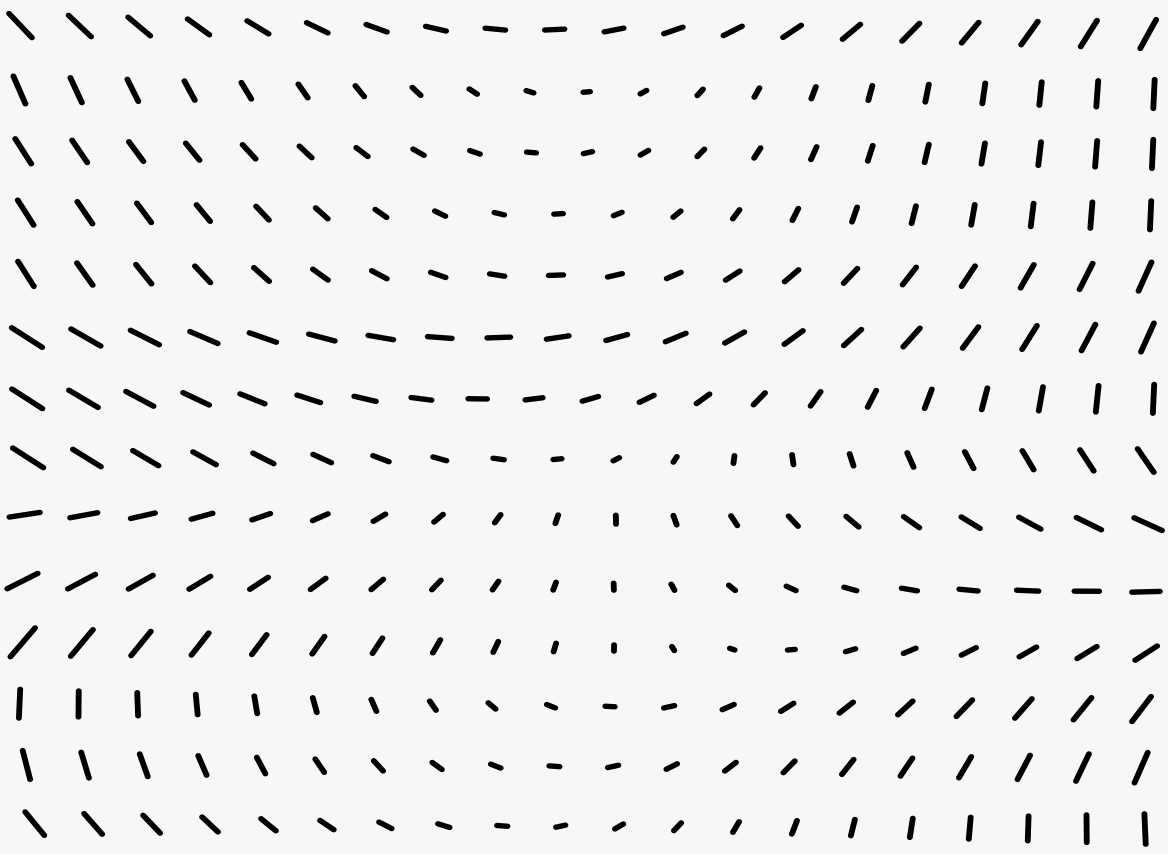
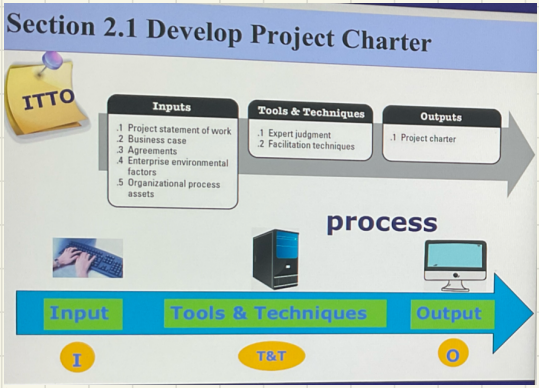


ITTO

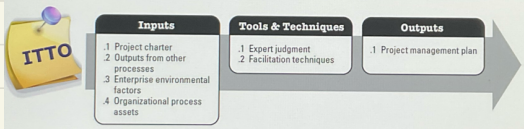
Section 2.1 Develop Project Charter



Section 2.2 Develop Project Management Plan

Develop Project Management Plan

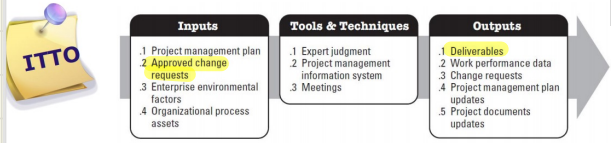
Develop Project Management Plan is the process of defining, preparing, and coordinating all subsidiary plans and integrating them into a comprehensive project management plan.
The key benefit of this process is a central document that defines the basis of all project work.



Section 2.3 Direct and Manage Project Work

Direct and Manage Project Work

- Direct and Manage Project Work is the process of leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objectives.
- The key benefit of this process is that it provides overall management of the project work.



ection 2.3 Direct and Manage Project Work

Input

1. **Project Management Plan**
   - Output of the process of "develop project managemen plan"
2. **Approved Change Requests**
3. **Enterprise Environmental Factors**
4. **Organizational Process Assets**

区别

Section 2.3 Direct and Manage Project Work

Section 2.3 Direct and Manage Project Work

Output

- **Deliverables**
  - any unique and verifiable product, result or capability to perform a service that is required to be produced to complete a process, phase, or project.
- **Work Performance Data**
  - work completed
  - key performance indicators
  - technical performance measures
  - start and finish dates of schedule activities
  - number of change requests, number of defects
  - …
- **Change Requests**
- **Project Management Plan Updates**
- **Project Documents Updates**

ection 4.5 Develop Schedule

53

ITTO

Inputs	Tools & Techniques	Outputs
.1 Schedule management plan .2 Activity list .3 Activity attributes .4 Project schedule network diagrams .5 Activity resource requirements .6 Resource calendars .7 Activity duration estimates .8 Project scope statement .9 Risk register .10 Project staff assignments .11 Resource breakdown structure .12 Enterprise environmental factors .13 Organizational process assets	.1 Schedule network analysis .2 Critical path method .3 Critical chain method .4 Resource optimization techniques .5 Modeling techniques .6 Leads and lags .7 Schedule compression .8 Scheduling tool	.1 Schedule baseline .2 Project schedule .3 Schedule data .4 Project calendars .5 Project management plan updates .6 Project documents updates

Developing an acceptable project schedule is often an iterative process.

The schedule model is used to determine the planned start and finish dates for project activities and milestones based on the best available information.

ection 4.5 Develop Schedule

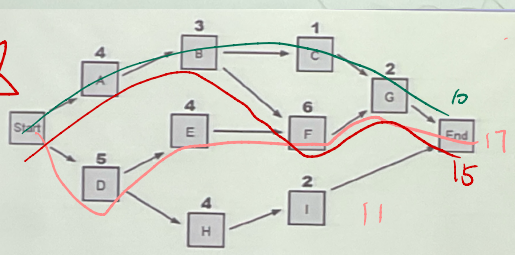
58

Critical path method

A method used to estimate the minimum project duration and determine the amount of scheduling flexibility on the logical network paths within the schedule model.

This schedule network analysis technique calculates the early start, early finish, late start, and late finish dates for all activities without regard any resource limitations by performing a forward and backward pass analysis through the schedule network.

大题不考资源限制



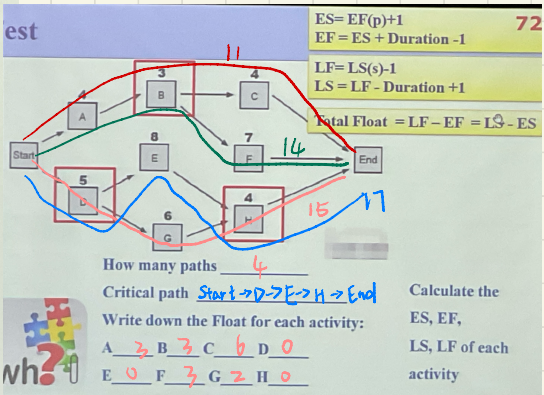
How many paths 4

Critical path Start → D → E → F → G → End

Write down the Float for each activity:

A 2 B 2 C 7 D 0 E 0

F 0 G 0 H 6 I 6



How many paths 4

Critical path Start → D → E → H → End

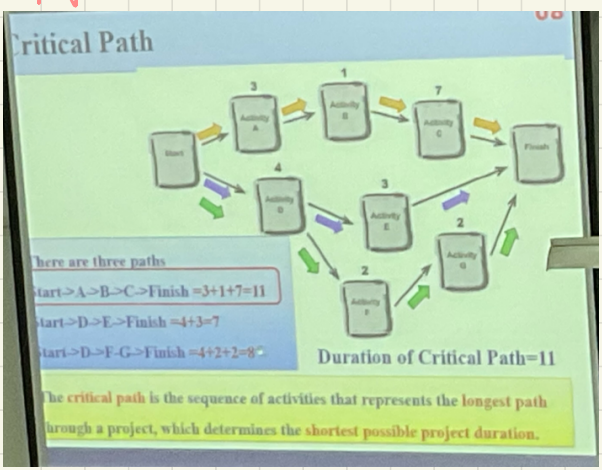
Write down the Float for each activity:

A 3 B 3 C 6 D 0

E 0 F 3 G 2 H 0

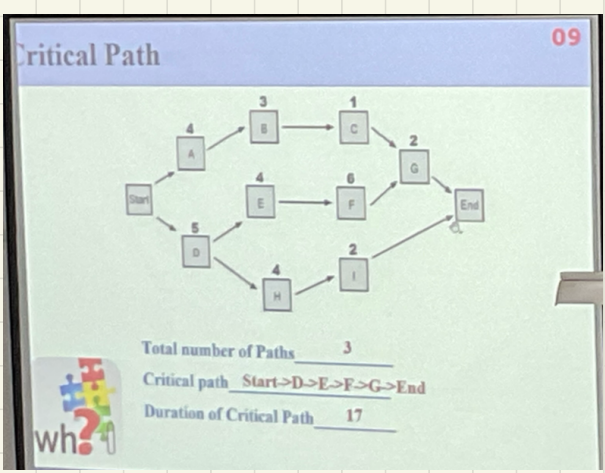
Calculate the ES, EF, LS, LF of each activity

问答题



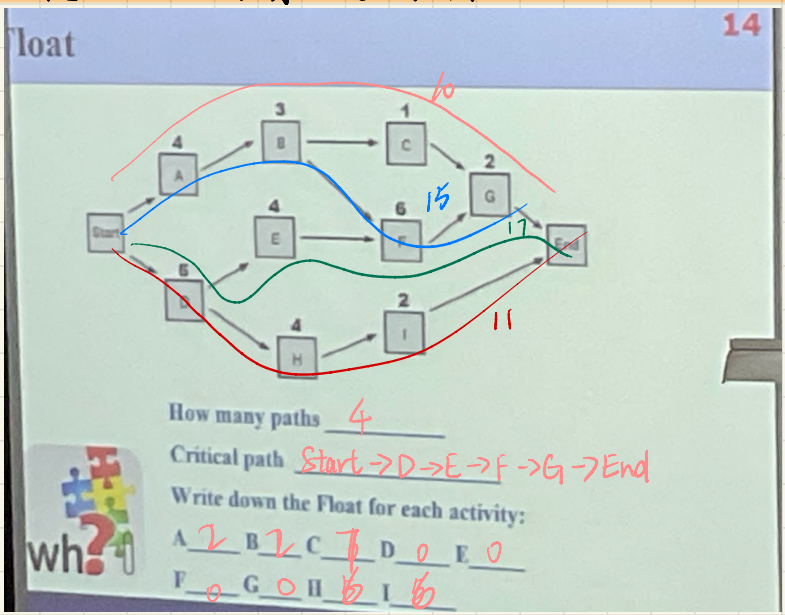
1-2分

从 Start 开始　　End 结束

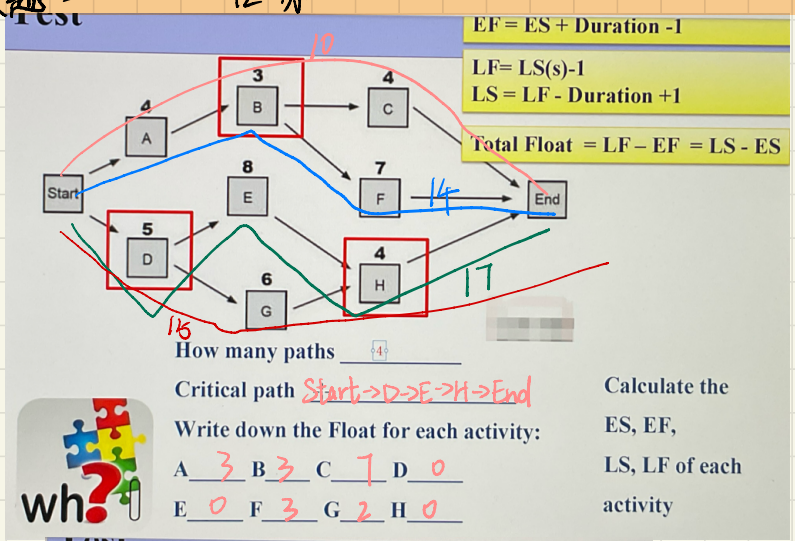


先选关键路径 (Float = 0)
再选次长的
如果一个活动同时在2条路径，取 Float 小的

简答题一　9分　3小问



大题一　12分



考试考到G

ES EF LS LF

A

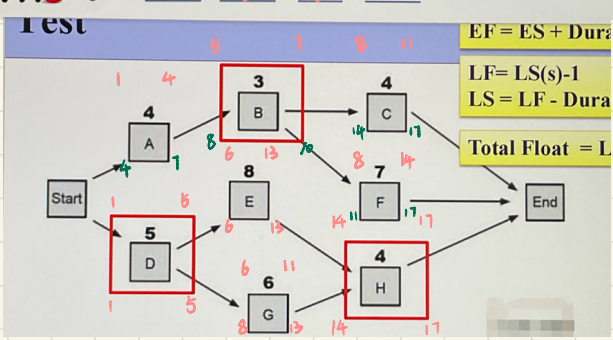
B

C

D

小题意：

无J，LF取最小(早)的



Test 大题二 8分

- 3. Calculations
  (1)According to the tables below, please calculate the UFC, TCF and FP for this software project.
- (2) If the productivity of this project is 15 hours/FP, then please calculate the workload of this project.
- (3) If the cost for each labor hour is ¥100/hour, what is the total cost of this project.

Test

Feature Count items	counts
External input	1 medium
External Output	1 complex
External inquiry	1 simple
External interface file	1 simple, 2 medium
Internal documents	2 simple

Feature Count items	Complexity Weight		
	simple	medium	complex
External input	3	4	6
External Output	4	5	7
External inquiry	3	4	6
External interface file	5	7	10
Internal documents	7	10	15

Technical complexity factors					
F1	Reliable backup and recovery	1	F2	data communication	3
F3	Distributed function	2	F4	performance	2
F5	Large use of configuration	1	F6	On-line data entry	4
F7	Simplicity of operation	1	F8	On-line upgrade	2
F9	Complex interface	1	F10	Complex data processing	3
F11	Reusability	4	F12	Installation simplicity	2
F13	Multiple Sites	2	F14	Easy to modify	3

(1) UFC = 1×4 + 1×7 + 1×3 + 1×5 + 2×7 + 2×7 = 47

sum(Fi) = 31

TCF = 0.65 + 0.01 (sum(Fi)) = 0.65 + 0.31 = 0.96

FP = UFC × TCF = 45.12

(2) Workload = 15 × FP = 676.8 hours

(3) Total cost = 676.8 × 100 = 67680 ¥

大题三 13分

Your project has a total budget of $300,000. You check your records and find that you've spent $175,000 so far. The team has completed 40% of the project work, but when you check the schedule it says that they should have completed 50% of the work. Calculating the following:

BAC = $300,000

PV = $300,000 × 50% = $150,000

AC = $175,000

EV = $300,000 × 40% = $120,000

EV - PV

SV = $120,000 − $150,000 = $ -30,000

EV - AC

CV = $120,000 − $175,000 = $ -55,000

SPI = $EV / $PV = 150000/150000 = 4/5 = 0.8

CPI = $EV / $AC = 24/35 = 120/175

35

Cost overrun and schedule over budget

答案是 0.68

It's nine months into your project. The total budget for your project is $4,200,000. You've spent $1,650,000 so far, and you've got a CPI of 0.875. Use the Earned Value Technique formulas from forecasting to figure out where things stand.

BAC = 4200,000

AC = 1650,000

CPI = 0.875

EAC = BAC / CPI = $BAC / $CPI = 4800,000

EAC = BAC/CPI - AC

EV

EAC/AC = BAC/EV

ETC = $4800,000 - $1650,000 = $3150,000

VAC = $4200,000 - $4800,000 = $ -600,000

ETC = EAC - AC

VAC = BAC - EAC

Will the project be over or under budget when it's complete?

-600000 over budget

Test

Which of the following activities are not projects, why?

1. Explore Mars for signs of life ✓
2. Report to department manager for monthly work ✗
3. The development of new versions of the operating system ✓
4. Updating the website 12306.cn ✓
5. Daily cleaning is a project ✗

There is a haze boundary between the non-routing project and the routing job.

The first time you do a routine task it will be like a project

Test

1. **A portfolio is a set of related projects that together deliver a specific business objective.**
2. **A project could be part of a program, or exist individually.** ✓
3. **A program consists of all the projects being undertaken by an organization.**

内容	正确性	原因解析
tfolio is a set of **related projects** that her deliver a specific business tive. 组合是一组**相关的项目**，共同实现特定业示。）	No ✗	**错误**： - 项目组合（Portfolio）包含的是**不一定相关**的项目、项目集和其他工作（如运营活动），它们按战略优先级组合，目标是实现组织整体战略目标。 - 描述中"related projects"属于项目集（Program）的特征，而非项目组合。
ject could be part of a program, or individually. 项目可以属于项目集，也可以独立存	Yes ✓	**正确**： - 项目（Project）具有灵活性： ✓ 可独立运作（如开发一个独立软件）； ✓ 可归属于项目集（Program）（如"智能家居生态系统开发"项目集中的硬件研发子项目）。
gram consists of **all the projects** being rtaken by an organization. 集包含组织正在进行的**所有项目**。）	No ✗	**错误**： - 项目集（Program）仅包含**相互关联且需协调管理**的项目（如"新冠疫苗研发"项目集包含临床试验、生产设施建设等关联项目）。 - 组织**所有项目**的集合属于项目组合（Portfolio），而非单个项目集。

Test　　Ture or false?　　15

- **In the functional organizational structure, the project manager manages the project budget.** ✗
- **In the projectized organizational structure, the project manager has high authority.** ✓

Tests-week 2: true or false

1. Software project management is important for improving professional qualities. ✓
2. A software project is always visible. ✗
3. In the functional organizational structure, the project manager manages the project budget. ✗
4. In the projectized organizational structure, the project manager has high authority. ✓
5. Agile model provides an opportunity for quick and frequent feedback to keep the project on the right track. ✓
6. Waterfall model belongs to the Adaptive Life Cycle. ✗
7. Process is able to transform the structured management to unstructured management. ✗

Tests-Week 2

- 8. What are Five Process Groups?
  - Initiating, planning, executing, monitoring & controlling, closing
- 9. What is Software Project Management?
  - Software Project Management is a system management method based on software project, which uses the relevant knowledge, techniques and tools for planning, organizing, advising and controlling each stage of software project cycle to achieve the project objectives.
- 10. Please list the 8 activities of Software Development Life Cycle?
  - Requirements Analysis, Architecture Design, Detailed Design, Code and Test, Integration, Qualification Testing, Installation, Acceptance Support

Section 2.2 Develop Project Management Plan

Input

Enterprise Environmental Factors	V.S.	Organizational Process Assets
• Affect the project • Can not be affected • Systems		• plans, processes, policies, procedures, and knowledge bases

Test: Ture or false?

1. Enterprise Environmental Factors are under the control of the project team. X
2. Project management plan is a kind of Organizational Process Assets. X

Test- true or false?

1. The project charter is produced during the ~~planning~~ Initiating stage of the project. X
2. The Project Management Plan is approved by the sponsor. √

Test- true or false?

1. In the process of Perform Integrated Change Control, Changes can only be requested by project manager. X any stakeholder
2. In the process of Perform Integrated Change Control, Change Requests should be recorded in written form. √
3. The Approved Change Requests will be taken as an ~~output~~ input of Perform Integrated Change Control process. X

input of Direct and Manage Project Work

Test- true or false?

1. The release of organization resources is needed in the Close Project process. √
2. Work Performance Reports are produced based on Work Performance Information. √

Test

The product scope is measured against the ()

A. Measure of success
B. Requirement
C. Scope baseline
D. Contract

Completion of the project scope is measured against ()

A. Requirement
B. Scope baseline
C. Project management plan
D. The sponsor

Section 3.2 Collect Requirements

44

1. You have a geographically dispersed team, from whom you would like to get expert opinion about your project. Which information gathering technique should you use:

地理分散

A. Brainstorming
B. Affinity Diagram
C. Delphi Technique ✓
D. Focus group ✗

2. As a project manager, you are organizing a brainstorming meeting to collect requirements. You can interrupt someone if you think they are wrong. (true or false) ✗

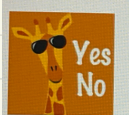
题目： 您有一个地理分散的团队，希望从中获取关于项目的专家意见。应使用以下哪种信息收集技术？
选项：
A. 头脑风暴 (Brainstorming)
B. 亲和图 (Affinity Diagram)
C. 德尔菲技术 (Delphi Technique)
D. 焦点小组 (Focus Group)

正确答案：C. 德尔菲技术 (Delphi Technique)
解析：

- **德尔菲技术** 专为**地理分散的专家**设计，通过**匿名、多轮问卷**收集意见，最终达成共识。
  - ☑ **匿名性**：避免权威人物主导讨论。
  - ☑ **迭代反馈**：汇总意见后多轮修正，提升结论准确性。
  - ☑ **无地域限制**：依赖书面沟通，适合分散团队。
- **其他选项排除**：
  - **A. 头脑风暴**：需实时互动，地理分散团队难以高效协作。
  - **B. 亲和图**：用于**归类**头脑风暴的产出，非独立收集技术。
  - **D. 焦点小组**：需集中于系人现场讨论，不适合分散团队。

Test

Which is the purpose of WBS?



A. To show which work elements have been assigned to organizational units

B. To show the organizational structure of a program

C. To ensure that all work within a project is identified and defined within a common framework ✓

D. All of the above

正确答案：C
解析：

1. **选项A（错误）**：
   - 描述的是 **组织分解结构（OBS, Organizational Breakdown Structure）** 的作用，而非WBS。
   - OBS 将工作包（Work Packages）映射到部门/团队，用于明确责任分工。
2. **选项B（错误）**：
   - 描述的是 **组织架构图（Organizational Chart）** 的作用，用于显示汇报关系和团队层级。
   - WBS 聚焦于 **工作成果（Deliverables）**，而非人员结构。
3. **选项C（正确）**：
   - ☑ **WBS 的根本目的**是：
     - 将项目范围**逐层分解**为可管理的组成部分（可交付成果→控制账户→工作包）。
     - 遵循 **100%规则**：包含项目全部工作，无遗漏或重叠。
     - 建立**统一框架**，为进度、成本、资源规划提供基础。
4. **选项D（错误）**：
   - A、B 选项与WBS无关，因此不可能是"全部"。

Test

71

Which of the following is TRUE about a work breakdown structure?

- A、It contains work packages that are described in a linear, unstructured list. ✗
- B、Each item in the WBS represents a feature in the product scope, ✗
- C、The WBS represents all of the work that must be done on the project. ✓
- D、The WBS is created by the product sponsor and stakeholders. ✗

project team

The WBS is a hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.

Test

Using the WBS shown below (right) , a typical work package would be ?

A. Software development

B. Systems design

C. Flowcharting ✓

D. Coding

1.	S/W development
1.1	Systems design
1.1.1	H/W requirement
1.1.2	Flowcharting
1.2	Coding
1.2.1	Language selection

Test

A work package is a ?

A. Required level of reporting

B. Task with a unique identifier

C. Task that can be assigned to more than one organizational unit

D. Deliverable at the lowest level of the WBS ✓

Test

Which is NOT included in a scope baseline?

- A、Project scope statement
- B、WBS
- C、WBS Dictionary
- D、Requirements document

Test

86

In a software project, a programmer thinks of a way to make a feature better and just implements it, without talking it over with anybody. This situation belongs to:

- A、Scope creep
- B、Gold plating

Test: true or false?

15

1. Final output of Define Activities is described as ~~work packages~~ activities. X
2. The Create WBS process defines the final outputs as ~~activities~~ work packages. X
3. Milestones are similar to activities, but they have zero duration. √

Test

27

You are managing a software project. Your QA manager tells you that you need to plan to have her team start their test planning activity so that it finishes just before testing begins. What's the relationship between the test planning activity and the testing activity?

A. Start-to-start (SS)

B. Start-to-finish (SF)

C. Finish-to-finish (FF)

D. Finish-to-start (FS) √

Test

50

If the optimistic estimate is one, the pessimistic estimate is nine, and the most likely estimate is eight, what is the three point estimate?

A. 9

B. 7 √

C. 8

D. 3

$$\frac{tO + 4tM + tP}{6}$$

Test

Which of the following tools is used for adding buffers to a schedule?

A. Three-point estimates

B. Critical path analysis

C. Expert judgment

D. Critical chain method √

Test

46

- 1. Alice is a project manager. She estimates each activity and resource that the team is going to need. Then she adds up all the estimates into "rolled-up" categories. From there she adds up the categories into an overall budget number. Which tool is Alice using?
- A、Parametric Estimation
- B、Analogous Estimation
- C、Bottom-up estimating √
- D、Three-point Estimating

Test

47

2. Alice is estimating cost for a software project using the three point estimating method. If the optimistic estimate is 1,000 dollars, the pessimistic estimate is 9,000 dollars, and the most likely estimate is 2,000 dollars, what is the expected cost under the Beta Distribution?

- A、2,000 dollars
- B、3,000 dollars √
- C、4,000 dollars
- D、5,000 dollars

$\frac{1000 + 8000 + 9000}{6}$

Beta Distribution $cE=(cO+4cM+cP)/6$

Test

48

- 3. Calculations
  (1)According to the tables below, please calculate the UFC, TCF and FP for this software project.
- (2) If the productivity of this project is 15 hours/FP, then please calculate the workload of this project.
- (3) If the cost for each labor hour is ¥100/hour, what is the total cost of this project.

Test

49

Feature Count items	counts
External input	1 medium
External Output	1 complex
External inquiry	1 simple
External interface file	1 simple, 2 medium
Internal documents	2 simple

Feature Count items	Complexity Weight		
	simple	medium	complex
External input	3	4	6
External Output	4	5	7
External inquiry	3	4	6
External interface file	5	7	10
Internal documents	7	10	15

Technical complexity factors					
F1	Reliable backup and recovery	1	F2	data communication	3
F3	Distributed function	2	F4	performance	2
F5	Large use of configuration	1	F6	On-line data entry	4
F7	Simplicity of operation	1	F8	Online upgrade	2
F9	Complex interface	1	F10	Complex data processing	3
F11	Reusability	4	F12	Installation simplicity	2
F13	Multiple Sites	2	F14	Easy to modify	3

Software Project Cost Estimating

50

Feature Count items	counts	Complexity weight
External input	1 medium	4
External Output	1 complex	7
External inquiry	1 simple	3
External interface file	1 simple, 2 medium	5,7,7
Internal documents	2 simple	7,7

UFC=1*4+1*7+1*3+1*5+2*7+2*7=47

Software Project Cost Estimating

5

Technical complexity factors					
F1	Reliable backup and recovery	1	F2	data communication	3
F3	Distributed function	2	F4	performance	2
F5	Large use of configuration	1	F6	On-line data entry	4
F7	Simplicity of operation	1	F8	Online upgrade	2
F9	Complex interface	1	F10	Complex data processing	3
F11	Reusability	4	F12	Installation simplicity	2
F13	Multiple Sites	2	F14	Easy to modify	3

sum(Fi)=31

TCF=0.65+0.01(sum(Fi))=0.65+0.01*31=0.96

Test

52

- 3. Calculations
  (1)According to the tables below, please calculate the UFC, TCF and FP for this software project.
- (2) If the productivity of this project is 15 hours/FP, then please calculate the workload of this project.
- (3) If the cost for each labor hour is ¥100/hour, what is the total cost of this project.
  - UFC=1*4+1*7+1*3+1*5+2*7+2*7=47
  - sum(Fi)=31
  - TCF=0.65+0.01(sum(Fi))=0.65+0.01*31=0.96
  - FP =UFC*TCF=45.12
  - Workload=15*45.12=676.8 hours
  - Total cost=676.8*100=67680¥

Test

Your project has a total budget of $300,000. You check your records and find that you've spent $175,000 so far. The team has completed 40% of the project work, but when you check the schedule it says that they should have completed 50% of the work. Calculating the following:

BAC= $_____ PV = $_____ × ___ % = $_____

AC = $_____ EV = $_____ × ___ % = $_____

SV = $_____ − $_____ = $_____

CV = $_____ − $_____ = $_____

SPI = $ / $ = _____

CPI = $ / $ = _____

Test

Your project has a total budget of $300,000. You check your records and find that you've spent $175,000 so far. The team has completed 40% of the project work, but when you check the schedule it says that they should have completed 50% of the work. Calculating the following:

BAC= $ 300000 PV = $ BAC × 50 % = $ 150000

AC = $ 175000 EV = $ BAC × 40 % = $ 120000

SV = $ EV − $ PV = $ -30000

CV = $ EV − $ AC = $ -55000

SPI = $ EV / $ PV = 0.8

CPI = $ EV / $ AC = 0.68

Cost overrun and schedule over budget

Test

It's nine months into your project. The total budget for your project is $4,200,000. You've spent $1,650,000 so far, and you've got a CPI of 0.875. Use the Earned Value Technique formulas from forecasting to figure out where things stand.

EAC = $ 4200000 / $ 0.875 = 4800000 — **EAC = BAC/CPI**

ETC = $ 4800000 - $ 1650000 = $ 3150000 — **EAC = AC + ETC**

VAC = $ 4200000 - $ 4800000 = $ -600000 — **VAC = BAC – EAC**

Will the project be over or under budget when it's complete?

-600000 over budget

Test

The applications being built by your programming team have lots of bugs. So, you write up coding standards that will guide everyone in building the product with more attention to quality.

Prevention ✓ Inspection

You set up code reviews at important milestones in your project to catch defects as early as you can.

Prevention Inspection ✓

Test

Which of the following tools and techniques is used to show which categories of defects are most common?

A. Control charts
B. Pareto charts ✓ 80/20
C. Run charts
D. Flow charts

Which quality control tool is sued to analyze processes by visualizing them graphically?

A. Checklists
B. Histograms
C. Pareto charts
D. Flowcharts ✓

- 正确答案：B. Pareto charts
  - 原因：
    - **帕累托图（Pareto Chart）** 基于 **80/20 法则**（即 80% 的问题由 20% 的原因引起），通过降序条形图展示缺陷类别的频率分布，直观标识 **最常见缺陷类别**。
    - **其他选项**：
      - A. 控制图（Control Charts）：监控过程是否稳定，不分析缺陷类别分布。
      - C. 运行图（Run Charts）：跟踪数据随时间的变化趋势，不聚焦缺陷分类。
      - D. 流程图（Flow Charts）：描述流程步骤，不统计缺陷频率。

Test

47

1. You use a Pareto chart to figure out which root causes are responsible for the most defects in the current batch of products. It looks like most of them are coming from a Machine Calibration problem. So you run them back through the machine after re-calibrating it.

Perform Quality Control ✓ Perform Quality Assurance

2. You use a histogram to look at the root cause category for all defects that have been found over the past year. You find that Machine errors are habitually responsible for the largest number of errors across all batches of products. You schedule Machine calibration checks at the start of every shift to be sure that the machine is always set properly.

Perform Quality Control ✓ Perform Quality Assurance

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Test

4

Project manager has provided each kind of training for the team members. Team members begin to work together and adjust work habits that support the team. What stage is the project team at?

A. Forming

B. Storming

C. Norming ✓

D. Performing

Test

53

1) Look Sue, Joe's already filled me in on your issue. I've considered his position, and I've decided that he's right, so I don't need to hear any more about it

_____

A. Withdrawal

B. Smoothing

C. Compromise

D. Force ✓

E. Collaborate

Test

37

Take a look at this table of

Risk	Probability	Impact
Navigation equipment failure	15%	costs $300 due to getting lost
Unseasonably warm weather	8%	saves $500 in excavation costs
Wild animals eat rations	10%	costs $100 for replacement run

1. Calculate the EMV for each of these three risks

Navigation equipment failure: 15%×(-$300) = $-45.00
Unseasonably warm weather: 8% ×$500= $40.00
Wild animals eat rations: 10% ×(-$100) = $-10.00

2. If these are the only risks on the project, calculate the total EMV

Total EMV = -$45.00+$40.00+(-$10.00) = -$15.00

Test

50

Which risk response technique is being used in these situations?

1. If the weather's good, then there's a chance you could see a meteor shower. If the team gets a photo that wins the meteor photo contest, you can get extra funding. You have your team stay up all night with their telescopes and cameras ready.

Exploit

2. You hear that it's going to rain for the first three days of your trip, so you bring waterproof tents and indoor projects for the team to work on in the meantime.

Mitigate

Test

25

1. The buyer will pay for the cost of phone service, rent on the facilities, and employees, plus an additional $2500 per month

Cost Plus Fixed Fee (CPFF)

2. The buyer will pay the seller a total of $285,000 for 18 months of technical support services

Firm Fixed Price Contracts (FFP)

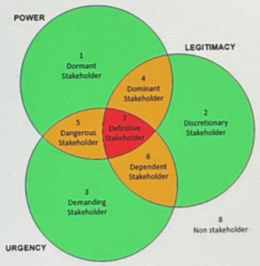
3. The buyer will pay for the cost of phone service and rent on the facilities, plus $4,500 per month for employees' time. Costs will not exceed $14,500 per month

Time and materials

Test

15

- Which kind of classification model is used to identify stakeholders based on their power, urgency and legitimacy?
  - A、Power/interest
  - B、Power/influence grid
  - C、Influence/impact grid
  - D、Salience model



Test

- You're managing a project with two client sponsors, and you have a 10-person team reporting to you. You've been given a budget increase, which allowed you to increase your team size by 30%. How many lines of communication were added?
  - A、66
  - B、78
  - C、120
  - D、42

You 1
Team 10
Sponsor 2
Total 13
Num of Lines=
13*12/2=78

You 1
Team 10+10*30%=13
Sponsor 2
Total 16
Num of Lines=
16*15/2=120