

# प्रदेश लोक सेवा आयोग

## गण्डकी प्रदेश

इन्जिनियरिङ सेवा, सिभिल समूह, जनरल, इरिगेशन र स्यानिटरी उपसमूह, अधिकृत सातौ तह, इन्जिनियर पदको  
(अन्तर तह, खुला तथा समावेशी) प्रतियोगितात्मक लिखित परीक्षा

परीक्षा मिति: २०८०/०५/२०

समय: ३ घण्टा

पत्र: द्वितीय

पूर्णाङ्क: १००

निम्न प्रश्नहरूको उत्तर Section अनुसार छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नु पर्नेछ, अन्यथा उत्तरपुस्तिका रद्द हुनेछ।

### Section-A

1. Briefly describe the design considerations for column. (5)
2. Mention the factors affecting compaction. (5)
3. Define and differentiate between compaction and consolidation of soil mass. Write down assumptions for Terzaghi's one dimensional consolidation theory. (5+5)
4. Compare the concepts behind the working stress and limit state design of concrete structures. What type of "limit states" are considered in the limit state design approach? (7+3)

### Section-B

5. What are the assumptions of unit hydrograph? Describe the limitations of unit hydrograph. (3+2)
6. Explain the different terms in the Bernoulli's Equation. What assumptions must be met for this equation to be applicable? How can it be applied in using a Pitot tube? (4+3+3)
7. Despite the huge potential of horticulture and vegetable farming in the mild-hills cannot be achieved due to shortage of irrigation, please suggest the appropriate methods of irrigation system to be adopted. Can it be tied with reservoir hydropower projects? (5+5)

### Section-C

8. Briefly discuss the challenges in hill road construction. (5)
9. Can you explain what the difference between a roadway, a highway, and a freeway? Write the categories of roads as provisioned on Nepal Roads Standard 2070? Explain the use of tunnels and high bridges in highways in Nepal. (3+4+3)
10. Road condition in Nepal is poor to fair. What are the reasons behind it? How can we improve the condition of road? Please suggest the best practices of road maintenance in the world. (3+3+4)

### Section-D

11. What is the principle behind an activated-sludge treatment plant? Explain with a neat flow diagram. Also compare the conventional and step-aeration activated-sludge processes. (3+3+4)
12. What are the important uses of water? What is the per capita average demand for a Nepali Town for different uses? Explain the impurities in water and the purification mechanism of water at household level in Nepal. (2+4+4)

-The End-