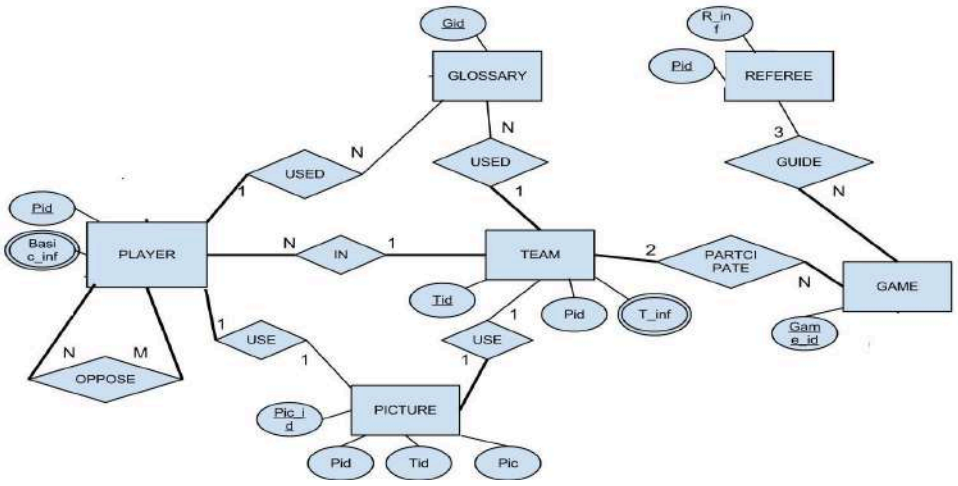
United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

Mid Term Exam, Trimester: Spring 2025
Course Code: CSE-3521, Course Title: Database Management Systems
Total Marks: 30, Duration: 1 hour 30 minutes

Any examinee found adopting unfair means will be expelled from the trimester / program as per UIU disciplinary rules.

1.	a) What do you understand by a partial key or discriminator? Do you think descriptive attributes and mapping cardinalities are related in some aspects? Justify your answer with proper explanation. b) Draw an ER diagram for the following requirements to create a Virtual Reality Fitness System. The system allows users to create and manage personal profiles. Users can input information such as fitness goals, current physical metrics (e.g., weight, height), and preferences for workout styles (e.g., cardio, yoga, or strength training). The system should personalize fitness recommendations based on these inputs. The platform offers a variety of fitness programs that users can browse and select from. Each program caters to specific fitness goals (e.g., weight loss, muscle building, relaxation) and adjusts to different difficulty levels. Programs are designed by virtual trainers and provide structured workout sessions, ensuring users stay on track. The system includes virtual trainers that guide users during their workouts. These trainers provide instructions, monitor progress during sessions, and offer encouragement. Virtual trainers are specialized in areas such as cardio, yoga, or strength training, ensuring users receive expert guidance for their chosen program. The system motivates users by offering achievements for reaching specific milestones, such as completing a certain number of sessions or burning a set amount of calories. Users earn reward points for these achievements, which can be displayed as badges or trophies to celebrate their progress. To foster motivation and friendly competition, the system features leaderboards where users can compare their performance with others. Rankings are based on reward points, session consistency, and program completion rates, encouraging users to stay engaged.	2+7 = 9

2.	Draw the corresponding schema diagram for the ERD below, 	7
3.	**Given Schema:** Hero (hero_id(pk), hero_name, real_name, species, homeworld) Team (team_id(pk), team_name, leader_id(fk), headquarters) Mission (mission_id(pk), mission_name, location, date, success) Assignment (hero_id(fk)(pk), mission_id(fk)(pk), role) **Find the relational Algebra for the followings** a) Find the names of all heroes who are from Earth. b) List the names of all Avengers who have participated in at least one mission. c) Find the names of team leaders whose teams have their headquarters in Wakanda.	1+1+ 2
4.	**Consider the given schema** JobSeeker (seeker_id(pk), name, email, skill, experience_years, location) Recruiter (recruiter_id(pk), name, company, email, industry, location) JobPost (job_id(pk), recruiter_id(fk), title, description, salary, location, posted_date, application_deadline) Application (app_id(pk), seeker_id(fk), job_id(fk), status, applied_date) Interview (interview_id(pk), app_id(fk), date, time, status, feedback) Company (company_id(pk), name, industry, headquarters, employee_count) **Write the SQL queries for the following:** a) Write an SQL query to create the JobPost table where title, description, and location must not allow NULL values. b) Add a new column company_id to the Recruiter table to store the company each recruiter is associated with and ensure that it references the Company table. c) Find the names and emails of job seekers who have more than 5 years of experience and are skilled in Python. d) Find the companies who have posted more than 10 job listings. e) Retrieve the job title and number of applications for each job, displaying the results in descending order of applications.	2+2 +2+ 2+2