LEBANESE INTERNATIONAL UNIVERSITY

School of Engineering

Department of Industrial Engineering

Semester: Summer 2017

IENG300 – Engineering Project Management Midterm Solution

Question 1 (10 points):

In the table below, mark the following statements as either TRUE (T) or FALSE (F). If you change your answer, scratch previous one and clearly re-write the new one. Questions with a confusing answer will automatically get a zero mark. Wrong answers do not penalize correct ones. The weight for each question is 1 point.

1. Project management is exclusively a science that is only based on formulas, equations and mathematics.
2. Project management is an arbitrary methodology that lacks rules, principles, processes, procedures and methods.
3. A major portion of the project work, both physical and mental, takes place during the production stage of the Project Life Cycle.
4. Whether a matrix is weak or strong is determined by the extent to which the project manager has direct authority over project participants.
5. In an engineering project, it is possible to use both top-down (Macro) and bottom-up (Micro) techniques simultaneously to estimate the project costs..
6. The project network is developed from the information collected for the WBS and is a graphic flow chart of the project baseline plan.
7. The critical path is an activity that if delayed will delay the whole project.
8. In a conventional project lifecycle, as work progresses uncertainty about the expected outcome should increase.
9. Risk management teaches us to accept, ignore, reduce, or exploit risks.
10. Change management systems involve reporting, controlling and recording changes to the project baseline.

Question	1	2	3	4	5	6	7	8	9	10
Answer	**F**	**F**	**F**	**T**	**T**	**T**	**F**	**F**	**F**	**T**

Question 2 (30 points)

Choose the correct answer. Only one answer may be marked. Questions with more than one answer will automatically get a zero mark. Wrong answers do not penalize correct ones. The weight for each question is 2 points.

1. Which of the following constraints is **not** typically found in managing projects?
   a. Cost.
   b. Time.
   c. Performance.
   d. People.

2. Which of the following is **not** one of the characteristics of effective objectives?
   a. Realistic.
   b. Specific.
   c. **Flexible**.
   d. Measurable.

3. If a project is small or of narrow scope and does not require an elaborate WBS, which of the following is a good choice?
   a. Responsibility matrix.
   b. Organization breakdown structure (OBS).
   c. Work breakdown structure (WBS).
   d. Process breakdown structure (PBS).

4. The initial step in the risk management process is to:
   a. Determine the level of acceptable risk.
   b. Assess the risk potential.
   c. Identify the risks.
   d. Appoint a risk manager.

5. Which of the following elements is **not** normally common in projects?
   a. Uncertainty.
   b. An objective.
   c. Uniqueness.
   d. No defined end point.

6. Which of these is/are **utilized** in a project?
   a. Scope.
   b. Resources.
   c. Team.
   d. All of the above.

7. The functional organization project management structure has all the following disadvantages **except:**
   a. Lack of focus.
   b. Poor integration.
   c. Slow.
   d. Flexibility.

8. Project selection criteria are typically classified as:
   a. **Financial and non-financial**
   b. Short-term and long-term
   c. Strategic and tactical
   d. Required and optional.

9. Project managers:
   a. Focus on immediate customers rather than the market place and value chain.
   b. Engage in a never-ending search for perfection.
   c. Focus on problems that have low priority strategically
   d. **Manage project teams, customers, performance, trade-offs and risks.**

10. In order to overcome the power outage risk, Rami has decided to buy an electric generator for his house. The developed response by Rami will be classified as:
    a. **Mitigating risk.**
    b. Avoiding risk.
    c. Transferring risk.
    d. Retaining risk.

11. The project definition phase does not include:
    a. Defining the project scope.
    b. Establishing project priorities.
    c. Creating the work breakdown structure.
    d. **Developing schedule and budget.**

12. A technique to overcome the finish-to-start relationships of project network activities is:
    a. Remove long activities.
    b. Reduce project duration.
    c. **Use of lags.**
    d. Use of buffers.

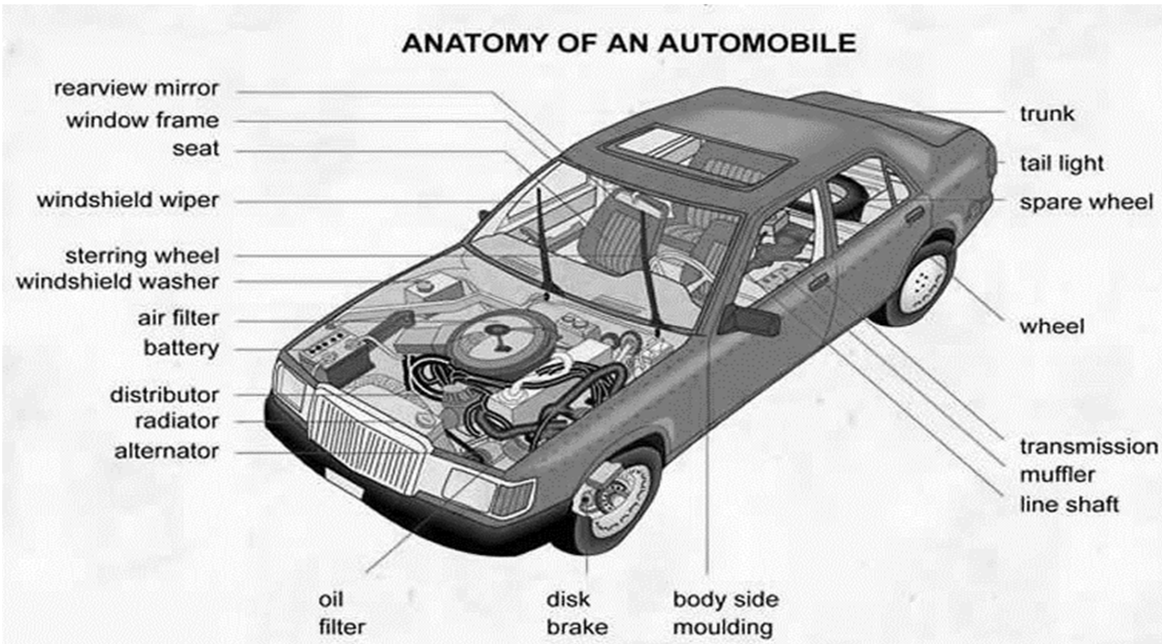
13. Which of the following techniques may **not** be used in the risk identification step?
    a. Risk breakdown structure.
    b. Brainstorming.
    c. **Scenario analysis.**
    d. Risk profiling.

14. The goal of the change management process is to:
    a. Control risks.
    b. Change bad employees.
    c. Be creative.
    d. **None of the above.**

15. Project risks are tracked and controlled using a:
    a. **Risks register.**
    b. Changes register.
    c. Severity matrix.
    d. Statement of work.

<u>Question 3 (15 points)</u>:

You are a project manager working in car industry. The Project Office (PO) asks you to lead a new project in manufacturing a car. The following diagram shows the anatomy of a car:



<u>Question 3 Solution</u>:

a. **Considering the car's engine, interior, control and electrical modules, Develop a minimum of three level work breakdown for this project. (10 Points)**

- Car
  - Engine
    - Alternator
    - Distributor
    - Oil Filter
    - Air Filter
  - Interior
    - Seat
    - Muffler
    - Line Shaft
  - Chassis
    - Body Side Molding
    - Window Frame
    - Trunk
  - Control
    - Transmission
    - Brake
    - Sterring Wheel
  - Electrical
    - Battery
    - Tail Light
  - Wheel

b. **At this point in time, do you have enough information to develop detailed work packages for this project? Justify your answer. (2 Points)**

At this point in time, there isn't enough information to develop detailed work packages for this project. In order to be able to do that, more information will be needed such as required resources, estimated time necessary to perform the task, estimated time for required resources, individuals responsible for performing the task, deliverables.

c. **How does a WBS help the PM? (3 Points)**

   a. Facilitates evaluation of cost, time and technical performance of the organization on a project.
   b. Provides management with info appropriate to each organizational level.
   c. Helps in the development of the organization breakdown structure (OBS). which assigns project responsibilities to organizational units and individuals.
   d. Helps manage plan, schedule and budget.
   e. Defines communication channels & assists in coordinating project elements.

Question 4 (25 points):

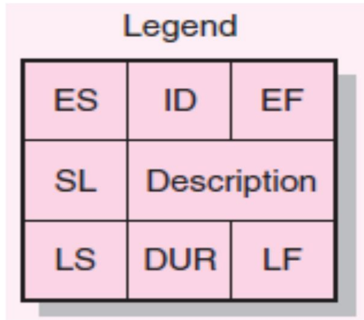
The project office (**PO**) of your company is asking you to:

a. Draw the Activity on Node (AoN) network. **(5 points)**
b. Calculate the early start (ES), early finish (EF), late start (LS), late finish (LF) and slack (SL). **(10 points)**
c. Identify the critical path (CP). **(3 points)**
d. How soon can the project be finished? **(2 points)**
e. Identify a major issue with this project network. Justify your answer. **(5 points)**

The activities time estimates and their dependencies are summarized in the following table:

Activity ID	Predecessor Activity	Duration (Weeks)
A	**None**	**5**
B	**A**	**4**
C	**B**	**4**
D	**B**	**3**
E	**B**	**3**
F	**C,E**	**2**
G	**D**	**4**
H	**F, G**	**4**

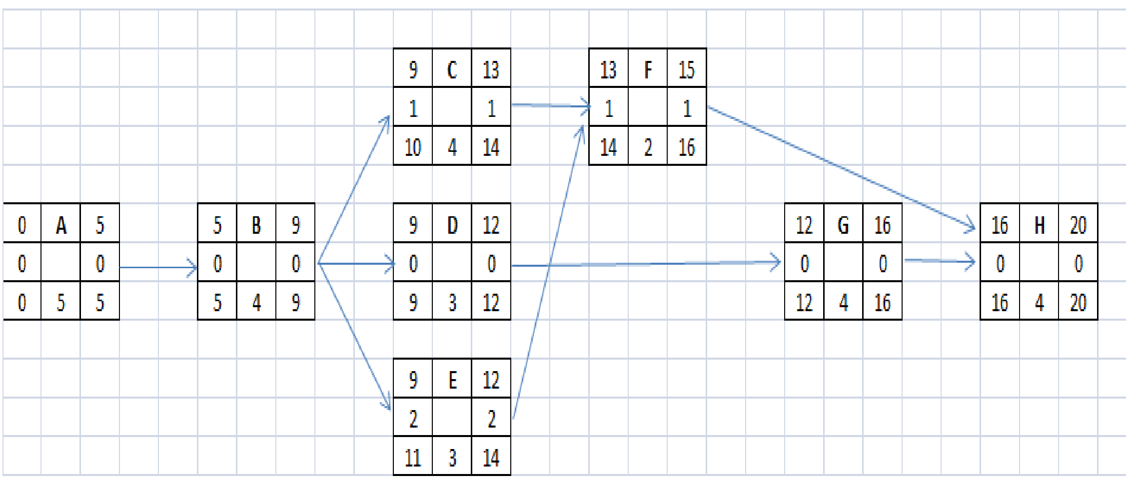
Use the following legend to represent the node:



Question 4 Solution

a. Draw the Activity on Node (AoN) network. **(5 points)**

b. Calculate the early start (ES), early finish (EF), late start (LS), late finish (LF) and slack. **(10 points)**



c. Identify the critical path (CP). **(3 points)**

The critical path is: A, B, D, G, H

d. How soon can the project be finished? **(2 points)**

The project can be finished in 20 weeks.

f. If activity A is delayed by 2 weeks, what would be the impact on the project? Why? **(5 points)**

The project will be delayed by 2 weeks since A is on the critical path.

Question 5 (20 points)

LIU Graduation Ceremony Project

You are assigned to manage LIU-Beirut graduation ceremony for the first time in your career. LIU-Beirut graduation ceremony is a yearly event that provides a great opportunity to the students to meet with all departments staff and graduates and express their joy of success.

Unlike previous events, this year event is going to be special and unique since more than 5000 students from different campuses will be present in the event along with their beloved ones. During the event you are going to be responsible for the wireless connections, live broadcasting, electrical related devices and equipment, internet, laser lights, and sound systems; in addition to some other logistic tasks.

The event must start at 5:00 pm on Thursday, 28 December, 2017 with a special laser lights welcoming the audience and end at 8:00 pm with special music.

Question 5 Solution

a. Why should you consider this graduation ceremony a project? Justify your answer. **(3 points)**

   It is considered as a project since it provides non-repetitive and new unique services to the students and to the university's staff. Its start and end are well-defined along with expected tangible deliverables.

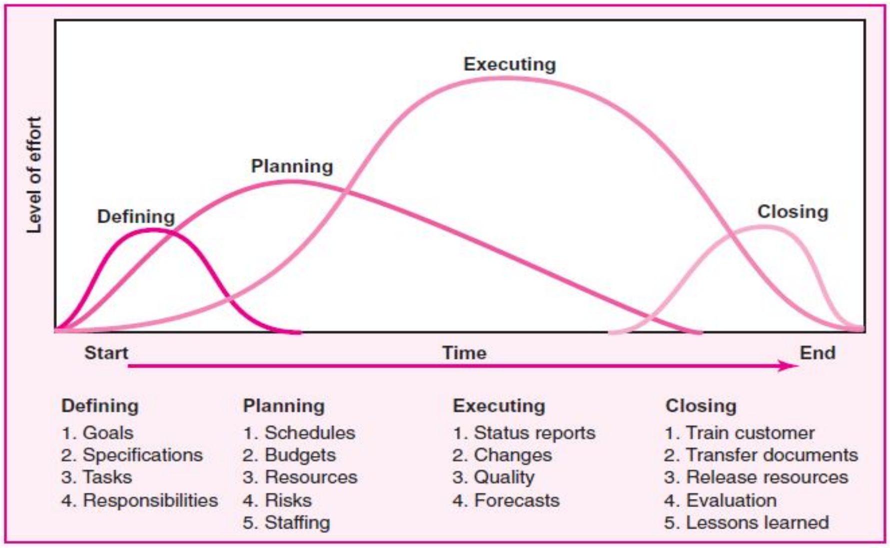
b. Identify three valid deliverables of this project? **(3 points)**

   1. The actual ceremony and its related activities (laser lights, sound systems, etc.)
   2. SoW to be sent to the LIU Beirut Campus.
   3. Documentations: Registration forms, maps, Flyers, etc.
   4. Project plan, time lines, Gantt chart
   5. Status reports
   6. PRCF

c. What are the PLC (Project Life Cycle) phases of this project? Which phase would take the most time? **(5 points)**

   1. Defining
   2. Planning
   3. Executing
   4. Closing

Executing is most time consuming one.



d. Identify three risk events that might impact the scope, cost, time, or quality of your project. **(3 points)**

Risk id	Risk Description
R1	Overload or Power outage during the event.
R2	Communication problems: Slow Internet, live broadcast issues, etc.
R3	Security and safety problems.

e. After identifying your risks, you need to use the impact, likelihood, and response matrix of the threes risks you mentioned. **(6 points)**

Risk ID	Likelihood	impact	Risk Response
R-1	8	9	**Mitigating: Generators**
R-2	4	6	**Transferring: Get alternative companies to deal with backup solution that can guarantee solid reliable communication.**
R-3	4	9	**Transferring: Hire reliable medical and security teams that can keep the area safe and secure in addition to local authorities.**