INF3708 - NOV 2015

QUESTION 1 [5]

Select the most appropriate answer: Write down only the appropriate letter representing your choice next to the corresponding question number in your answer book:

SOLUTION

1.1	A (p. 4)
1.2	A (p. 83)
1.3	B (p.111)
1.4	E (p. 172)
1.5	A (p. 230)

QUESTION 2 [15]

Earned value analysis has gained popularity as a technique for controlling project costs. Earned value analysis assigns a value to each task or work package (as identified in the WBS) based on the original expenditure forecasts.

Amanda's baseline budget shown in Table 1 is based on the schedule shown in Figure 1.

a. Draw a graph showing the earned value (BCWP) at week 12 and the Baseline budget (BCWS). **(5 marks)**
b. Draw a graph showing the earned value tracking chart. Your chart should also show these statistics: budget variance, schedule variance, and cost variance. **(10 marks)**

Table 1: Amanda's baseline budget calculation

Task	Budgeted workdays *r*	Scheduled completion	Cumulative workdays *w*	% cumulative earned value
Specify overall system	34	34	34	14.35
Specify module B	15	49 i	[64	27.00
Specify module D	15	49 '		
Specify module A	20	54	84	35.44
Check specifications	2	56	86	36.28
Design module D	4	60	90	37.97
Design module A	7	63	97	40.93
Design module B	6	66	103	43.46
Check module C spec	1	70	104	43.88
Specify module C	25	74	129	54.43
Design module C	4	79	133	56.12
Code & test module D	25	85	158	66.67
Code & test module A	30	93	188	79.32
Code & test	28	94 i	[231	97.47

module B				
Code & test module C	15	94 1		
System integration	6	100	237	100.00

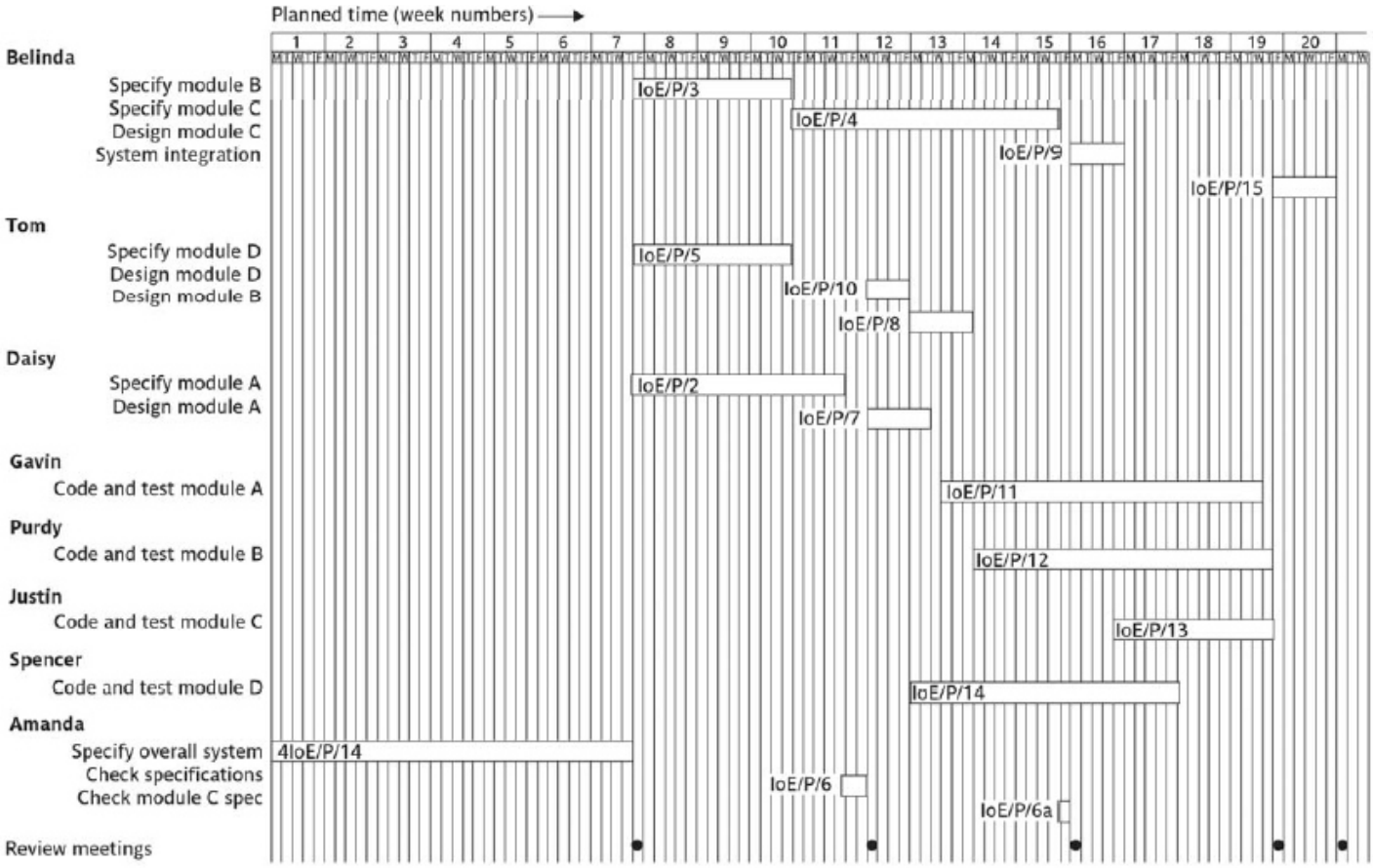


Figure 1: Amanda's work schedule (note that each week is made up of 5 days (M,T,W,T,F))

SOLUTION

a. p. 226-227

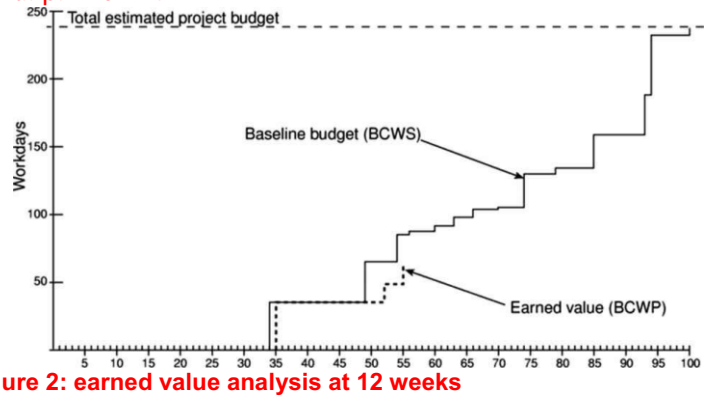


Figure 2: earned value analysis at 12 weeks

Figure 2 shows Amanda's earned value analysis at the start of week 12 of the project. The earned value (BCWP) is clearly lagging behind the baseline budget, indicating that the project is behind schedule.

b. As well as recording BCWP, the actual cost of each task can be collected as actual cost of work performed, ACWP. This is shown in Figure 3, which, in this case, records the values as percentages of the total budgeted cost.

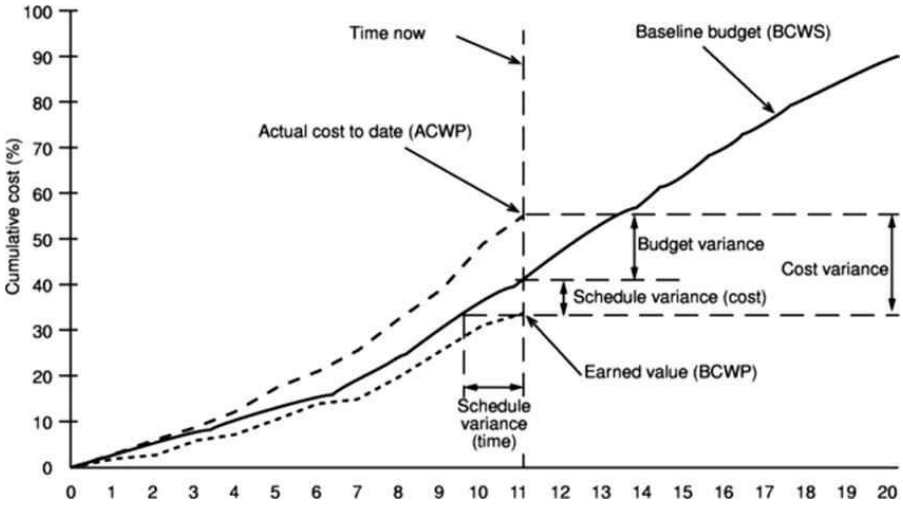


Figure 3: earned value tracking chart

Figure 3 also illustrates the following performance statistics, which can be shown directly or derived from the earned value chart.

Budget variance: This can be calculated as ACWP - BCWS and indicates the degree to which actual costs differ from those planned.

Schedule variance: The schedule variance is measured in cost terms as BCWP -BCWS and indicates the degree to which the value of completed work differs from that planned. Figure 3 also indicates the schedule variance in time, which indicates the degree to which the project is behind schedule.

Cost variance: This is calculated as BCWP - ACWP and indicates the difference between the budgeted cost and the actual cost of completed work. It is also an indicator of the accuracy of the original cost estimates.

QUESTION 3 [20]

A resource in a project is any item or person required for the execution of the project.

a. Describe any 5 of the 7 categories of resources in a project. **(3 marks each)**
b. Give a suitable example for each resource category described in (a). **(1 mark each)**

SOLUTION

Students can describe any of the following 7 categories of resources. (p.194)

In general, resources will fall into one of seven categories.

• **Labour**: The main items in this category will be members of the development project team such as the project manager, systems analysts and software developers. Equally important will be the quality assurance team and other support staff and any employees of the client organization who might be required to undertake or participate in specific activities.

• **Equipment**: Obvious items will include workstations and other computing and office equipment. We must not forget that staff also need basic equipment such as desks and chairs.

• **Materials**: Materials are items that are consumed, rather than equipment that is used. They are of little consequence in most software projects but can be important for some - software that is to be widely distributed might, for example, require supplies of floppy disks to be specially obtained.

• **Space**: For projects that are undertaken with existing staff, space is normally readily available. If any additional staff (recruited or contracted) should be needed then office space will need to be found.

• **Services**: Some projects will require procurement of specialist services -development of a wide area distributed system, for example, requires scheduling of telecommunications services.

• **Time**: Time is the resource that is being offset against the other primary resources - project time-scales can sometimes be reduced by increasing other resources and will almost certainly be extended if they are unexpectedly reduced.

• **Money**: Money is a secondary resource - it is used to buy other resources and will be consumed as other resources are used. It is similar to other resources in that it is available at a cost - in this case interest charges.

QUESTION 4 [20]

In the PERT network diagram illustrated in the figure 4 below, the targeted date for the completion of the project is nine (9) weeks.

a. Use table 2 below to calculate the expected (t_e) values and standard deviation (s) **(10 marks)**
b. Indicate the t_e and s values on Figure 4 below. **(10 marks)**

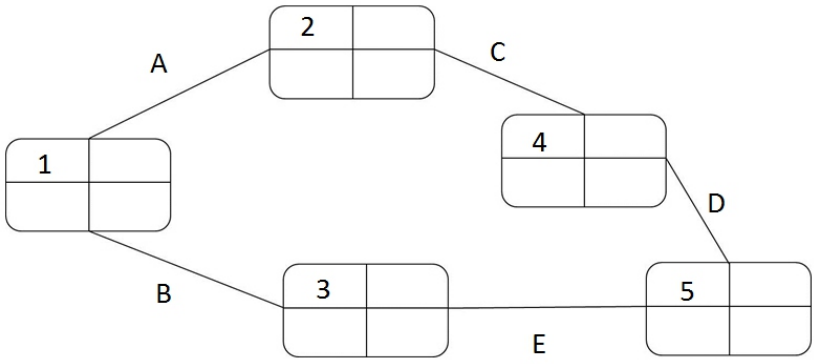


Figure 4: PERT Network

Table 2: Values for the PERT Network

	Optimistic (a)	Most likely (m)	Pessimistic (b)	Expected (t_e)	Standard deviation (s)
A	1	2	3		
B	3	4	5		
C	2	3	4		
D	1	2	3		
E	3	4	5		

SOLUTION

(p.177-179)

a. Use the formula below to calculate the t_e values of each activity:

$$= \frac{+4 \quad +}{6}$$

Calculating the t_e value of Activity A: $t_e = [1 + 4(2) + 3] / 6 = 12 / 6 = 2$
Calculating the t_e value of Activity B: $t_e = [3 + 4(4) + 5] / 6 = 24 / 6 = 4$
Calculating the t_e value of Activity C: $t_e = [2 + 4(3) + 4] / 6 = 18 / 6 = 3$
Calculating the t_e value of Activity D: $t_e = [1 + 4(2) + 3] / 6 = 12 / 6 = 2$
Calculating the t_e value of Activity E: $t_e = [3 + 4(4) + 5] / 6 = 24 / 6 = 4$

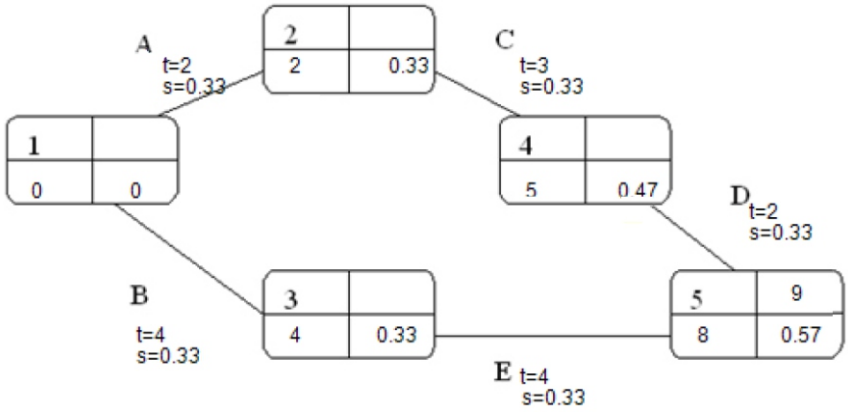
Use the formula below to calculate the s values of each activity:

$$\frac{+4 \quad +}{6}$$

S= b-a/6

Calculating the s value of Activity A: s = [3 - 1]/6 = 2 / 6 = 0.3
Calculating the s value of Activity B: s = [5 - 3] / 6 = 2 / 6 = 0.3
Calculating the s value of Activity C: s = [4 - 2] / 6 = 2 / 6 = 0.3
Calculating the s value of Activity D: s = [3 - 1] / 6 = 2 / 6 = 0.3
Calculating the s value of Activity E: s = [5 - 3] / 6 = 2 / 6 = 0.3

b.



QUESTION 5 [20]

As a project planner you have picked out and examined what appear to be the most threatening risks to the project. You now need to record your findings in a risk register. Draw the diagram of a typical risk register showing the usual contents of such a register.

SOLUTION

Based on Figure 7.5, p. 175 students can be awarded full marks for showing knowledge of the main concepts in a risk register.