Northern Borders University Faculty of Engineering First Semester 1434/1435, Final Term Exam		Subject: Project Management IE415 Date: 05/3/1335, Time allowed: 2 Hr. Total Marks: 40 Points Instructors: Dr. **Mohamed Mostafa**

Solve the Following Questions

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

You have signed a contract to build a garage for the Simpsons. You will receive a $500 bonus for completing the project within 15 working days. The contract also contains a penalty clause in which you will lose $100 for each day the project takes longer than 15 working days.

Draw a project network given the information below. **Complete** the forward and backward pass, **compute** the activity slack, and **identify** the critical path.

Do you expect to receive a bonus or a penalty on this project?

ID	Description	Predecessor	Time (days)
A	Pour foundation	None	3
B	Erect frame	A	4
C	Roof	B	4
D	Windows	B	1
E	Doors	B	1
F	Electrical	B	3
G	Rough-in frame	C, D, E, F	2
H	Door opener	E, F	1
I	Paint	G, H	2
J	Cleanup	I	1

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

Consider the following Problem

Activity ID	Activity Description	Duration (Days)	IPA	Laborers
A	Excavation & Foundation	6	–	4
B	SOG	3	A	3
C	Framing	10	B	4
D	Plumbing	4	B	2
E	Electrical Wiring	3	C*	3
F	Drywall	5	C*	3
G	HVAC$ rough-in	3	C*	4
H	Roof	5	C	3
I	Paint	4	F	2

For each of the following scenarios, determine how to level the resources:

a) An unlimited number of laborers

b) Only 8 laborers available at any time

Question #3: **(10 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 critical path**

a.	is any path that goes from the starting node to the completion node.
b.	is a combination of all paths.
c.	is the shortest path.
d.	is the longest path.

3. **Activities K, M and S immediately follow activity H, and their latest start times are 14, 18, and 11. The latest finish time for activity H**

a.	is 11.	b.	is 14.
c.	is 18.	d.	cannot be determined.

4. **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.

5. **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.

6. **Activities G, P, and R are the immediate predecessors for activity W. If the earliest finish times for the three are 12, 15, and 10, then the earliest start time for W**

a.	is 10.	b.	is 12.
c.	is 15.	d.	cannot be determined.

7. **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.

8. **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.

9. **In deciding which activities to crash, one must**

a.	crash all critical activities.
b.	crash largest-duration activities.
c.	crash lowest-cost activities.
d.	crash activities on the critical path(s) only.

10. **For an activity with more than one immediate predecessor activity, which of the following is used to compute its earliest finish (EF) time?**

a.	the largest EF among the immediate predecessors.
b.	the average EF among the immediate predecessors.
c.	the largest LF among the immediate predecessors.
d.	the difference in EF among the immediate predecessors.