



KEEPING MOBILE PHONE/SMART WATCH, EVEN IN 'OFF' POSITION, IS TREATED AS EXAM MALPRACTICE

Answer ALL Questions

(10 X 10 = 100 Marks)

CASE STUDY: TNPDS Smart Ration Card - As a citizen of Tamil Nadu, you must get your smart card or ration card. These are very important for your whole family. There are a total of 5,80,298 holders in the entire Tamil Nadu, who are provided with all the facilities of ration card. Through the ration cards, people who have less income, can buy food items for two times. This portal has also launched by Tamil Nadu PDS and only residents of Tamil Nadu can avail it.

Features: Ration Card Status, Apply Online, Download, Updates and others details can be checked from the official website.

The following documents are required while applying online for the digital ration card in Tamilnadu:

Aadhar Card, Pan Card, Recent Passport Size Photo, Bank passbook, Caste/Category certificate, Income certificate, Electricity bill you can also download a Play Store app and apply for the card through the mobile application.

1. For the above mentioned **case study "TNPDS Smart Ration Card"** requires some changes in the functionalities in the existing system. As per the new requirements, the project is modified without disturbing the ongoing system that means this project doesn't have explicit constraints, timelines, or available resources; Note: The requirements are not very clear as the mentioned project has different types of requirements according to the region. And certain details from citizens' feedbacks aren't known and it is not collected from the outset and it looks very clear that requirements are changing quickly.

According to the situation identify the suitable software process model for developing/modifying the "TNPDS Smart Ration Card" application. Justify in detail the activities involved in software construction.

2. "This model is just like the one-way street. Once phase X is completed and next phase Y has started then there is no way to go back to the previous phase." – Relate the software process model from this quote & explain its advantages and disadvantages with suitable example.

3. Prove that "The Requirement Engineering (RE) is the most important phase of the Software Development Life Cycle (SDLC). This phase is used to translate the imprecise, incomplete needs and wishes of the potential users of software into complete, precise and formal specifications".
Perform the requirement analysis for "TNPDS Smart Ration Card" application with the required steps in detail.
4. Build the scenario based elements and class-based elements for "TNPDS Smart Ration Card" system with relevant notations.
5. Assume that you are going to create a "Student" object as a model. "Student View" will be a class which can print student details on console and "Student Controller" is a class responsible to store data in "Student" object and update "Student view" accordingly – For this scenario apply the suitable design pattern or architectural style and explain with suitable diagrams.
6. Consider the given program that checks if a number is a prime or not. For the following program, draw the Control Flow Graph and Calculate the Cyclomatic complexity using any one method and list all the independent paths.

```
int main()
{
    int n, index;
    1  printf("Enter a number: " );
    2  scanf("%d", & n);
    3  index = 2;
    4  while (index <= n - 1)
    5  {
    6      if (n % index == 0)
    7      {
    8          printf( "It is not a prime number");
    9          break;
    10     }
    11     index++;
    12 }
    13 if (index == n)
    14     printf("It is a prime number");
    15 }
```

7. Quote the differences between "White Box Testing", "Black Box Testing" and "Grey Box Testing" with relevant examples.

8. Given the following values, compute function point, productivity, documentation, cost per function when all complexity adjustment factor (CAF) and weighting factors are average.

User Input = 50

User Output = 40

User Inquiries = 35

User Files = 6

External Interface = 4

Effort = 36.9 p-m

Technical documents = 265 pages

User documents = 122 pages

Cost = \$7744/ month

9. Develop the risk table for the case study "TNPDS Smart Ration Card" system and explain how the risk impact is assessed with an example from scenario.

10. As the software engineering community develops new model-driven approaches for representation of the system requirements and design, illustrate the characteristics to be addressed. Also propose six ideas based on **Conradi and Fuggetta** to suggest possible process trends in software markets.

