

लोक सेवा आयोग
नेपाल नागरिक उड्डयन प्राधिकरण, प्राविधिक, सिभिल इन्जिनियरिङ्ग, पाँचौ, वरिष्ठ सहायक पदको
खुला प्रतियोगितात्मक लिखित परीक्षा
२०८०/१०/०४

पत्र : द्वितीय
समय : २ घण्टा ३० मिनेट

विषय : सेवा सम्बन्धी

पूर्णाङ्क : १००

प्रत्येक Section को उत्तर छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नुपर्नेछ । अन्यथा उत्तरपुस्तिका रद्द हुनेछ ।

Section "A"

50 Marks

1. Briefly describe the history of civil aviation in Nepal. List out international airports constructed and under planning consideration in Nepal. $3+2=5$
2. What is airport pavement? Compare the basic design concept for flexible and rigid airport pavements. $1+4=5$
3. What is airport drainage system? Write down its functions. What type of data will you collect for its design? $1+2+2=5$
4. What are the additional requirements for a Domestic Airport Terminal to be upgraded to an International Airport? Describe. 5
5. When do you use trigonometric levelling? What are its limitations? Describe. $3+2=5$
6. What is the purpose of Runway Threshold? How do you mark it and what are the standard dimensions of the markings?— $PJ-649$ $2+3=5$
7. What are the factors to be considered for the airport site selection? Why rose diagram is importance for runway orientation? Explain. $PJ-635$ $5+5=10$
8. What does ICAO stand for? Enlist the geometric design standards for the airport design as per ICAO. As per ICAO, write the class of Tribhuvan International Airport and elaborate it. 6.54 $PJ-625$ $5+5=10$

Section "B"

50 Marks

9. Mention the markings in the airport pavement. What do the letters 'L', 'R' and 'C' indicate in marking? $3+2=5$
10. Draw a Mass Haul Curve. What is free haul distance in Mass Haul Curve? What information do we get from it? $1+1+3=5$
11. Describe water cement ratio. Mention factors affecting strength of concrete. Why is curing done? $1+3+1=5$
12. What is a Tender Notice? How long is its period for National Competitive Bidding in Nepal? Mention the amount of bid security and performance bond in Nepal. $2+1+2=5$
13. Describe different types of foundations for civil engineering structures along with their suitability in soil types. 5
14. Describe the properties of cement to be used for airport construction. Also, mention the need for using admixtures. $4+1=5$
15. What do you mean by rate analysis and how is it prepared? What are the norms for M20 concrete? $5+5=10$
16. What are the responsibilities of civil overseer in Civil Aviation Authority of Nepal? Briefly explain the relation among employer, contractor and consultant in construction works. $5+5=10$

- The End -

लोक सेवा आयोग

नेपाल इञ्जिनियरिङ्ग सेवा, सिभिल समूह अन्तर्गत जनरल/हाइवे/स्यानिटरी/इरिगेशन/हाइड्रोपाव/हाइड्रोलोजी/एयरपोर्ट उपसमूह, राजपत्र अनङ्कित प्रथम श्रेणी (प्राविधिक) पदको प्रतियोगितात्मक लिखित परीक्षा

मिति:- २०८०।०५।१२

समय: २ घण्टा १५ मिनेट

पूर्णाङ्क:- १००

पत्र: द्वितीय

विषय: सेवा सम्बन्धित कार्य-ज्ञान

निम्न प्रश्नहरूको उत्तर Section अनुसार छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नुपर्नेछ।

Section – A

1. What do you mean by three point problem ? Explain several methods for solution of that problem. 5
2. Write down the various ingredients and the physical properties of the cement. 5
3. Draw shear force and bending moment diagram of a beam loaded with 4 kN/m uniformly distributed load having length 4 m. The support condition of beam is one end hinge and other end roller. 5
4. Briefly describe the discharge measurement method through notches. 5
5. What are the factors that affect compaction of soil? Illustrate the relation between compaction and optimum moisture content. 5
6. What is development length? What are the methods for achieving development length? 5
7. A sample of saturated soil has the water content of 25% and bulk unit weight of 20 kN/m³. Determine the dry unit weight, void ratio and specific gravity of solids. 4+3+3=10
8. Name the different forms of energy of flowing liquid. Explain the principle of conservation of energy and the relationship between Hydraulic Gradient Line (HGL) and Total Energy Line (TEL). 10

Section – B

9. What are the major causes of dampness? List the methods of damp proofing . 5
10. What are the functions of septic tank? Draw a schematic diagram of a septic tank showing its main components. 5
11. What are the major losses in irrigation canal ? Explain in brief. 5
12. List the various geometric elements to be considered in highway design. What are the factors on which the stopping sight distance depends ? 5
13. Prepare a specification for plastering work in exterior wall in cement sand mortar (1:4). 5
14. Shortly introduce the National Competitive Bidding (NCB) procedure for procurement of work practiced in Nepal. 5

Contd...

प्रदेश लोक सेवा आयोग

कोशी प्रदेश, विराटनगर

प्रदेश निजामती सेवा अन्तर्गत प्राविधिक तर्फ प्रदेश इन्जिनियरिङ सेवा, सिभिल समूह, जनरल/हाइवे/स्यानिटरी/इरिगेशन उपसमूह, सहायकस्तर पाँचौ तह, सब-इन्जिनियर/खा.पा.स.टे पदको द्वितीय चरणको खुला प्रतियोगितात्मक लिखित परीक्षा

मिति:- २०८१/०४/१९

समय: २ घण्टा ३० मिनेट

पत्र: द्वितीय
विषय: सेवा सम्बन्धी

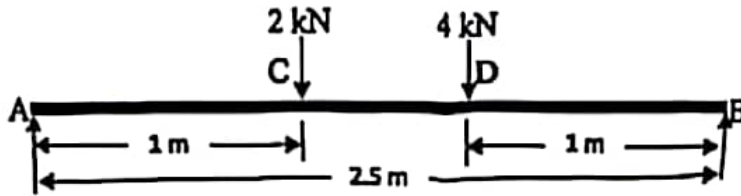
पूर्णाङ्क: १००

सबै प्रश्नहरू अनिवार्य छन्। प्रश्नहरूको उत्तर खण्ड (Section) अनुसार बोलाबोले उतपुस्तिकामा लेख्नुपर्नेछ अन्यथा उतपुस्तिका रद्द हुनेछ। परीक्षामा मोबाइल लगायत विद्युतीय उपकरणहरू प्रयोग गर्न पाइने छैन।

Section -A

Marks-45

1. भ्रष्टाचार निवारण ऐन, २०५९ का विशेषताहरू उल्लेख गर्नुहोस्। [5]
2. What are the major reasons for using admixtures? Write its classification by function. [2+3]
3. What do you mean by paint and varnish? Write down any six tests of bitumen. [1+1+3]
4. Calculate the shear force FA, FB, FC, FD in given diagram A. [5]



5. Define dynamic viscosity of a liquid. Explain four types of hydraulic coefficients. [1+4]
6. Write any five assumptions and two limitations of Terzaghi's general bearing capacity theory. [4+1]
7. Introduce and compare working stress and limit state philosophy for design of RCC structures. [5]
8. Define contouring. Explain any nine characteristics of contour maps. [1+9]

Section -B

Marks-55

9. What do you mean by shoring and is dewatering associated with it? [5]
10. Explain concrete mix, laying, pouring and compaction. [2+1+1+1]
11. Why the rate analysis and specification are crucial in estimation? [2.5+2.5]
12. State various types of contracts and explain its disadvantages. [2+3]
13. Define runway, taxiway and Apron of an airport. [5]
14. How would you use shallow and deep tube wells for the water supply in Terai? Under what conditions each is used and why? [5+5]
15. What do you understand by crop-water requirement? Explain various factors affecting crop-water requirement. [5+5]
16. Draw a cross section of a Highway of Nepal and define all the elements. [10]

<<The End>>

लोक सेवा आयोग
नेपाल विद्युत प्राधिकरण, प्राविधिक, सिभिल, सिभिल, पाँचौं, सुपरभाइजर पदको खुला प्रतियोगितात्मक
लिखित परीक्षा
२०८१/०३/०५

पत्र : द्वितीय
समय : २ घण्टा ३० मिनेट

पूर्णाङ्क : १००

विषय : सेवा सम्बन्धी विस्तृत ज्ञान

प्रत्येक Section को उत्तर छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नुपर्नेछ । अन्यथा उत्तरपुस्तिका रद्द हुनेछ ।

Section "A"

50 Marks

1. What are the factors that affect compaction of soil? Illustrate the relation between compaction and optimum moisture content. 5
2. Describe viscosity. Calculate the specific weight, specific mass, specific volume and specific gravity of a liquid having a volume of $5m^3$ and weight of 40KN. 1+4=5
3. Differentiate between pipe flow and open channel flow. 5
4. How surveying is important in design and construction of powerhouse and tunneling? 5
5. What is engineering drawing? Describe about the types of scale. 2+3=5
6. What is admixture? Mention different types of admixture with their application. 1+4=5
7. Calculate Shear Force and Bending Moment of simply supported beam of span (L) = 4 and carries uniformly distributed load (udl) = 5KN/m. Sketch shear force and B.M. diagram with calculated value. 10
8. Design a short column, square in section to carry an axial load of 200KN using mild steel and M20 mix. 10

Section "B"

50 Marks

9. Discuss the best practices involved in the installation of internal wiring system in residential buildings including appropriate wire sizing, routing and protection methods. 5
10. What is the purpose of transmission line? List out the types of transmission tower. 3+2=5
11. What safety measures should be followed while doing underground construction? 5
12. Explain the step by step procedures for preparation of cost estimate. 5
13. Describe specification. Mention the importance of specification in construction work. 2+3=5
14. What is water-cement ratio in construction work? Mention various factors affecting strength of concrete. 2+3=5
15. Describe Bar Chart, CPM and PERT techniques in planning and control of a construction work. Explain their uses with sketches. 10
16. Draw schematic diagram of typical hydropower system and explain its components. In your view what are the challenges in construction of hydropower project in Nepal? Describe. 2+4+4=10

- The End -

$w = mg$

लोक सेवा आयोग
नेपाल नागरिक उड्डयन प्राधिकरण, प्राविधिक, सिभिल इन्जिनियरिङ, सातौं, वरिष्ठ अधिकृत पदको
खुला प्रतियोगितात्मक लिखित परीक्षा
२०८१।०३।२५

पत्र : द्वितीय
समय : ३ घण्टा

पूर्णाङ्क : १००

विषय : सेवा सम्बन्धी

प्रत्येक Section को उत्तर छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नुपर्नेछ । अन्यथा उत्तरपुस्तिका रद्द हुनेछ ।

Section "A"

50 Marks

1. Point out different categories of visual aids for navigation at an airport. Explain taxiway marking with sketch. 2+3=5
2. Describe briefly about International Civil Aviation Organization (ICAO)'s requirement for aerodrome design and operations. 5
3. Explain different structural components of a flexible pavement. How does flexible pavement differ from rigid pavement? Explain. 5+5=10
4. What is the design consideration for airport terminal area? Explain. 10
5. What is Airport Master Planning? Elaborate the types of activities involved in the master plan process. 3+7=10
6. According to the Civil Aviation Authority Act, 2053, write functions, duties and power of Civil Aviation Authority of Nepal. 10

Section "B"

50 Marks

7. Briefly point out the special characteristics of airport drainage system. 5
8. List the sequence of layers and test requirements in the field to construct a flexible pavement of parallel taxiway. 2+3=5
9. What are the stability requirements for design of retaining walls? Explain with neat sketch. 10
10. What is contract? Explain general and specific conditions of contract while awarding contract for air traffic control building. 2+8=10
11. What are the different construction equipment and plants used in airport construction? Describe about different factors affecting selection of construction equipment. 3+7=10
12. Discuss the components and functions of Pavement Management System (PMS) in maintaining airport pavements. Write techniques for evaluating the structural strength of pavements. How do you assess runway surface conditions? Mention. 4+4+2=10

- The End -

प्रदेश लोक सेवा आयोग
वागमती प्रदेश
इन्जिनियरिङ सेवा, सिमित्त समूह, बिन्दिङ एण्ड आर्किटेक्ट उपसमूह, पाँचौ तह, सब इन्जिनियर पदको
खुला प्रतियोगितात्मक लिखित परीक्षा

पत्र: द्वितीय

विषय: सेवा सम्बन्धित कार्य-ज्ञान

परीक्षा मिति: २०८१/०२/२९

पूर्णाङ्क: १००

समय: २ घण्टा १५ मिनेट

निम्न प्रश्नहरूको उत्तर Section अनुसार छुट्टै छुट्टै उत्तरपुस्तिकामा लेख्न पर्नेछ, अन्यथा उत्तरपुस्तिका रद्द हुनेछ।

Section - A

[50 Marks]

1. What do you mean by Scale? Explain the types of Scale? [1+4]
2. Write the significance of working drawing of the construction project and when it is prepared? [5]
3. Differentiate between plinth area estimate and detailed estimate. [5]
4. Why specification is generally prepared in a building construction project? Explain its importance. [5]
5. Describe the safety precautions in electricity works. [5]
6. What are the methods of temporary adjustment of a level machine? [5]
7. What do you mean by scheduling of a civil engineering project? What are the advantages of scheduling? Discuss the classification of scheduling? [1+4+5]
8. Describe the method of plane tabling and what are the merits and demerits of plane table survey? [10]

Section - B

[50 Marks]

9. Define and sketch how bricks are laid in a Flemish bond. [5]
10. What type of shear reinforcements are used in a RCC beam? Explain with sketch. [5]
11. What are the basic requirements related to the shape and size of a building to make it earthquake resistant? [5]
12. Why climatology is important in a Building Design? [5]
13. Differentiate between interior and exterior modeling in Architecture? [5]
14. What are the difference between Civil Engineering and Architectural Engineering? Why Architectural Engineering is important in Building Construction? [5]
15. What do you mean by shallow foundation? Describe types of shallow foundation? Explain the causes of failure of foundations? [1+4+5]
16. Show a dog-legged timber staircase with help of plan and section with nominal dimensions and labeling of important elements. [10]

•समाप्त•

लोक सेवा आयोग
औद्योगिक क्षेत्र व्यवस्थापन लिमिटेड, प्राविधिक, इन्जिनियरिङ्ग, सिभिल, पॉची, सब-इन्जिनियर/एस.
पदको खुला प्रतियोगितात्मक लिखित परीक्षा
२०८१/०२/२३

पत्र : द्वितीय
समय : २ घण्टा ३० मिनेट

पूर्णाङ्क : १००

विषय : सेवा सम्बन्धी

प्रत्येक Section को उत्तर पुढापुढै उत्तरपुस्तिकामा लेख्नुपर्नेछ । अन्यथा उत्तरपुस्तिका रद्द हुनेछ ।

Section "A"

45 Marks

1. What is engineering drawing? Differentiate between artistic drawing and engineering drawing. 2+3=5
2. What kind of tests do you suggest for bricks while using in construction? Explain. 5
3. Discuss the relationship between shear force and bending moment. 5
4. What are the modes of failure in under reinforced and over reinforced beam? Explain. 5
5. What is rate analysis? Write its importance. 2+3=5
6. Why foundation is provided in structure? Explain the types of shallow and deep foundations. 2+8=10
7. A short axially loaded square column 500mm x 500mm is subjected to service load of 2000KN. Calculate the ultimate load and minimum area of longitudinal reinforcement. 10

Section "B"

55 Marks

8. Write the contractual procedure of sealed quotation based on the prevailing act and regulation of Nepal. 5
9. What are the applications of total station in surveying? Describe with examples. 5
10. What are cross drainage structures? Explain its types with neat sketches. 2+3=5
11. Define potable and wholesome water. Also, discuss about significance of WHO guidelines for drinking water quality. 2+3=5
12. What are the advantages and disadvantages of onsite sanitation? Write. 5
13. Mention the important characteristics of contour. Write use of contour map. 5+5=10
14. Describe the types of pavement. What are the components of pavement of road structure? Explain. 5+5=10
15. What is sewerage system? Discuss its types with advantage and disadvantage. 10

प्रदेश लोक सेवा आयोग
बागमती प्रदेश
इन्जिनियरिङ सेवा, सिभिल समूह, पाँचौं तह, सब इन्जिनियर पदको
खुला प्रतियोगितात्मक लिखित परीक्षा
परीक्षा मिति: २०८१/०२/१९

पत्र: द्वितीय

विषय: सेवा सम्बन्धित कार्य-ज्ञान

पूर्णाङ्क: १००

समय: २ घण्टा १५ मिनेट

निम्न प्रश्नहरूको उत्तर **Section** अनुसार छुट्टै छुट्टै उत्तरपुस्तिकामा लेख्न पर्नेछ, अन्यथा उत्तरपुस्तिका रद्द हुनेछ।

Section - A

[50 Marks]

1. Write in brief about general classification of surveys. [5]
2. What do you mean by paint and varnishes? What is the purpose of using it? [3+2]
3. Describe shortly classification of different bricks. [5]
4. Differentiate between Shear Force and Bending Moment. Calculate the maximum bending moment of simply supported beam of span (l) having uniformly distributed load (w) per unit length. [3+2]
5. Define levelling. Explain the temporary adjustment of levelling. [5]
6. Differentiate between one-way slab and two-way slab. What are the design procedure for slab? [2+3]
7. What happens if soil is not compacted? How does compaction affect engineering properties of soils? [5+5]
8. What is the different between pipe flow and open channel flow, discuss in detail with example? [10]

Section - B

[50 Marks]

9. Differentiate between shallow foundation and deep foundation. [5]
10. Write short note on Duty, Delta, Base period in Irrigation System. [5]
11. How do you provide longitudinal and cross drainages in hill roads? Explain. [5]
12. Why estimate should be prepared? What are the purposes of rate analysis and which points are taken into consideration while preparing analysis of rate? [2+3]
13. What is the role of civil sub-engineer in establishing good relation among owner, consultant and contractor? [5]
14. Explain the importance of supervision in construction projects. [5]
15. Write different components of gravity water supply system. What are major factors which needs to be considered during design of this system. [10]
16. What are the design and construction problems of hill road? What are the special consideration which need to be followed in the selection of alignments for road in mountainous area? [10]

•समाप्त•

लोक सेवा आयोग

नेपाल इन्जिनियरिङ्ग सेवा, सिभिल ग्राह, हाइवे उपसमूह,
राजपत्र अनङ्कित प्रथम श्रेणी, ल्याब टेक्निसियन (प्राविभिन) पदको प्रतियोगितात्मक लिखित परीक्षा
मिति २०८१/२०९५

समय: २ घण्टा १५ मिनेट

पूर्णाङ्क १००

पत्र: द्वितीय

विषय: सेवा सम्बन्धित कार्य-ज्ञान

विभिन्न प्रश्नहरूको उत्तर Section अनुसार छुट्टाछुट्टै उपलब्धिकासा स्रोतहरूबाट लिनुपर्नेछ।

Section - A

50 Marks

1. Mention the physical requirement of aggregate for surface dressing chips referring to relevant standard specifications for roads and bridges of Department of Roads. 5
2. Explain how the values of radius of horizontal curve, superelevation and maximum gradient vary with the changes in design speed referring to the relevant Nepal Road Standard of Department of Roads. 5
3. What are the basic requirement of a road alignment? Explain the types of road based on functional classification. 5
4. What is the purpose of technical specifications in a construction project? State. 5
5. Briefly illustrate the responsibilities of a Lab Technician working on behalf of clients. 5
6. What do you mean by OMC? Describe the factors that effect the soil compaction. 5
7. What are the factors to control the geometric design of a highway? Calculate the rate of superelevation for a national highway whose design speed is 120 km/hr, assuming necessary data. 5-5=10
8. Describe in detail the construction procedure of surface dressing road. How is quality control of work carried out? Mention. 6-4=10

Section - B

50 Marks

9. How is the compression test of concrete carried out? Elaborate. 5
10. Explain in brief the laboratory testing procedure of softening point test of bitumen. Also, mention the significance of this test. 5
11. Describe the procedure for field density test by sand replacement method. 5
12. How is proctor compaction test carried out in road work? Explain in brief. 5
13. What is sampling of material? How is sampling carried out of aggregates? Elucidate. 5
14. Describe the sampling techniques of construction material. How does the sample represent the same work? State. 5
15. What is VG bitumen? Explain briefly the main tests to be carried out to check the suitability of bitumen for road construction. Which VG grade bitumen is suitable for construction of bitumen road in mountainous region of Nepal? Discuss. 10
16. What are the differences between quality control and quality assurance plan? How can quality management plan and quality control system enhance the output of a project? Describe. 6+4=10

«The Ends»

(२)

प्रदेश इन्जिनियरिङ, सिभिल, विल्डिङ्ग एण्ड आर्किटेक्ट, पाँचौ, सब-इन्जिनियर, द्वितीय पत्र

14. Why should municipality consider the parameters for constructing a building on the housing lot through enforcement of Building Byelaws: [1 x 5]
- Greenery
 - Ground coverage
 - Right of way
 - Floor area ratio
 - Setbacks i.e. margins
15. Describe in detail about the earthquake resistant features in [5+5]
- RCC Frame Structure Building
 - Load Bearing Structure Building Construction as per Nepal National Building Code
16. Water leakage/dampness is found as a common problem in most of the public buildings. Find out its causes and provide its remedy using different damp proofing materials and techniques in vertical and horizontal building components. [5+5]

<<The End>>

प्रदेश लोक सेवा आयोग

कोशी प्रदेश, विराटनगर

प्रदेश निनामती सेवा अन्तर्गत प्राविधिक तर्फ प्रदेश इन्जिनियरिङ सेवा, सिभिल समूह, विल्डिङ एण्ड आर्किटेक्ट उपसमूह, सहायकस्तर पाँचौ तह, सत्र-इन्जिनियर पदको खुला प्रतियोगितात्मक लिखित परीक्षा

मिति:- २०८१/०२/०५

समय: २ घण्टा १५

पत्र: द्वितीय

पूर्णाङ्क: १००

विषय: सेवा सम्बन्धित कार्य ज्ञान

सबै प्रश्नहरू अनिवार्य छन्। प्रश्नहरूको उत्तर खण्ड (Section) अनुसार बेन्तावेले उत्तरपुस्तिकामा लेख्नुपर्नेछ अन्यथा उत्तरपुस्तिका रद्द हुनेछ। परीक्षामा मोबाइल लगायत विद्युतीय उपकरणहरू प्रयोग गर्न पाइने छैन।

Section -A ✓

Marks-50

1. Explain the different types of sewerage disposal system used in Nepal. [5]
2. Explain the responsibilities of a building sub-engineer. [5]
3. What do you mean by the rate analysis of an item of work? What are the breakdown of an item work for rate analysis practiced in Nepal? [2+3]
4. What are the factors to be considered while designing septic tank and soak pit? [5]
5. Describe the differences between fine aggregates and course aggregates. Explain the importance of maintaining their proportion in the cement concrete work. How should we store cement? What are the roles of admixture while cement concreting? [2+1+1+1]
6. What is the difference among level, theodolite and a total station? [5]
7. What is the purpose of estimating and costing? Describe differences between estimates: preliminary, approximate quantity and detailed. What are the main parts of a residential building structure with descriptions of each parts? [1+2+7]
8. Provide samples in tabular form to maintain daily records of labor, construction materials, equipment, and the measurement book, including weather inclement conditions for the work contract and what roles do they play in consideration of an extension of time, variations of work, and claims by the contractor? [6+4]

Section -B ✓

Marks-50

9. Explain with sketches the under reinforced, over reinforced and balanced section. [5]
10. What do you understand by workability of concrete and how it is maintained in building construction? [5]
11. What do you understand by orientation of building? [5]
12. What is the importance of the topographical map with contours in preparing the master plan of a building? Prepare a schematic layout for a rectangular-shaped building plan using a holistic approach, positioning it two meters inside the rectangular layout lines. [3+2]
13. Clay tiles or slates used for roofing materials in residential houses in the past have been found vulnerable to earthquake. What materials do you suggest to replace them? [5]

क्रमशः

लोक सेवा आयोग

नेपाल इञ्जिनियरिङ्ग सेवा, सिभिल समूह, जनरल, हाइवे उपसमूह,
राजपत्र अनङ्कित प्रथम श्रेणी (प्राविधिक) पदको प्रतियोगितात्मक लिखित परीक्षा
मिति: २०८१/२/५

समय: २ घण्टा १५ मिनेट

पूर्णाङ्क: १००

पत्र: द्वितीय

विषय: सेवा सम्बन्धित कार्य-ज्ञान

निम्न प्रश्नहरूको उत्तर Section अनुसार छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नुपर्नेछ।

Section - A

50 Marks

1. What is reciprocal levelling? When and how do we conduct reciprocal levelling? State. 5
2. Explain different types of cements used in Nepal and its suitability. Which cement is used for mass concrete work and why? Write down. 5
3. Write short notes on Poisson's ratio and Hook's law. 2.5+2.5=5
4. Differentiate between weirs and notches. 5
5. Explain the following terms. 2+2+1=5
 - a) Under reinforced section
 - b) Over reinforced section
 - c) Balanced section
6. What is Optimum Moisture Content (OMC) and maximum dry density? Show the relation between dry density and moisture content. 5
7. Describe three phase system of soil with diagram. Define void ratio and porosity. The soil sample contains volume of void 0.2 and volume of soil is 0.30. Calculate the void ratio and porosity of soil. 4+2+4=10
8. Prove the bending equation for a homogeneous section $\frac{C}{y} = \frac{M}{I} = \frac{E}{R}$ with usual notations. 10

Section - B

50 Marks

9. Why superelevation is provided over a curve of the road? Give the formula for it. 5
10. What are the importance of CPM and PERT in the construction practice? Write down. 5
11. Mention the different design aspects to be considered in the design of horizontal alignment of a road. 5
12. Describe rate analysis with suitable example. ^{or for} quantity of various item of work. 5
13. Describe with the help of figure damp proof treatment in the basement of a building in damp soils. 5
14. Discuss the various types of losses that occur in irrigation canals and their impact on water efficiency. 5
15. Explaining the need of extra-widening width, find the total pavement width required for a four lane highway on a horizontal radius of 250 m. The design speed is 60 km/hr and length of the longest wheelbase is 6.1 m. 3+7=10
16. What is curing of concrete and why is it necessary? List out the different methods of curing. 1+2+7=10

«The End»

प्रदेश लोक सेवा आयोग

गण्डकी प्रदेश

प्रदेश/स्थानीय इन्जिनियरिङ सेवा, सिभिल समूह, जनरल/स्यानिटरी/इरिगेशन उपसमूह, पाँचौ तह, सब-इन्जिनियर पदको खुला तथा समावेशी प्रतियोगितात्मक लिखित परीक्षा

परीक्षा मिति: २०८१।०१।०३

समय: २ घण्टा १५ मिनेट

पत्र: द्वितीय

पूर्णाङ्क: १००

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

Section-A

1. Mention the basic principles of surveying and elaborate the statements. (1+4=5)
2. Mention the major properties and functions of cement. What are the major things to be taken care while storing the cement? (2.5+2.5=5)
3. Draw the bending moment and shear force diagrams for a simply supported beam of length, L , carrying a uniformly distributed loading of ' w ' KN/m throughout the span. (2.5+2.5=5)
4. Define Notch and Weir. What are the advantages of a triangular notch over a rectangular notch? (2+3=5)
5. Explain the Darcy's law. (5)
6. A rectangular beam is 200 mm wide 400 mm deep up to the center of reinforcement. Find the reinforcement required if it has to resist a moment of 40 KNm. Assume M20 mix and Fe 415 grade steel. (5)
7. List down the responsibilities of a civil sub-engineer in any construction project. Discuss how accidents take place relating to working environment at construction site. Suggest remedial measures to avoid and prevent accidents in construction site in context of Nepal. (4+3+3=10)
8. Define the terms 'Bearing capacity, Factor of safety and Ultimate Bearing capacity.' How can the BC of soil be improved? Explain. (1+1+1+7=10)

Section-B

9. What are the points to be considered for the suitability of the foundation in the construction work? Draw the different types of shallow foundation? (5)
10. Discuss briefly on various sources of water supply. (5)
11. What is septic tank? Discuss the design and construction features of a septic tank. (1+4=5)
12. Explain three most suitable method of river training works in hilly regions of Gandaki Provinces with Sketches. (5)
13. Describe about the various physical tests of cement. (5)
14. Write down the responsibilities of a Civil Sub-Engineer in the supervision of Construction Works. (5)
15. Explain the classification of roads as per Nepal Road Standard, 2070. Describe the special consideration for alignment of Hill Roads. (5+5=10)
16. Make a Bar Chart for scheduling the construction of a 2 Km sewer line in Pokhara. Assume that the sewer line runs below a major urban road in Pokhara. Also list down major three practical challenges faced during execution of such project and identify the appropriate solution to tackle those challenges. Assume necessary data appropriately. (5+5=10)

-The End-

लोक सेवा आयोग
नेपाल पदवी, प्राविधिक, इन्जिनियरिङ, आवास तथा भौतिक इन्जिनियरिङ, प्राविधिक प्रहरी नायब
निरीक्षक (रयानिदरी/सिगिल) पदको खुला प्रतियोगितात्मक लिखित परीक्षा
२०८०/१२/१२

पत्र द्वितीय
समय २ घण्टा ३० मिनेट

पृष्ठ १००

विषय : Professional and Service Specific Test

प्रत्येक Section को सारा पङ्क्ति उत्तरित गर्न सकिनेछ । प्रश्नमा आवश्यकताको रद हुनेछ ।

Section : "A"

45 Marks

1. Explain the properties and uses of different cements in the context of Nepal's construction industries. 5
2. Draw and label the bending moment diagram of a simply supported beam with uniformly distributed load. 5
3. Define notches and weirs. Write the formula that gives discharge over a rectangular weir. 3+2=5
4. Explain the classification of surveying based on instruments. Write down the principles of surveying. 8+2=10
5. Define bearing capacity. Enlist the factors affecting bearing capacity. Explain with illustration different types of shallow foundations. 1+3+6=10
6. Define hydraulic jump. What are the applications of hydraulic jump? Describe syphon and draw the sketch of syphon pipe connecting two reservoirs. 2+4+4=10

Section : "B"

45 Marks

7. Enlist the basic data requirement for detailed estimation of water supply projects. What factors need to be viewed during the preparation of detailed estimate? 2+3=5
8. Explain in brief the different methods of valuation of typical building in Kathmandu. 5
9. Why is curing of concrete important? Mention the methods of curing. 2.5+2.5=5
10. Explain the design procedure of septic tank with neat sketches. Assume necessary parameters by yourself. 7+3=10
11. Describe per capita and the types of water demand. Why does the variation in water demand occur? Explain. 2+4+4=10
12. Explain about the components of flexible pavement. Describe construction procedure of asphalt road. 3+7=10

Section : "C"

10 Marks

13. नेपालको संविधानले शोषण विरुद्ध के-कस्ता हकको व्यवस्था गरेको छ? लेख्नुहोस् । 4
14. संयुक्त राष्ट्रसंघ स्थापनाको उद्देश्य र यसका सिद्धान्तहरू बुँदागत रूपमा उल्लेख गर्नुहोस् । २+३=५

- The End -

नेपाल इन्जिनियरिंग सेवा मिथिल क्वड अन्तर्गत बनारस हाइवे/स्मार्टिटी इन्जिनियरिंग/हाइड्रोलेजी/एलपोर्ट उन्वन्त. एन्वन्त अन्वन्त एन्वन्त सेवी (एन्वन्त), इन्वन्त एन्वन्त

15. What is Manning's rugosity coefficient ? For an earthen rectangular canal, calculate the discharge if width of the canal is 2 m and depth of flow is 1.5 m . Assume Manning's rugosity coefficient as 0.025 and longitudinal slope of canal is 1 in 4000. 2+8=10
16. Calculate the safe stopping distance for design speed 60 km per hour for a two-way traffic on a two-lane road assuming coefficient of friction is 0.37 and reaction time of driver as 2.5 seconds. 10

««« The End »»»

लोक सेवा आयोग
नेपाल इञ्जिनियरिङ्ग सेवा, सिभिल समूह अन्तर्गत जनरल/हाइवे/स्यानिटरी/इरिगेशन/हाइड्रोपावर/हाइड्रोलोजी/
एयरपोर्ट उपसमूह, राजपत्र अनङ्कित प्रथम श्रेणी (प्राविधिक) पदको प्रतियोगितात्मक लिखित परीक्षा

मिति:- २०८०।०५।१२

पूर्णाङ्क:- १००

समय: २ घण्टा १५ मिनेट

पत्र: द्वितीय

विषय: सेवा सम्बन्धित कार्य-ज्ञान

निम्न प्रश्नहरूको उत्तर Section अनुसार छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नुपर्नेछ।

Section - A

1. What do you mean by three point problem ? Explain several methods for solution of that problem. 5
2. Write down the various ingredients and the physical properties of the cement. 5
3. Draw shear force and bending moment diagram of a beam loaded with 4 kN/m uniformly distributed load having length 4 m. The support condition of beam is one end hinge and other end roller. 5
4. Briefly describe the discharge measurement method through notches. 5
5. What are the factors that affect compaction of soil? Illustrate the relation between compaction and optimum moisture content. 5
6. What is development length? What are the methods for achieving development length? 5
7. A sample of saturated soil has the water content of 25% and bulk unit weight of 20 kN/m³. Determine the dry unit weight, void ratio and specific gravity of solids. 4+3+3=10
8. Name the different forms of energy of flowing liquid. Explain the principle of conservation of energy and the relationship between Hydraulic Gradient Line (HGL) and Total Energy Line (TEL). 10

Section - B

9. What are the major causes of dampness? List the methods of damp proofing. 5
10. What are the functions of septic tank? Draw a schematic diagram of a septic tank showing its main components. 5
11. What are the major losses in irrigation canal ? Explain in brief. 5
12. List the various geometric elements to be considered in highway design. What are the factors on which the stopping sight distance depends ?
13. Prepare a specification for plastering work in exterior wall in cement sand mortar (1:4).
14. Shortly introduce the National Competitive Bidding (NCB) procedure for procurement of work practiced in Nepal.

प्रदेश लोक सेवा आयोग

आगमनी प्रदेश

इन्जिनियरिङ सेवा, सिभिल समूह, पाँचौं तह, सब इन्जिनियर पदको

सुत्ता प्रतियोगितात्मक निश्चित परीक्षा-२०७९

परीक्षा मिति: २०७९/१२/०४

पत्र: द्वितीय

पूर्णाङ्क: १००

विषय: सेवा सम्बन्धित कार्य-ज्ञान

समय: २ घण्टा १५ मिनेट

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

Section - A

[50 Marks]

1. Describe under reinforced, over reinforced and balanced RCC section. [5]
2. Write down the various equipment used in field compaction of soil. [5]
3. Differentiate between weir and notch. Explain their uses. [3+2]
4. Define shear force and Bending Moment. discuss its relationship. [5]
5. What are the different types of cement? Write down the ingredients of Portland Cement. [2+3]
6. What are the qualities of good bricks? Why we should be careful about the harmful ingredients in brick earth? [2+3]
7. Explain the principles of levelling. Describe reciprocal levelling with sketch. [10]
8. Calculate shear force and Bending Moment of simply supported beam of span (l)=4 m and carries uniformly distributed load (udl)=5 KN/m. Sketch shear force and B.M. diagram with calculated value. [10]

Section - B

[50 Marks]

9. Describe about various types of foundation of structure. [5]
10. The catchment area of the city is 200 hectors and its population density is 300/hector. The water supply cooperation supplied at the rate of 135 lpcd in the city. Calculate the quantity of sewage generation if the 85% of the water supplied is being collected as wastewater at the treatment plant. Assume the peak factor for water supply is 2. [5]
11. Write down the advantage and disadvantages of irrigation. [5]
12. Define highway drainage and explain the importance of highway drainage. [2+3]
13. Describe about different types of estimates of civil works. [5]
14. Define Bar Chart with figure and explain its advantages and disadvantages. [5]
15. Describe different types of wall system and their function and advantages in building construction. [10]
16. What are the basic design controls and design criteria for roads in Nepal? Also draw a neat sketch of typical cross section of road with pavement structures. [7+3]

•समाप्त•

प्रदेश लोक सेवा आयोग
वागमती प्रदेश

इन्जिनियरिङ सेवा, सिभिल समूह, जनरल उपसमूह, पाँचौं तह, ल्याब टेक्निसियन पदको
खुला प्रतियोगितात्मक लिखित परीक्षा-२०७९
परीक्षा मिति: २०७९/१२/१४

पत्र: द्वितीय

विषय: सेवा सम्बन्धित कार्य-ज्ञान

पूर्णाङ्क: १००

समय: २ घण्टा १५ मिनेट

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

Section - A

[50 Marks]

1. How do you prepare specification of cement concrete road? write the example of specification of it. [5]
2. Define construction management. What is the main objective of construction management? [2+3]
3. Write short notes on soil compaction techniques. [5]
4. Write down classification of Road in Nepal according to NRS 2027. [5]
5. Describe longitudinal gradient in a road alignment on the basis of Nepal Road Standards. [5]
6. Elaborate on Gabion wires and their applications? [5]
7. What are the special considerations to be taken while constructing hill road? Explain in detail. [10]
8. How do you construct WBM roads? What is its suitability? Discuss in detail. [10]

Section - B

[50 Marks]

9. What is Plasticity Index and how do you determine its value in earth work. [5]
10. Define Maximum Dry Density (MDD) and Optimum Moisture Content (OMC) [5]
11. What are different test needed for aggregates? Discuss. [5]
12. Write down importance of Flakiness Index of aggregates in Road Pavement Construction. [5]
13. Describe about laboratory testing procedure and equipment for Aggregate Impact Value (AIV). [5]
14. Write down any four laboratory tests for Gabion wire. [5]
15. Describe concrete mix design with example. [10]
16. Write a proposal for a laboratory establishment in your office premises with all facilities to test for road construction testing. [10]

•समाप्त•

लोक सेवा आयोग

नेपाल इन्जिनियरिङ्ग सेवा, सिगिल समूह अर्न्तगतका जनरल, हाईवे, स्यानीटरी, इरिगेशन, हाइड्रोलोजी समूह, राजपत्र अनङ्कित प्रथम श्रेणी, (प्राविधिक) पदको प्रतियोगितात्मक लिखित परीक्षा
मिति: २०७९/११/३०

समय: २ घण्टा १५ मिनेट

पूर्णाङ्क : १००

पत्र:- द्वितीय

विषय:- सेवा सम्बन्धित कार्य-ज्ञान

निम्न प्रश्नहरूको उत्तर Section अनुसार छुट्टाछुट्टै उत्तरपुस्तिकागमा लेख्नुपर्नेछ ।

Section - A

50 Marks

1. What is contouring? What factors affect the contour interval? State. 5
2. Mention the different types of cement used in construction industry and highlight their specific use during construction. 5
3. Draw the shear force (SF) and bending moment (BM) diagrams for a simply supported beam of length 'l' carrying a uniformly distributed load 'w' per unit length which occurs across the whole beam. 5
4. Introduce pressure energy, kinetic energy and potential energy in pipe flow. 5
5. Define ultimate bearing capacity of soil. How do you calculate safe bearing capacity from ultimate bearing capacity? What is allowable bearing pressure? Mention. 5
6. Write down different types of shear reinforcement in a RCC section and briefly explain the steps of shear reinforcement design. 5
7. Explain the different types of correction in chain survey. Find the sag correction of 30m steel tape under a pull of 8kg in three equal spans of 10m each.
weight of 1 cum of steel = 7.86 g
Area of cross section of tape = 0.10 sqm 5+5=10
8. Explain in brief the design considerations in two-way slabs according to IS code. Also, introduce under reinforced and over reinforced sections with their suitability. 5+5=10

Section - B

50 Marks

9. What are the main factors affecting strength of concrete? What is curing of concrete and its importance? Write down. 5
10. Explain the different factors to be considered during selection of water source to provide drinking water facility to municipal population. Again, state the methods of determining storage tank capacity as well. 5
11. "Irrigation is a necessity for agricultural production, but sometimes irrigation may create adverse situations for crops, environment and living things." Justify this statement. 5
12. According to the Nepal Road Standard, what are the classifications of road in Nepal? Describe. 5
13. According to prevailing Financial Act and Regulation of Government of Nepal, list out the procedural steps for preparing rate analysis and the cost estimation for civil works. 5
14. Explain about the historic developments of airports in Nepal. 5
15. Design an Irrigation canal section to irrigate 12750 ha of agricultural land with a duty of 850 ha/m³/sec. Assume the canal to be in non-erodible material for a maximum permissible velocity of 0.8 m/s with longitudinal slope of 1 in 4000, side slope of 1:1 and Manning's "n" being equal to 0.025. 10
16. What are the basic requirements of road alignment? What do you mean by superelevation? How is it different from camber? Write down the significance of superelevation. 10

«««The End»»»

वागमती प्रदेश
इन्जिनियरिङ सेवा, सिभिल समूह, सातौं तह, इन्जिनियर पदको
अन्तर तह तथा खुला प्रतियोगितात्मक लिखित परीक्षा
परीक्षा मिति: २०८१/१०/०५

पत्र: द्वितीय
विषय: सेवा सम्बन्धी

पूर्णाङ्क: १००
समय: ३ घण्टा

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

Section - A

[30 Marks]

1. What are the steps of a RCC singly reinforced beam design using limit state method? [5]
2. What is soil compaction? How is it different from consolidation? What are the factors that affect compaction? [1+2+2]
3. What do you mean by structural irregularity in designing earthquake resistant building? Briefly illustrate the different aspects of vertical irregularity and mass irregularity. What is the importance of ductile detailing for earthquake resistant building construction? [1+4+5]
4. What is the purpose of site investigation? What are different in-situ test used in site investigation? How bearing capacity is calculated using N-Value for isolated footing, mat, pile and well? [2+4+4]

Section - B

[25 Marks]

5. Explain in brief Bernoulli's equation and its application. [3+2]
6. Define Duty, Delta and Base period of a crop. Derive the relation between them. [4+6]
7. In hydropower structures, what is the purpose of de-sanding basin? Explain its types and factors to be considered in its design. [3+3+4]

Section - C

[25 Marks]

8. Illustrate hair pin bend in hill roads with neat sketch. [5]
9. What is highway drainage? Briefly describe the subsurface drainage for lowering of water table, control of seepage flow and control of capillary rise with typical sketches. [1+3+3+3]
10. Explain in brief the various impacts of airport in the vicinity area regarding aircraft noise, air quality and water and soil pollution. How these things are considered in airport planning? [6+4]

Section - D

[20 Marks]

11. What is activated sludge processes in sewage treatment? Why BOD removal/treatment for domestic waste is important before discharging in natural rivers. [5+5]
12. Explain the need of EIA, IEE and BES in road and bridge projects. What is the provision of preparation and approval of EIA in government rules and regulations? [4+6]

• समाप्त •