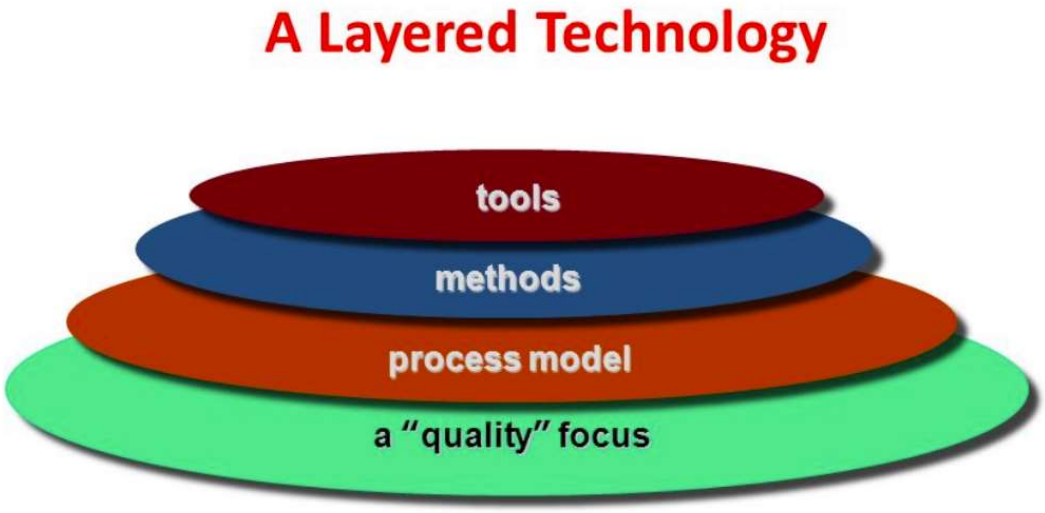
SASTRA ENGINEERING · MANAGEMENT · LAW · SCIENCES · HUMANITIES · EDUCATION DEEMED TO BE UNIVERSITY (U/S 3 of the UGC Act, 1956) THINK MERIT | THINK TRANSPARENCY | THINK SASTRA	**School of Computing** **First CIA Examination – Feb '24** Course Code: CSE215 Course Name: Software Engineering Duration: 90 minutes Max Marks: 50

PART A

Answer all the questions **5 x 2 marks = 10 marks**

1. Build the layered technology components of software.



2. Derive any four umbrella activities of software engineering.

EXPLANATION OF UMBRELLA ACTIVITIES

3. Enlist all prescriptive process models, specialized process models.

Prescriptive Process Models

1. Linear Water fall model
2. Parallel V-Model
3. Iterative Incremental Model
4. Evolutionary : Prototyping,
   concurrent Model,
   Spiral Model – win-win

Specialized process models

-Component-Based Development

-The Formal Methods Model

-Aspect-Oriented Software Development

- Team based Process Model

- Personal based Process Model

4. How does the Capability Maturity Model Integration level(CMMI) determines the company reputation?

- CMMI level 0: ***Incomplete*** - the process area (ex. requirements mgt) is either not performed or does not achieve all goals and objectives defined by CMM level1
- CMMI level 1: ***Performed*** - all of the specific goals of the process area have been satisfied
- CMMI level 2: ***Managed*** - all CMMI level1 satisfied, in addition org. policy handled, WP are monitored, controlled and reviewed, evaluated infront of stakeholders.
- CMMI level 3: ***Defined*** - above level must been achieved, in addition the process is tailored from the org. standard, guidelineslled and improved using measurement and qualitative assessment.
- CMMI level 4: ***Quantitatively managed*** : above level must been achieved, in addition the process area is controlled and improved using measurement and qualitative assessment.
- CMMI level 5: ***Optimized*** -In addition process area is adapted and optimized using quantitative (statistical) means to meet customer needs.

5. Developer A wants to develop similar existing Online shopping app as flipkart,
Developers B Team wants to develop a new satellite to Jupiter.
Justify your answer for the given software system with suitable decomposition strategies, process models.
Developer A – Top down decomposition strategy – Personalized software process model
Developers B Team – Bottom up approach – Team based process model

PART B

Answer to all Questions **3 x 10 marks = 30 marks**

6. Identify the process flow, process model, life cycles steps, effort nature of given software.(5 marks)
Draw its process model with its advantages and disadvantages.(5 marks)

Software Name	Process flow Name	Process model Name	Life cycle phases	Organic/ Semi attached/ embedded
Jinux OS	Linear	Waterfall	CPMCD	Organic
National Rose	Incremental	RUP	IECT	Semi attached
Smart watch ver3.0	Evolutionary	spiral	Review, risk mgt, construction on review, maintenance	Embedded
Open OfficeXP Package	Parallel	Agile – XP programming	Fast comm., quick modeling, rapid prototype, pair program	Semi attached CBSE

Diagrams, advantages, disadvantages = + 5 marks

7. Calculate FP count, **V**alue **A**djustment **F**actor and **Total FP count** of given ABC company's MIS
using Cost constructive model- COCOMO.

Marketing MIS:

Function	Raw FP
Monthly sales	4 reports
Sales summary1	5 documents
Sales summary2	5 documents
Sales summary3	5 documents
Sales summary4	5 documents
Sales summary5	5 documents
Sales Enquiry	4
Sales files	10
Product files	7
Location file	7

General Specification Characteristics are: (GSC)
Performance = 3 , reusability = 4,
Online updates =3, Installation easiness = 4
Online data entry = 3, Operational easiness = 4
End-user efficiency = 4, change facilitation = 5

8. Find Software size of given CAD software: A range of LOC estimates is developed for each function. For example, the range of LOC estimate for the 3D geometric analysis function is optimistic, 4600 LOC; most likely, 6900 LOC and pessimistic, 8600 LOC, And calculate Effort of the same using
   $E= 3.2 * (KLOC)^{1.05}$ Boehm simple KLOC method.
   Solution:
   Software Sizing formula: S= S opt+4 S m+ S pess/6
   Total software size in LOC = 4600+(4*6900)+8600/6= 40800/6 = 6800
   $E = 3.2 *(6.8)^{1.05}$
   E=3.2*7.48 = 23.94

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