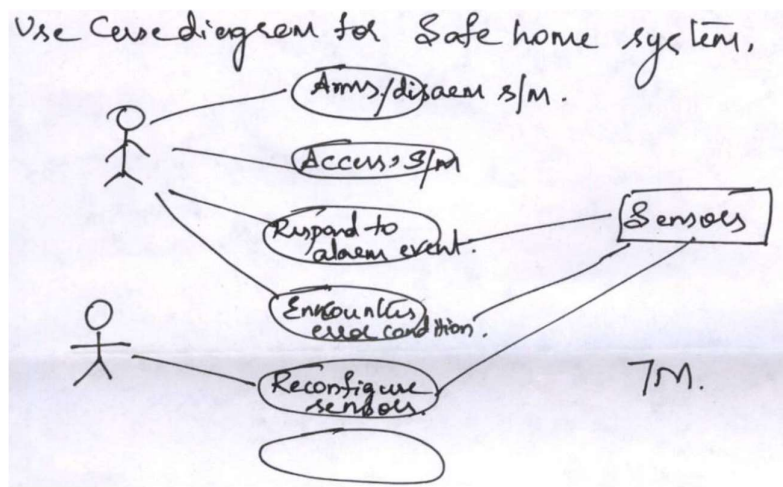   a. Explain the distinct tasks of requirements engineering. **(10 Marks)**

Requirement Engineering Explaination – 3M.

Distinct tasks of requirement engg are.

Inception, Elicitation, Elaboration, Negotiation, Specification, validation, Requirement management

             → 7x1=7.

   b. Illustrate the Use Case diagram for Safe Home System. **(10 Marks)**

Use. Case – A collection of user scenarios that describe the thread of usage of a system.

                3M

Use Case diagram for Safe home system.

Arms/disarm s/m.

Access s/m

Respond to alarm event.

Encounters error condition.

Reconfigure sensors.

Sensors

7M.

OR

4.

a. Explain Class-Responsibility-Collaborator modelling and Data modelling with an example.

(10 Marks)

Class-responsibility-collaborator (CRC) modeling provide a means for identifying and organizing the classes. that are relevant to system or product requirements. Explanation -3M.

Example -2M.

Data modeling - The relationships between the data objects, and other information that is pertinent to the relationships. exphn -3M.

example -2M.   5+5=10.

b. Explain the elements of analysis model in requirements modeling.   **(10 Marks)**

Elements of the Analysis model.

Scenario based models eg:- Use cases, User stories

Class models, eg: Class diagrams,

Behavioral models, eg:- State diagrams, Sequence diagrams

flow models. eg;- DFA's, data models.

4x2,5 = 10M

Module 3

5.

a. Explain principles of agile process development. **(10 Marks)**

Agility Definition. — Response to change, communication, customer to the team, flexible, lean, incremental delivery, of s/w, — 2M

Agile process development principles. 8M
* Satisfy customer.
* Welcome Changing.
* Deliver working s/w frequently.
* Motivated individuals.
* Daily work together
* face-to-face conversation.
* Working s/w.
* Constant pace.
* Technical excellence
* Simplicity
* Self-organizing.
* Tunes & adjusts.

b. Explain the following: **(10 Marks)**
   i. Adaptive Software Development
   ii. SCRUM

i> Adaptive Software Development phases.
1. Speculation 2, Collaboration 3, Learning.
Explaination — 3M   Diagram — 2M.
       3+2 = 5M

ii> Scrum - Explaination with distinguishing features like packets, Testing, documentation, Sprints, backlogs, demos — 5M.

OR

6.

a. Explain the concept of extreme programming in detail. **(10 Marks)**

Extreme Programming (XP) - Planning.
XP design, XP Coding, XP Testing,
XP debate   explaination — 8M.
    diagram - 2M.   8 + 2 = 10M

b. Explain design modelling framework that guide the respective framework activity. **(10 Marks)**

Design modeling Principles. are traceable, Architecture of the s/m, Design of data, User interface design, component-level design, Components loosely coupled, design representations, Iteration. explanation -10M

Module 4

7.

a. Illustrate the project management lifecycle with a neat diagram. **(10 Marks)**

Projects are not always successful. due to shortcoming in managing projects. - 2M (NA)
Project Management Life cycle. explanation -5M.
Project initiation; Project execution, Project closing,
diagram - 3M. + 2M   5+3+2=10M

b. Explain: (i) Different ways of categorizing software projects. **(10 Marks)**
   (ii) Smart objectives.

(ii)S -Specific, M-Measureable, A -Achievable, R-Relevant, T- Time Constrained —.
SMART Objectives .explanation — 5M.
(i)Different ways of categorizing projects.
 * Compulsory vs. voluntary users
 * Information s/ws vs Embedded s/ws.
 * Objectives vs, Products :___   5M.

OR

8.

a. Explain the differences between traditional versus modern management practices along with the role of management. **(10 Marks)**

Role of Management in S/w Project Management are Planning, Organizing, Staffing, Directing →5M Monitoring, Controlling, Innovating, Representing.

Traditional Vs modern Project management practices.
1. Planning incremental. delivery. →5M.
2. Quality management.   4. Requirements management
3. Change management.   5. Release management.

b. Explain software development lifecycle (ISO 12207) with a neat diagram. **(10 Marks)**

A Project is a temporary endeavor undertaken to create a unique product, service or result.
↳2M.
Software Development Life cycle (ISO 12207).

* Requirements analysis   * Qualification testing
* Architecture design.   * Installation.
* Code and test.   * Acceptance Support.
* Integration.
                            Explaination - 6M.

        Diagram - 2M.

Module 5

9.

a. Explain Quality Management System with principles of BS EN ISO-9001-2000. **(10 Marks)**

ISO. 9001. describes how a Quality Management. System can be applied to the creation of products. and the provision of services. → 2M .

Principles → 8×1 = 8M

* Understanding requirements * focus on systems
* Leadership . * Continuous improvement
* Involvement of staff . * Decision making .
* focus on individual processes . * Building relationships.

b. Explain the following: **(10 Marks)**
   (i) Mc Call's Quality Model   (ii) Garvin's Quality Dimensions.

Mc Call model.

McCall proposed a useful of factors that affect software quality, which focus on three important aspects of software product → 1M.

* Product Revision; Maintainability, flexibity, Testability.

Product Transition ; Portability, Reusability, Interoperability.

Product Operation; Correctness, Reliability, Durability, Integrity, Efficiency.

Explanation — 3M.

Diagram — 1M.

1+3+1 = 5M .

Garvin's Quality Dimension.

Eight dimensions are Performance quality, Feature quality, reliability, Conformance, Durability, Serviceability, Aesthetics, Perception.

→ 5M .

10.

a. Discuss six generic functions allowed in automated estimation techniques of software projects.

(10 Marks)

Software Project Estimation Defn — 3M
Six generic functions followed in automated estimation techniques are .
1. Sizing of Project deliverables. → 7M.
2. Selecting project activities .
3. Predicting staffing levels .
4. Predicting s/w eeffoct .
5. Predicting s/w cost.
6. Predicting software schedules .

b. Explain COCOMO II model. **(10 Marks)**

CO COMO II model consists of.
* Application composition model.
* Early design stage model.
* Post architecture-stage model.   Expln — 7M.
                                    10M

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