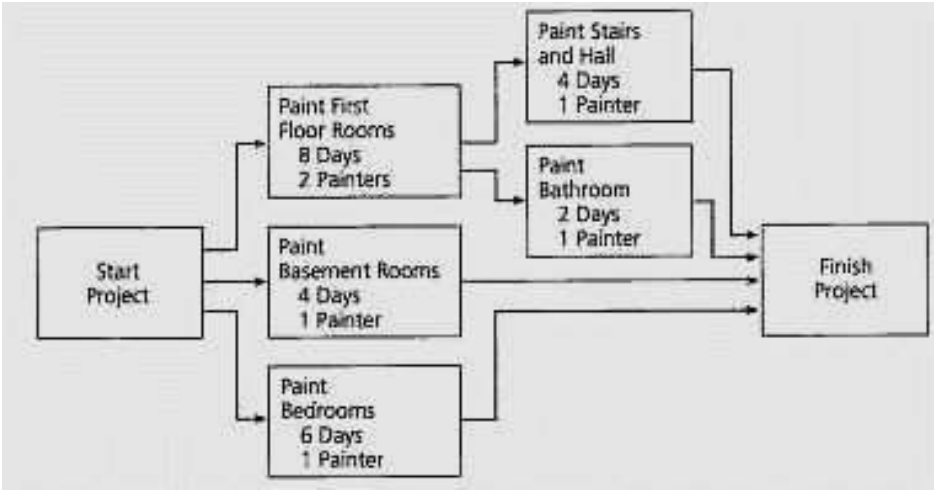
Northern Border University Faculty of Engineering First Semester 1435/1436, Final Term Exam		Subject: Project Management IE415 Date: 12/03/1436, Time allowed: 2 Hr. Total Marks: 30 Points Instructors: Dr. **Mohamed Mostafa**

Solve the Following Questions

Question #1: **(15 Points)**

Using the information in the following figure, determine how to level the resources



For each of the following scenarios,

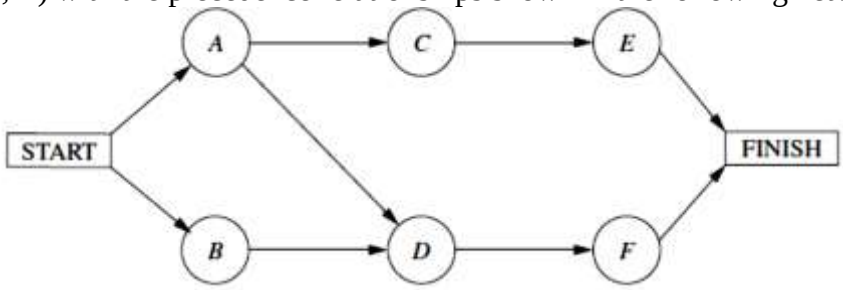
a) An unlimited number of painters
b) Only 2 painters available at any time

(Prepare a resource utilization chart and resource Profile that indicate how many painters are needed each day based on the earliest start and finish times for each activity).

Solve using one of the following heuristics: Minimum slack, smallest duration or lowest identification number.

Question #2: **(15 Points)**

10.6-2.* The P-H Microchip Co. needs to undertake a major maintenance and renovation program to overhaul and modernize its facilities for wafer fabrication. This project involves six activities (labeled *A, B, . . . , F*) with the precedence relationships shown in the following network.



Activity	Estimated Duration	Estimated Cost
A	6 weeks	$420,000
B	2 weeks	$180,000
C	4 weeks	$540,000
D	5 weeks	$360,000
E	7 weeks	$590,000
F	9 weeks	$630,000

(a) Find the earliest times, latest times, and slack for each activity. What is the earliest finish time for the completion of the project?

(b) Display the budget and schedule of costs based on earliest start times for this project on a single spreadsheet.

(c) Use results in part (b) to draw a figure to show the schedule of cumulative project costs when all activities begin at their earliest start times.

(d) After 4 weeks, activity *B* has been completed (with an actual cost of $200,000), activity *A* is 60 percent completed (with an actual cost to date of $200,000), and activity *D* is 50 percent completed (with an actual cost to date of $210,000). Construct a PERT/Cost report after week 4. Where should the project manager focus her attention to improve cost performances?

Question #3: **(5 Points)**

Match the following two groups

A	A project is resource constrained	in situations where the critical path is delayed and the addition of resources can bring the project back on schedule and the project completed by the required date	1
B	Resource definition	we attempt to ensure that the demand for resources does not exceed availability	2
C	Resource allocation,	addresses the problem of the optimum use and timing of the assignment of these resources to the various project activities	3
D	Resource aggregation	involves identifying the critical resources that need to be planned and managed for the successful completion of the project.	4
E	Resource leveling	involves determining the aggregate resources that will be needed, period by period, to complete all project activities.	5
F	A project is classified as time constrained	if the level of resource availability cannot be exceeded	6

Question #4: **(5 Points)**

Identify the choice that best completes the statement or answers the question.

1. Which is not a significant challenge of project scheduling?

a.	deadlines exist.	b.	activities are independent.
c.	many employees could be required.	d.	delays are costly.

2. The earliest start time rule

a.	compares the starting times of all activities for successors of an activity.
b.	compares the finish times for all immediate predecessors of an activity.
c.	determines when the project can begin.
d.	determines when the project must begin.

3. To determine how to crash activity times

a.	normal activity costs and costs under maximum crashing must be known.
b.	shortest times with crashing must be known.
c.	realize that new paths may become critical.
d.	All of the alternatives are true.

4. When activity times are uncertain,

a.	assume they are normally distributed.
b.	calculate the expected time, using (a + 4m + b)/6.
c.	use the most likely time.
d.	calculate the expected time, using (a + m + b)/3.

5. Which of the following is a general rule for crashing activities?

a.	Crash only non-critical activities.
b.	Crash activities with zero slack.
c.	Crash activities with the greatest number of predecessors.
d.	Crash the path with the fewest activities.