

# लोक सेवा आयोग

नेपाल विविध सेवा, राजपत्रांकित तृतीय श्रेणी (प्राविधिक)  
कम्प्युटर इञ्जिनियर पदको प्रतियोगितात्मक लिखित परीक्षा

मिति: २०८०/११/३०

समय: ३ घण्टा

पूर्णाङ्क: १००

पत्र: द्वितीय

बिषय: Technical Subject

तलका प्रश्नहरूको उत्तर Section अनुसार छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नुपर्नेछ।

## Section – A

25 Marks

1. Design a mod 3 synchronous counter. 5
2. Define DNS. What are the types of DNS server and DNS records? Explain. Write down the differences between software interrupts and hardware interrupts. 2+4+4=10
3. Explain the error detection and correction techniques used in data communication. Also, describe transistor as an amplifier with appropriate diagram. 5+5=10

## Section – B

25 Marks

4. Describe crash recovery technique in database management system. 5
5. Define data structure and mention its importance. Explain the types of structured data types with example. 2+4+4=10
6. What is a process? Explain the use of inter process communication. Discuss the properties of transaction. 2+4+4=10

## Section – C

20 Marks

7. What are the basic subsets of Artificial Intelligence (AI) field? What are the pros and cons of AI? Describe the components of general heuristic search problem. Explain the automated reasoning in AI. 2+2+3+3=10
8. What is compiler? List the various phases of compiler and explain them. Explain the encryption and decryption process with an example. 2+4+4=10

## Section – D

30 Marks

9. Write a technical proposal considering the following scenario. Assume that you are responsible for selecting a new DBMS product for a group of users in your organization. To understand this you must first establish set of requirements for the group and then identify a set of features that a DBMS product must provide to fulfill the requirements. In your proposal you must mention the process of evaluating and selecting the best DBMS product as well as cost estimation. 10

10. Describe domain model with its necessary components. List out steps to draw domain model and describe each steps and construct domain model with respect to outlined steps for following case study.

Patients are treated in a single ward by doctors assigned to them. Healthcare assistants also attend to patients, a number of these are associated with each ward. Each patient is required to take a variety of drugs a certain number of times per day and for varying lengths of time. The system must record details concerning patient treatment and staff payment. Some staffs are paid part time and doctors and healthcare assistants work varying amounts of overtime at various rates. The system will also need to track what treatments are required for which patients. There is a need of remodeling the system which should be aligned with the current trend of technology tools. The reasons should be well presented in order to convince the related stakeholders. Describe current challenges.

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