Assign - 4 :-

	Req	Analysis	Design	Code	U.T	I.T	Syst.T	field	Total
Req.	49								49
Analysis	34	61							95
Design	67	34	123						224
code	13	23	77	241					354
Unit T	39	21	67	78	13				218
Integrat T	23	4	3	98	-	9			137
System T	14	8	5	29	-	-	7		63
Field	7	5	4	6	-	-	-	8	30
Total	246	156	279	452	13	9	7	8	1170

Defect removal rate for every phase.

Total SLOC = 120

∴ 1. Requirement = 49/120 = 0.408

2. Analysis = 95/120 = 0.791

3. Design = 224/120 = 1.86

4. Coding = 354/120 = 2.95

5. unit testing = 218/120 = 1.81

6. Integration testing = 137/120 = 1.14

7. System testing = 63/120 = 0.525

8. field = 30/120 = ~~0.0861~~ 0.25

2. Defect injection rate for every phase.

1. Requirement = 246/120 = 2.05 / KLOC
2. analysis = 156/120 = 1.30 / KLOC
3. Design = 279/120 = 2.32 / KLOC
4. Coding = 452/120 = 3.76 / KLOC
5. Unit Testing = 13/120 = 0.108 / KLOC
6. Integration Testing = 9/120 = 0.075 / KLOC
7. System Testing = 7/120 = 0.058 / KLOC
8. field. = 8/120 = 0.066 / KLOC

3. Defect Escape rate for every phase.

	Defects injected	Defects removed	Defect escaped	Escape rate
1. Requirement	246	49	197	1.64
2. Analysis	156	95	246+156-49-95 = 258	2.15
3. Design	279	224		
	279+156+246-224-95-49 =		313	2.6
4. Coding	452	354		
	452+279+156+246-49-95-224-354 =		411	3.42
5. Unit testing	13	218		
	13+452+279+156+246-49-95-224-354-218 =		206	1.71
6. Integration test	9	137		
	9+13+452+279+156+246-49-95-224-354-218-137 =		78	0.65

7. System testing	7	63 ~~30~~	22 ~~0~~	0.18 ~~0.06~~
8. field.	8	30 ~~28~~	0	0

Therefore:

Defect Escape rate for every phase.

1. Requirement	1.64 / KLOC
2. Analysis	2.15 / KLOC
3. Design	2.60 / KLOC
4. Coding	3.42 / KLOC
5. Unit testing	1.71 / KLOC
6. Integration testi	0.65 / KLOC
7. System	0.18 / KLOC
8. field	0 / KLOC.

4. Overall defect removal effectiveness.

Overall DRE of the project = [1 − (defects removed in field / total number of defects) * 100 %.]

$$= 1 - \frac{30}{1170} * 100\ \%.$$

$$= \frac{1170 - 30}{1170} = \frac{1140}{1170} * 100 = 97.4\ \%.$$

5. which phase is the most effective ?

Defect removal effectiveness : Defects removed / defects Existing defect injected *100

1. Requirement phase :

Defects removed in current phase : 49

defect in step Entry = 0

defect injected in curr t phas = 246

$$= \frac{49}{246} * 100 = 19.9\%$$

2. Analysis phase

$$= \frac{95}{246-49+156} * 100 = \text{~~23.6 \%~~}. = 26.9\%.$$

3. design phase

$$= \frac{224}{258+279} * 100 = 41.7\%.$$

4. coding phase

$$= \frac{354}{313+452} = 46.2\%.$$

5. testing phases.

(i) unit testing $= \frac{218}{218+137+63+30} = 48\%.$

for testing phase

$$\frac{\text{Defects removed at current phase}}{\text{Defect removed at Current phase + Subsequent phase}} * 100\%.$$

(ii) Integration Testing

$$= \frac{137}{137+63+30} = 59.5\%.$$

(iii) System Testing

$$= \frac{63}{63+30} = 67.7\%.$$

(iv) field

$$= \frac{30}{30} = 100\%.$$

∴ Defect removal effectiveness.

Requirement	19.9 %.
Analysis	26.9 %.
Design	41.7 %.
coding	46.2 %.
unit testing	48.5 %.
Integration	59.5 %.
System testing	67.7 %.

∴ System testing phase is the most effective in removing defects.

6. Do you think reviews and inspections are effective? Explain.

The phases Requirement to coding comes under reviews and inspection.

∴ The total number of defects in project = 1170

number of defect from requirement to coding phase got found

$= 49 + 95 + 224 + 354$

$= 722$

$\therefore \frac{722}{1170} = 0.617 = 61.7\%$.

∴ The 61.7% of the defects are found through the reviews and inspection

Therefore YES ! The inspections and reviews are found to be effective.

7. defects originated in design phase increase by 10% and defect detected in design phase by 10%. Then the impact of DRE in coding phase.

defect originated increase by 10%.

$$\therefore \frac{10}{100} * 246 \simeq 24.6 \simeq 25$$

~~defect found in re~~

$$\therefore \frac{10}{100} * 279 \simeq 28$$

defect found at design review increase by 10%.

$$\frac{10}{100} * 224 \simeq 22.$$

$\therefore$ New defects injected = 279 + 28 = 307

New defect found = 224 + 22 = 246.

The defect removal Effectiveness in coding phase

$$= \frac{354}{246+156+307-49-95-246+452} * 100 = 0.459$$

$$= 45.9\%.$$

Previous DRE for coding phase = 46.2%.

Current DRE for coding phase = 45.9%.

$\therefore$ The increase of 10% in defects origen and defect found has a NEGATIVE EFFECT on the defect removal Effectiveness of coding phase.