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SECTION - A

① COCOMO - I

Case Study - 1.

Library Automation System (organic Mode).

A college Library automation system is expected to require 12 kLOC of code. using COCOMO - I organic mode, estimate :

1. Total Efforts (PM)
2. Development Time (Months).
3. Average staffing required (persons).

Sol :

organic mode constraints:

$$Effort = 2.4 \times (kLOC)^{1.05}$$

$$Time = 2.5 \times (Effort)^{0.38}.$$

Step 1 : Effort.

$$Effort = 2.4 \times (12)^{1.05}$$

$$= 2.4 \times (12)^{1.05} = 12.8$$

$$= 2.4 \times 13.8 = 33.12 \ PM$$

Step 2 : Development Time.

$$Time = 2.5 \times (33.12)^{0.38}$$

$$= (33.12)^{0.38} = 3.3.$$

$$= 2.5 \times 3.3 = 8.25 \ months$$

Step 3 : Staff.

$$Staff = Effort / Time$$

$$= 83.12/8.25$$
$$= 4 \text{ people } //$$

Ans //

1. Effort : 83.12 PM.
2. Time : 8.25 Months.
3. Staff : 4 people.

Section - B.

② COCOMO - II.

Case Study - I - online shopping portal.
An online shopping portal is estimated to be 20 kLOC. the Sum of Scale factors (SF) is 18 and EAF (Effort Adjustment Factor) from cost. devivers. = 1.15

Using COCOMO II post. Architecture model estimate :

1. Effort (PM)
2. Development Time (Schedule).

Sol:

COCOMO II formula :
$$\text{Effort} = 2.94 \times (\text{kSLOC}^E) \times \text{EAF}.$$
$$E = 0.91 + 0.01 \times \Sigma SF.$$

Given value :
kSLOC = 20.
SF = 18.
EAF = 1.15

Step 1 : Exponent
$$E = 0.91 + 0.01 \times 18$$
$$= 1.09 //$$

Step 2 : Effort.

Effort = $2.94 \times (20^{1.09}) \times 1.15$

$= 20^{1.09} = 25.1$

$= 2.94 \times 25.1 \times 1.15 = 84.9$ PM //

Step 3 : Time.

Total Development Time = $3.67 \times (Effort)^{0.28}$

$= 3.67 \times (84.9)^{0.28}$

$= (84.9)^{0.28} = 3.0$

$= 3.67 \times 3.0 = 11$ Months //

Answer :

1. Effort : 84.9 PM.

2. Development Time : 11 Months.

Function pointer Analysis (FPA) case Studies.

③ case study - I - Student Registration & result system.

The Student Registration & Result system. has the following.

1. External input (EI) : 5 (average).
2. External output (EO) : 4 (high).
3. External Enquiries (EQ) : 3 (Low).
4. Internal Logical Files (ILF) : 3 (average).
5. External Interface file (EIF) : 2 (low)
6. Given Rating sum GSC ($\Sigma (GSC)$) : 22.

Calculate :

1. UFP.

2. TCF

3. Final Function points (FP).

Solution:

Weight Table:

Component	Low	Avg	High
EI	3	4	6
EO	4	5	7
EQ	3	4	6
ILF	7	10	15
EIF	5	7	10

Given Value:

$EI = 5 (avg)$

$EO = 4 (high)$

$EQ = 3 (low)$

$ILF = 3 (Avg)$

$EIF = 2 (low)$

$\Sigma(GSC) = 22$

Step 1 : UFP.

$EI = 5 \times 4 = 20$

$EO = 4 \times 7 = 28$

$EQ = 3 \times 3 = 9$

$ILF = 3 \times 10 = 30$

$EIF = 2 \times 5 = 10$

$UFP = 20 + 28 + 9 + 30 + 10$

$\qquad = 97 //$

Step 2 : TCF.

$TCF = 0.65 + 0.01 * \Sigma(GSC)$

$\qquad = 0.65 + 0.01 \times 22$

$\qquad = 0.87 //$

Answer.	
1. UFP : 97	
2. TCF : 0.87	
3. FP : 84	

Step 3 : FP.

$FP = UFP \times TCF$

$\qquad = 97 \times 0.87$

$\qquad = 84 FP //$