

**Q4)** The earliest finish date for the project if 100% of the resources are utilized when project is scheduled to start on 1/29/24 is **8/5/24**.

**Q5)** If you are not allowed to use more than 20% of the resources available at any point of time for this project, what is the earliest finish date for this project if it is scheduled to start on 1/29/24

Answer: **9/4/26**

### Calculations:

### Formula:

**We know that:** Effort = Amount of work/Productivity rate

Duration = Effort/ No. of Resources

Let's take Given Amount of Work as "W", Productivity rate as "P"

### Project plan: 9 days

- 1. Write Plan:** Given W= 51 pages, P= 2pages/Hour  
Effort =  $51/2 = \text{Roundoff}(25.5) = 26\text{hrs} = 4\text{dys}/1\text{HCT}$   
Duration=  $4/1 = 4$  days.
- 2. Review Plan:**
  - a. Preparation for review:** Given W= 51 pages, P= 4pages/Hour  
Effort =  $51/4 = \text{Roundoff}(12.75) = 13\text{hrs} = 2\text{dys}/1\text{HCT}$   
Duration=  $(2\text{days}/1\text{HCT}) * 5 = 2$  days.
  - b. Review Meeting:** Given W= 51 pages, P= 5 pages/Hour  
Effort =  $51/5 = \text{Roundoff}(10.2) = 11\text{hrs} = 2\text{dys}/1\text{HCT}$   
Duration=  $(2\text{days}/1\text{HCT}) * 6 = 2$  days.
- 3. Rework:** Given W= 32 defects, P= 5 defects/Hour  
Effort =  $32/5 = \text{Roundoff}(6.4) = 7\text{hrs} = 1\text{dys}/1\text{HCT}$   
Duration=  $1/1 = 1$  day.

**Risk Mitigation and Contingency Plan: 7 days**

1. **Write Plan:** Given  $W = 65$  pages,  $P = 5$  pages/Hour  
Effort =  $65/5 = 13\text{hrs} = 2\text{dys}/1\text{HCT}$   
Duration =  $2/1 = 2$  days.
2. **Review Plan:**
  - a. **Preparation for review:** Given  $W = 65$  pages,  $P = 5$  pages/Hour  
Effort =  $65/5 = 13\text{hrs} = 2\text{dys}/1\text{HCT}$   
Duration =  $(2\text{dys}/1\text{HCT}) * 5 = 2\text{dys}$ .
  - b. **Review Meeting:** Given  $W = 65$  pages,  $P = 10$  pages/Hour  
Effort =  $65/10 = \text{Roundoff}(6.5) = 7\text{hrs} = 1\text{day}/1\text{HCT}$   
Duration =  $(1\text{days}/1\text{HCT}) * 6\text{HCT} = 1\text{day}$ .
3. **Rework:** Given  $W = 61$  defects,  $P = 4$  defects/Hour  
Effort =  $61/4 = \text{Roundoff}(15.25) = 16\text{hrs} = 2\text{dys}/1\text{HCT}$   
Duration =  $2/1 = 2$  days.

**Requirement: 13 days**

1. **Write requirements:** Given  $W = 167$  Req,  $P = 5$  Req/Hour  
Effort =  $167/5 = \text{Roundoff}(33.4) = 34\text{hrs} = 5\text{dys}/1\text{HCT}$   
Duration =  $5/3 = 2$  days.
2. **Write Use Case Model:** Given  $W = 78$  Use cases,  $P = 3$  use cases/2 Hours  
Effort =  $(78/(3/2)) = 52\text{hrs} = \text{roundoff}(6.5) = 7\text{dys}/1\text{HCT}$   
Duration =  $7/4 = 2$  days.
3. **Review Requirements/ Use case model:**
  - a. **Preparation for review:** Given  $W = 167$  Req, 78 use cases,  $P = 18$  Req/Hour, 4 use cases/Hour  
Effort =  $(167/18 + 78/4) = (9.2 + 19.5) = \text{roundoff}(28.7) = 29\text{hrs} = 4\text{dys}/1\text{HCT}$   
Duration =  $(4\text{dys}/1\text{HCT}) * 4 = 4$  days.
  - b. **Review Meeting:** Given  $W = 167$  Req, 78 use cases,  $P = 28$  Req/Hour, 6 use cases/Hour  
Effort =  $(167/28 + 78/6) = (5.9 + 13) = \text{roundoff}(18.9) = 19\text{hrs} = 3\text{dys}/1\text{HCT}$   
Duration =  $(3\text{dys}/1\text{HCT}) * 5 = 3$  days.
4. **Rework:** Given  $W = 189$  defects,  $P = 10$  defects/Hour  
Effort =  $189/10 = \text{Roundoff}(18.9) = 19\text{hrs} = 3\text{dys}/1\text{HCT}$   
Duration =  $3/2 = 2$  days.

**Analysis: 9 days**

1. **Write Analysis Document:** Given  $W = 89$  pages,  $P = 3$  pages/Hour  
Effort =  $89/3 = 30\text{hrs} = 4\text{dys}/1\text{HCT}$   
Duration =  $4/3 = 2$  days.
2. **Review Analysis Document:**
  - a. **Preparation for Analysis Document:** Given  $W = 89$  pages,  $P = 4$  pages/Hour.  
Effort =  $89/4 = \text{roundoff}(22.25) = 23\text{hrs} = 3\text{dys}/1\text{HCT}$   
Duration =  $(3\text{dys}/1\text{HCT}) * 4 = 3$  days/4HCT.
  - b. **Review Meeting:** Given  $W = 89$  pages,  $P = 9$  pages/Hour.  
Effort =  $89/9 = \text{roundoff}(9.8) = 10\text{hrs} = 2\text{dys}/1\text{HCT}$   
Duration =  $(2\text{dys}/1\text{HCT}) * 5 = 2$  days/5HCT.
3. **Rework:** Given  $W = 123$  defects,  $P = 5$  defects/Hour  
Effort =  $123/5 = \text{Roundoff}(24.6) = 25\text{hrs} = 4\text{dys}/1\text{HCT}$   
Duration =  $4/2 = 2$  days.

**Design: 23 days**

1. **Write DD:** Given  $W = 184$  pages,  $P = 5$  pages/Hour  
Effort =  $184/5 = \text{roundoff}(36.8) = 37\text{hrs} = 5\text{dys}/1\text{HCT}$   
Duration =  $5/3 = 2$  days.
2. **Review DD:**
  - a. **Preparation for DD:** Given  $W = 184$  pages,  $P = 4$  pages/Hour  
Effort =  $184/4 = 46\text{hrs} = 6\text{dys}/1\text{HCT}$   
Duration =  $(6\text{dys}/1\text{HCT}) * 4 = 6$  days/4HCT.
  - b. **Review Meeting:** Given  $W = 184$  pages,  $P = 8$  pages/Hour  
Effort =  $184/8 = 23\text{hrs} = 3\text{dys}/1\text{HCT}$   
Duration =  $(3\text{dys}/1\text{HCT}) * 5 = 3$  days/5HCT.
3. **Rework:** Given  $W = 231$  defects,  $P = 4$  defects/Hour  
Effort =  $231/4 = \text{Roundoff}(57.7) = 58\text{hrs} = 8\text{dys}/1\text{HCT}$   
Duration =  $8/3 = 3$  days.
4. **Write Data Model(DM):** Given  $W = 34$  pages,  $P = 1$  pages/4Hours  
Effort =  $(34/(1/4)) = 136\text{hrs} = 17\text{dys}/1\text{HCT}$

Duration=  $17/4 = 5$  days.

**5. Review DM:**

**a. Preparation for DM:** Given  $W = 34$  pages,  $P = 3$  pages/Hour  
Effort =  $34/3 = \text{roundoff}(11.3) = 12\text{hrs} = 2\text{dys}/1\text{HCT}$   
Duration=  $(2\text{dys}/1\text{HCT}) * 4 = 2$  days/4HCT.

**b. Review Meeting:** Given  $W = 34$  pages,  $P = 5$  pages/Hour  
Effort =  $34/5 = \text{roundoff}(6.8) = 7\text{hrs} = 1\text{dys}/1\text{HCT}$   
Duration=  $(1\text{day}/1\text{HCT}) * 5 = 1$  day/5HCT.

**6. Rework:** Given  $W = 92$  defects,  $P = 5$  defects/Hour  
Effort =  $92/5 = \text{Roundoff}(18.4) = 19\text{hrs} = 3\text{dys}/1\text{HCT}$   
Duration=  $3/3 = 1$  day.

**Coding and unit test: 63days**

**1. Write Code:** Given  $W = 5123$  SLOC,  $P = 5$  SLOC/Hour  
Effort =  $5123/5 = \text{roundoff}(1024.6) = 1025\text{hrs} = 129\text{dys}/1\text{HCT}$   
Duration=  $129/5 = 26$  days.

**2. Unit testing:**

**a. Prepare/Execute Test cases:** Given  $W = 317$  test cases,  $P = 10$  testcases/Day.  
Effort =  $(317/(10/8)) = 254\text{hrs} = 32\text{dys}/1\text{HCT}$   
Duration=  $32/4 = 8$  days.

**b. Fix Found Defects:** Given  $W = 271$  defects,  $P = 8$  defects/Day.  
Effort =  $(271/(8/8)) = 271\text{hrs} = 34\text{dys}/1\text{HCT}$   
Duration=  $34/4 = 9$  days.

**c. Test fixed defects:** Given  $W = 271$  defects,  $P = 12$  defects/Day.  
Effort =  $(271/(12/8)) = 181\text{hrs} = 23\text{dys}/1\text{HCT}$   
Duration=  $23/4 = 6$  day.

**3. Code Inspection:**

**a. Preparation for code inspection:** Given  $W = 5123$  SLOC,  
 $P = 100$  SLOC/Hour  
Effort =  $5123/100 = \text{roundoff}(51.23) = 52\text{hrs} = 7\text{dys}/1\text{HCT}$   
Duration=  $(7\text{dys}/1\text{HCT}) * 4 = 7$  days/4HCT.

**b. Code Inspection Meeting:** Given  $W = 5123$  SLOC,  
 $P = 210$  SLOC/Hour

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Effort =  $5123/210 = 25\text{hrs} = 4\text{dys}/1\text{HCT}$   
Duration =  $(4\text{dys}/1\text{HCT}) * 5 = 4 \text{ days}/5\text{HCT}$ .

- c. **Rework:** Given  $W = 195$  defects,  $P = 5$  defects/Hour  
Effort =  $195/5 = 39\text{hrs} = 5\text{dys}/1\text{HCT}$   
Duration =  $5/2 = 3 \text{ days}$ .

**Testing: 123 days**

1. **Write Test Plan(TP):** Given  $W = 231$  pages,  $P = 5$  pages/Day  
Effort =  $(184/(5/8)) = 369\text{hrs} = 47\text{dys}/1\text{HCT}$   
Duration =  $47/4 = 12 \text{ days}$ .
2. **Review TP:**
  - a. **Preparation for TP:** Given  $W = 231$  pages,  $P = 4$  pages/Hours  
Effort =  $(184/4) = 58\text{hrs} = 8\text{dys}/1\text{HCT}$   
Duration =  $(8\text{dys}/1\text{HCT}) * 4 = 8 \text{ days}/4\text{HCT}$ .
  - b. **Review TP Meeting:** Given  $W = 231$  pages,  $P = 8$  pages/Hour  
Effort =  $231/8 = 29\text{hrs} = 4\text{dys}/1\text{HCT}$   
Duration =  $(4\text{dys}/1\text{HCT}) * 5 = 4\text{days}/5\text{HCT}$ .
  - c. **Rework:** Given  $W = 310$  defects,  $P = 7$  defects/Hour  
Effort =  $310/7 = 45\text{hrs} = 6\text{dys}/1\text{HCT}$   
Duration =  $6/2 = 3 \text{ days}$ .
3. **Execute TP(test cases):** Given  $W = 345$  testcases,  $P = 14$  test cases/Day  
Effort =  $(345/(14/8)) = 198\text{hrs} = 25\text{dys}/1\text{HCT}$   
Duration =  $25/3 = 9 \text{ days}$ .
4. **Fix Found Defects:** Given  $W = 248$  defects,  $P = 5$  defects/Day  
Effort =  $(248/(5/8)) = 397\text{hrs} = 50\text{dys}/1\text{HCT}$   
Duration =  $50/5 = 10 \text{ days}$ .
5. **Test Fixed defects:** Given  $W = 248$  defects,  $P = 10$  defects/day  
Effort =  $(248/(10/8)) = 199\text{hrs} = 25\text{dys}/1\text{HCT}$   
Duration =  $25/3 = 9 \text{ days}$ .

**Documentation: 13 days**

1. **User Documentation:** Given  $W = 146$  pages,  $P = 4$  pages/Hour  
Effort =  $146/4 = 37\text{hrs} = 5\text{dys}/1\text{HCT}$   
Duration =  $5/2 = 3 \text{ days}$ .

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2. **Review UD:**

- a. **Preparation for UD review:** Given  $W = 146$  pages,  $P = 4$  pages/Hour

Effort =  $146/4 = 37\text{hrs} = 5\text{dys}/1\text{HCT}$

Duration =  $(5\text{dys}/1\text{HCT}) * 4 = 5\text{days}/4\text{HCT}$ .

- b. **Review UD Meeting:** Given  $W = 146$  pages,  $P = 10$  pages/Hour

Effort =  $146/10 = \text{round off}(14.6) = 15\text{hrs} = 2\text{dys}/1\text{HCT}$

Duration =  $(2\text{dys}/1\text{HCT}) * 5 = 2\text{ days}/5\text{HCT}$ .

- c. **Rework:** Given  $W = 283$  defects,  $P = 6$  defects/Hour

Effort =  $283/6 = 48\text{hrs} = 6\text{dys}/1\text{HCT}$

Duration =  $6/2 = 3\text{ days}$ .