King Saud University

College of Computer and Information Sciences
Computer Science Department

Course Code:	**CSC 342**	
Course Title:	**Software Engineering**	
Semester:	**2nd 2016**	
Exercises Cover Sheet:	**MID2 Exam**	**90 Minutes**

Student Name:	.....
Student ID:	.....
Department Name:	.....

Tick the Relevant	Computer Science B.Sc. Program ABET Student Outcomes	NCAAA Outcomes	Question No. Relevant Is Hyperlinked	Covering %
	a) Apply knowledge of computing and mathematics appropriate to the discipline;	**1.1**		
√	**b) Analyze a problem, and identify and define the computing requirements appropriate to its solution**	**2.1**		
√	**c) Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;**	**2.2**		
√	**d) Function effectively on teams to accomplish a common goal;**	**3.1**		
√	**e) Understanding of professional, ethical, legal, security, and social issues and responsibilities;**	**1.2**		
	f) Communicate effectively with a range of audiences;	**4.1**		
	g) Analyze the local and global impact of computing on individuals, organizations and society;	**2.3**		
	h) Recognition of the need for, and an ability to engage in, continuing professional development;	**2.4**		
√	**i) Use current techniques, skills, and tools necessary for computing practices.**	**1.3**		
	j) Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;	**1.4**		
√	**k) Apply design and development principles in the construction of software systems of varying complexity;**	**1.5**		
√	**General Question**	**-----**		

Question #1:

Circle the most appropriate answer(s)
[/ 6 Points]

1. Which UML diagrams has more emphasis on flow of messages among objects?
   a) Collaboration diagram
   b) Activity diagram
   c) Class diagram
   d) Object diagram

2. Which of the following items does not appear on a CRC card?
   a) class collaborators
   b) class name
   c) association multiplicity
   d) class responsibilities

3. The object diagram
   a) depicts relationships between data objects
   b) depicts the data flow among the objects
   c) indicates how data are transformed by the system
   d) indicates system reactions to external events

4. Among the main characteristics of a project:
   a) have certain outcomes
   b) persistent
   c) have multiple clear objectives
   d) needs resources

5. Which model in system modelling depicts the static nature of the system?
   a) Functional Model.
   b) Domain model
   c) Behavioral Model.
   d) All of the above

6. Which of the following is not a project manager's activity?
   a) project control
   b) project management
   c) project planning
   d) project design

Question #2:

Indicate whether each of the following statement is "true" or "false". Justifying any "false" choice
[/ 10 Points]

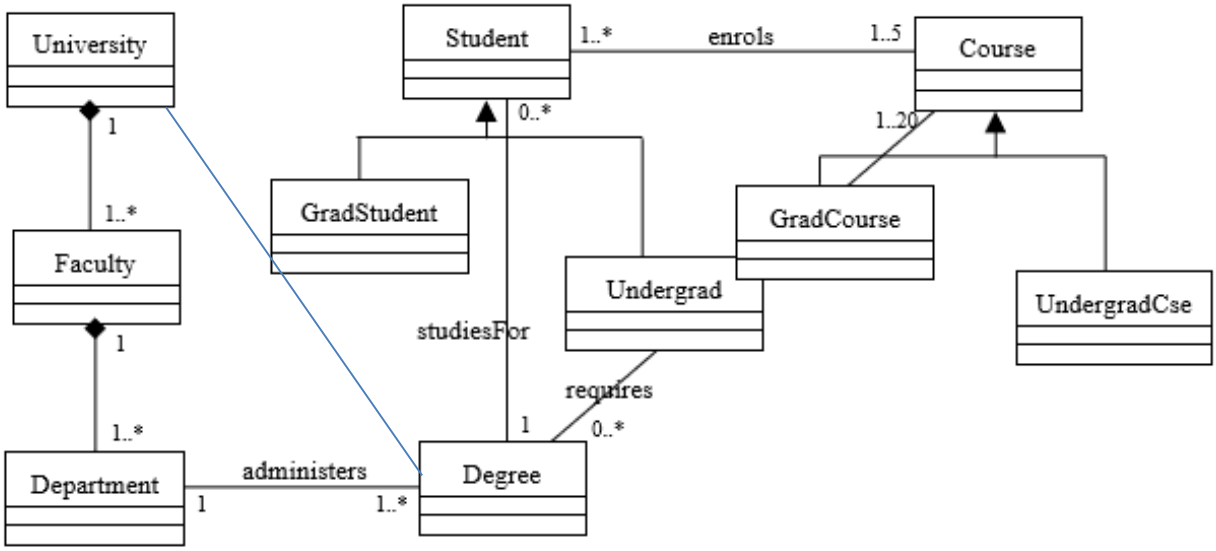
Statement	Answer [T / F]
1. Deliverables are usually milestones but milestones need not be deliverables.	**T**
2. Productivity is not proportional to the number of people working on a project.	**F**
3. Category list is useful to identify conceptual class ~~noun phrases~~.	**F**
4. Plans must be regularly revised as new information becomes available.	**T**
5. A domain model is concerned with the system internal ~~external~~ behavior.	**F**
6. At each milestone there should be a formal software test. This is not necessarily	**F**
7. A conceptual class does not shows how the methods would be implemented by the software system.	**F**
8. Project planning is the longest activity among the project management activities.	**T**
9. Adding people to a late project makes it later because of the ~~increased cost~~ communication overhead.	**F**
10. It is good for project manager to always allow contingency in planning.	**T**

Question #3:

A university offers degrees to students. The university consists of faculties each of which consists of one or more departments. Each degree is administered by a single department. Each student is studying towards a single degree. Each degree requires one to 20 courses. A student enrols in 1-5 courses (per term.) A course can be either graduate or undergraduate, but not both. Likewise, students are graduates or undergraduates but not both.

Draw a class diagrams which represents the above system. Make sure to specify multiplicities for all associations shown in your diagrams.

[/ 16 Points]

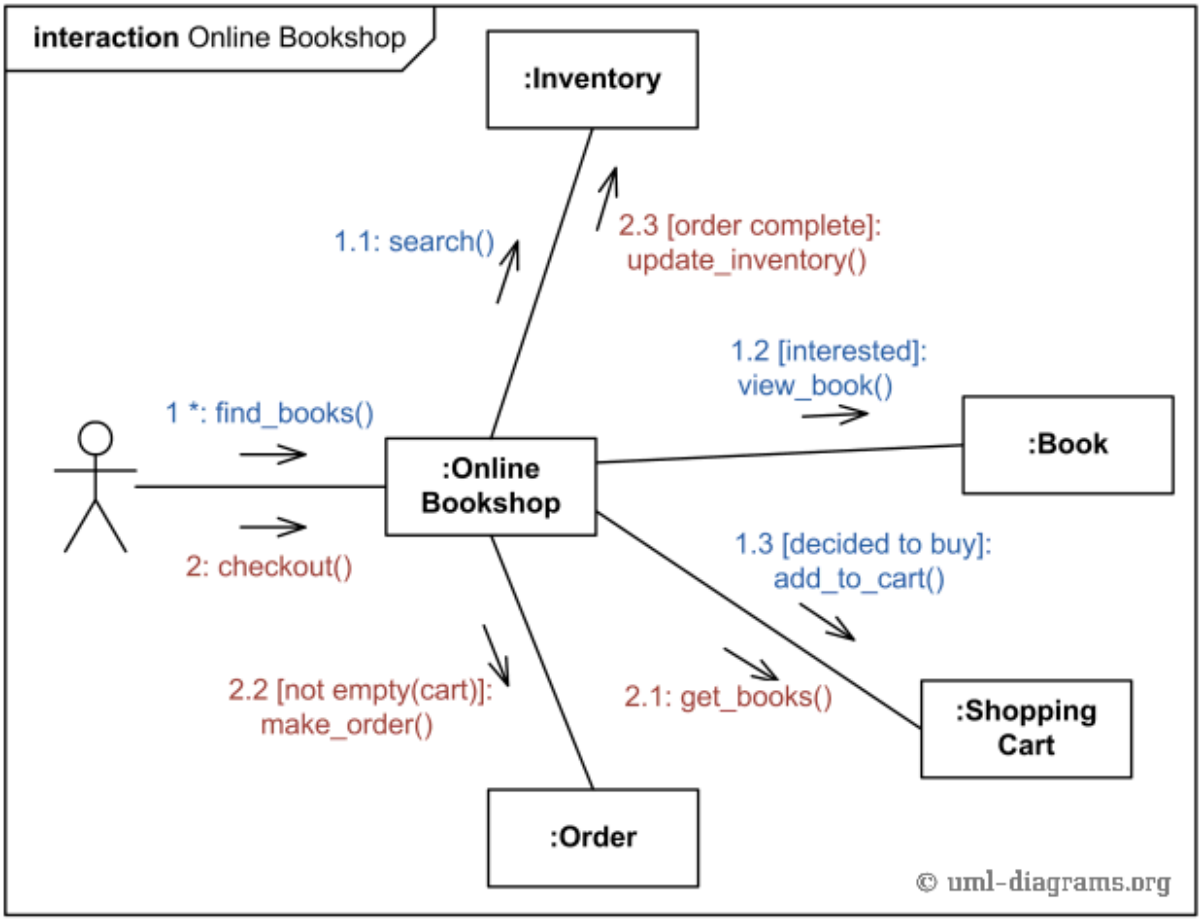


Question #4:

In the Online Bookshop system, the Communication starts with the user requesting a certain book. Client searches inventory of books, and if he/she is interested in some book he/she can view description of the book. If client decides to buy, he/she can add book to the shopping cart. Checkout includes getting list of books from shopping cart, creating order, and updating inventory, if order was completed.

Draw a collaboration diagram for the above Online Bookshop **system.**

[/ 12 Points]



Question #5:

Using the information in the table below, assuming that the project team will work a standard working week (5 working days in 1 week) and that all tasks will start as soon as possible:

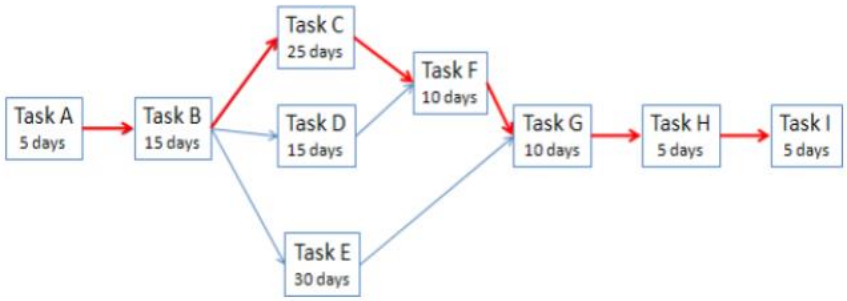
[/ 16 Points]

Task	Description	Duration (Working Days)	Predecessor/s
A	Requirement Analysis	5	
B	Systems Design	15	A
C	Programming	25	B
D	telecoms	15	B
E	Hardware Installation	30	B
F	Integration	10	C, D
G	System Testing	10	E, F
H	Training/Support	5	G
I	Handover and Go-Live	5	H

a) Draw the activity network of this project showing the slack of each activity

[/ 10 Points]

(b) (i) The critical path of the project can be ascertained as follows:



The critical path runs through Tasks, A, B, C, F, G, H and I.

(3 marks)

(ii) The sum of the critical task durations is 75 days - therefore the planned duration of the project is 15 weeks.

(3 marks)

If 75 days is stated award (2 marks).

(iii) Task D is non-critical with 10 days (2 weeks) float
Task E is non-critical with 5 days (1 week) float
Award 1 mark for identifying each task and 1 mark for the correct calculation of float in each case.

b) State the critical path of the project [/ 2 Points]

The critical path runs through Tasks, A, B, C, F, G, H and I.

(3 marks)

c) Calculate the planned duration of the project in weeks [/ 2 Points]

(ii) The sum of the critical task durations is 75 days - therefore the planned duration of the project is 15 weeks.

(3 marks)

If 75 days is stated award (2 marks).

d) If you were the project manager, and you were requested to finish in a shorter time than the planned duration. State two general approaches that you may follow to achieve this goal [/ 2 Points]

- Pruning critical path activities (cutting some of them if possible)
- "Fast tracking" (performing more activities in parallel)
- "Crashing the critical path" (shortening the durations of critical path activities by adding resources)

	Result					
Question No.	**Relevant ABET Student Outcome**	**Relevant NCAAA Student Outcome**	**SO is Covered by %**	**Full Mark**	**Student Mark**	**Assessor's Feedback**
Ex. 1						
Ex. 2						
Ex. 3						
Ex. 4						
Ex. 5						
Totals			**100%**	**15**		
	I certify that the work contained within this assignment is all my own work and referenced where required. **Student Signature:** **Date:**					**Feedback Received:** **Student Signature:** **Date:**