ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION   SUMMER SEMESTER, 2021-2022
DURATION: 1 HOUR 30 MINUTES   FULL MARKS: 50

CSE 4407: System Analysis and Design

Programmable calculators are not allowed. Do not write anything on the question paper.
Answer **all 3 (three)** questions. Figures in the right margin indicate full marks of questions whereas corresponding CO and PO are written within parentheses.

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1. a) Define the seven phases of the systems development life cycle (SDLC).   7 (CO1) (PO1)

   b) Define tangible and intangible costs and benefits with examples.   4 (CO1) (PO1)

   c) Define technical, económic, and operational feasibility.   6 (CO1) (PO1)

2. a) The music platform, **gtunes** from **Mapple**, is undergoing a migration process from its outdated technology to a new, innovative solution. Table 1 shows the revenue (in $USD) expected for the first four years of operation, in addition to the costs (in $USD) for development, operation, and so on.
   Using cash-flow analysis, determine the year when **Mapple** is expected to show a profit.   9 (CO1) (PO1)

Table 1: Cash flow of the new system by year for Question 2 (a)

	Year 1	Year 2	Year 3	Year 4
Revenues				
Sales from music download	-	70,000	1,00,000	2,00,000
Customer subscription	-	1,50,000	2,00,000	2,50,000
Revenues from ads	-	1,50,000	2,00,000	3,00,000
Costs				
Development Costs				
Analysis and Design	42,000			
Development	1,20,000			
Software	25,000			
Hardware	50,000			
Operational Cost				
Employee Salary	2,00,000	2,50,000	2,75,000	2,90,000
Software License		15,000	15,000	15,000
Software Upgrades		15,000	5,000	5,000
Hardware Upgrades		20,000	5,000	5,000
Promotions	10,000	5000	5,000	5,000

   b) Following **gtunes,** another popular music platform **Spootify** wants to upgrade their system to a newer technology. The present system's cost and the proposed system's cost (in $USD) of **Spootify** is given in Table 2:
   Using break-even analysis, determine the year in which **Spootify** will break-even.   8 (CO1) (PO1)

Table 2: Proposed System costs and Present System costs by year for Question 2 (b)

	Proposed System Cost	Present System Cost
Year 1	84,000	64,500
Year 2	69,400	68,800
Year 3	60,900	74,100
Year 4	64,500	80,500

3. a) Cherry Jones owns a homeopathic medicine company called **Faithhealers**. She sells vitamins and other relatively nonperishable products for those who want choices regarding alternative medicine. Cherry is developing a new system that would require her staff to be retrained. Given the information in Table 3, draw a **GANTT** chart and identify the task that will take the most time to finish with proper justification.   6 (CO2) (PO1)

Table 3: Dependency table of tasks for Question 3 (a, b, c)

Task Description	Task	Must Follow (Predecessor)	Time (Weeks)
Interview executives	A	None	6
Interview staff in order fulfillment	B	None	3
Design input prototype	C	B	2
Design output prototype	D	A, C	3
Write use cases	E	A, C	4
Record staff reactions to prototypes	F	D	2
Develop system	G	E, F	5
Write up training manual	H	B, G	3
Train staff working in order fulfillment	I	H	2

b) Given the information in Table 3, draw a **Pert Diagram** and indicate the **critical path** that will take the most time with proper justification.   6 (CO2) (PO1)

c) Given the information in Table 3, prepare a **Critical Path Method (CPM) Diagram** and indicate the **critical path** that will take the most time with proper justification.   4 (CO2) (PO1)