**Python and OOP (Theory-02) Answer Script**

| Question No. 01` |
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| Answer:  Traffic control system for 3 lights (RED, GREEN, YELLOW):   1. When the Red light is ON, all kinds of traffic should be stopped. It will stay ON for 30 seconds. 2. After 20 seconds. The yellow light will be ON along with the RED light for 10 seconds. This means drivers should get ready to drive, GREEN light will be ON within 10 seconds. 3. After 10 seconds (total of 30 seconds) the RED and YELLOW lights will be OFF and the GREEN light will be on for 30 seconds. Drivers now can cross the intersection. 4. After 20 seconds the YELLOW light will be ON for 10 seconds along with the GREEN light. This means running drivers should be prepared for the RED light because it will be ON within 10 seconds. 5. After 10 seconds (total of 30 seconds), both GREEN and YELLOW lights will turn OFF and the RED light will turn ON and drivers should stop their cars. 6. There will be a CCTV system at the intersection that will capture photos of the vehicles if they violate and RED or GREEN light and send the information to the monitoring Admin database which can only be accessed by the Admin. |

| Question No. 02 |
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| Answer:  “Amare Loiya Jao Majhi” ride-sharing app **required features**:   1. There must be at least one driver and one passenger for this system to work. 2. Passengers and drivers both need to log in with a password (after authentication) and new users, need to create an account with email and then log in. 3. All account and login information are saved in a database and can only be accessed by the system Admin. 4. After login, a passenger will input her trip details (ride type, pick-up location, destination, and the number of passengers with her) and a payment method (mobile banking/ debit or credit card/ cash) in the app and the total amount of money that needs to be paid will be displayed on the app.   Then she can request a trip. There will also be a ride cancellation button at any time in the passenger app.   1. If there is any “available” driver nearby and if he accepts the request, a notification will be sent to the passenger app and to the admin panel too. The driver’s status is now set to “busy”. 2. During the ride, both the driver’s and the passenger’s GPS location will be tracked from the Admin panel. 3. After reaching the destination, the driver will stop the ride, and the passenger will pay him and she can rate the ride experience. The driver’s status will turn to “available” and “Amare Loiya Jao Majhi” company will get its commission.   **Possible common problems:**   1. Smart phone with an active internet connection is always required from the start to the end of the trip. 2. All passenger and driver information is saved in a database on the Admin side, so if the Admin panel’s security is breached, all information can fall into the wrong hands. 3. Driver can’t see the destination before starting the ride, so he may force the passenger to stop the ride if he doesn’t agree to the destination. 4. Also, drivers may not agree with the payment method, most of the drivers prefer cash payments, and on the contrary passengers like non cash payments. |

| Question No. 03 |
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| Answer:  **Required features for a forum like “stack overflow”:**   1. A user needs to log in with a password and new users, need to create an account with email and then log in. 2. At first the user will build her profile with her academic profile and fields of interest. 3. Questions and answers from users will be sorted and stored according to tags (like #c for loop, # python list, etc.) and saved in the database. Tags will make it easier to store and also can find relevant answers faster. 4. A user will be able to search for any topic according to tags or by writing a specific question. If there is more than one answer to her question, answers will be shown on the right side. 5. Users can also add answers to a question and “upvote” or “downvote” to already given answers. More upvote means the answer is more relevant to that particular question, on the contrary, more downvote means, the answer is not relevant or incorrect. Users will be able to edit their own comments too. 6. For irrelevant or explicit commenting, a user may be temporarily banned. 7. The Admin can remove any user or any comments if required.   **Common problems:**   * + - 1. The database has a finite capacity, so it must be upgraded regularly because the volume of questions and answers may increase over time.       2. Admin panel security is the most important part of the system, otherwise hackers can hack into the system and misuse user information.       3. Hackers may flood the system with irrelevant questions so there must be a defensive mechanism so that a user cannot post more than 10 questions per day.       4. Users may face abusive or racist comments from other disturbing or unkind users. There will be system to detect such cases. |

| Question No. 04 |
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| Answer:  **Features:**  1. This game requires at least 3 participants to attend, two will make the barrier, and others will jump over the barrier.  2. Participants must touch their feet against each other and hold that position till the end of the game.  3. There must have enough space for participants to run before the jump because the barrier height will increase over time and so more running space is required.  4. During the jump, the persons who are making the barrier, must hold still so that their movement does not distract the jumping participants.  5. Participants can not touch the barrier during jump to qualify for the next round.  6. Participants who successfully complete each round will celebrate at the end of the game.  **Possible problems:**  1. There must be a pre-qualifying round to determine who will jump and who will make the barrier. Otherwise indiscipline can arise in determining the serial.  2. if the running space is short, participants will not be able to pass the barrier.  **User Interaction:**   * + - 1. This game requires at least 3 people to attend. Two people make the barrier with their hands and another person jumps over their hands.       2. At first two participants will touch their feet against each other, this is the base. Then person 1’s one hand (ex. Right hand) will be put on their feet vertically to make a barrier, this is the base height. Then other participants will jump over the barrier. If participants can successfully complete the jump without touching their feet, then they will be eligible for the next round. Otherwise, he/she will be disqualified.       3. After one round, then person 2’s right hand will be put on the previous structure.   Again qualified participants from round 1, will jump over the new height.   * + - 1. After the second round again participant 1 will place her left hand on the barrier and the process continues.       2. In the last round, participant 2 will put her left hand on the barrier, and at this stage, the barrier height is at the maximum level.       3. Successful participants who can clear all the levels, will now celebrate by jumping over both legs of the barrier persons and say, “ইচিং বিচিং চিচিংছা প্রজাপতি উড়ে যা”.       4. If needed the game will now restart from the beginning. |

| Question No. 05 |
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| Answer:  Three major components of system design are,  1. Quality: Maintaining an acceptable quality of the system is the most important part of system design. No matter how low the expense is, quality is the primary quality.  2. Timeliness: System must be online in time, no matter how good a system is, if it cannot be used in time, its primary target may not be achieved.  3. Cost-effectiveness: System must be cost-effective, otherwise its funding may not cover all the expenses to make the system fruitful. |

| Question No. 06 |
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| Answer:  Of all the qualities, the **three most significant skills that a system designer should have** are mentioned below:  1. Analytical skill: A system designer should have great analytical thinking power so that he can approach a problem in a systematic way and select the most efficient way to solve that problem.  2. Technical knowledge: An efficient system designer should have good technical knowledge of information technology and programming techniques including different programming languages and DSA.  3. Leadership: Most software development requires different teams, where each team performs different tasks. A good system designer should consider each team’s capacity and capability during designing the system so that the whole project can be completed within the given time frame. |

| Question No. 07 |
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| Answer:  A step-by-step procedure to solve a particular problem is called an algorithm. This is a way or sequential process by which one can reach the solution of a problem. |

| Question No. 08 |
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| Answer:  1. Program documentation: this is a well-documented guide for the programmers to complete different modules of the whole system, this also helps in future debugging and maintenance.  2. System documentation  3. Operations documentation: this document contains all the information required to process and generate output results. This also holds error message codes for technical persons.  4. User documentation: this contains a short overview of the system for the operator to get an idea of the system. This can also be used to train new persons. |

| Question No. 09 |
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| Answer:  A top-down approach also known as decomposition is the breaking down of a whole system to study its constitutional components inside. To analyze a complex system, the whole system is divided into smaller subsystems or operations until a unit system is achieved which can be solved easily compared to the whole system. |

| Question No. 10 |
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| Answer:  The open-source licensing system is a system in which an existing code developed by someone can be used, modified, or integrated into another system by someone else.such as the browser Mozilla firefox.  **Importance:**  1. One can build a larger system based on an existing system, this reduces the cost and time of the development.  2. As the same code is used by many developers, this ensures code reliability.  3. Since the license is free, developers can use and modify it freely and maybe make more efficient code.  4. For newcomers, they can study and learn how a particular code works and its inner modules. |

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THE END