

लोक सेवा आयोग
नेपाल इन्जिनियरिंग सेवा, सिभिल समूह अन्तर्गत हाइवे, स्यानिटरी र हाइड्रोपावर उपसमूह,
राजपत्रांकित तृतीय श्रेणी (प्राविधिक) पदको प्रतियोगितात्मक लिखित परीक्षा
मिति: २०८१/१०/१२

समय: ३ घण्टा

पूर्णाङ्क: १००

पत्र: द्वितीय

विषय: Technical Subject

तलका प्रश्नहरूको उत्तर Section अनुसार छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नुपर्नेछ।

Section - A

30 Marks

1. For a soil sample with maximum dry density 1.86 t m^{-3} at 15% water content and of specific gravity 2.7, calculate degree of saturation, air content and percentage of voids at the maximum dry density. Assume any relevant data if you need. 5
2. Describe in brief the advantages and limitations of pre-stressed concrete. 5
3. Using suitable formula and diagrams, carry out the stability analysis of an earth retaining wall. 10
4. Explain the different considerations for structural design of bridges focussing on live load, impact load, wind load and centrifugal force. In addition, provide the design principles for solid slab bridges. 5+5=10

Section - B

25 Marks

5. How can one estimate depth and frequency of irrigation for an irrigation command area for irrigation scheduling? Write down. 5
6. What are the advantages of concrete gravity dams? Show the different forces acting on gravity dams with a neat sketch. How do you analyze the stability of concrete gravity dams against sliding and overturning? Elaborate. 2+3+5=10
7. The mean monthly flow of a typical Nepalese River is given below. The headwater level is 1,200 m, whereas Tailwater level is 800 m and can be considered as constant. Assuming a design discharge as $50 \text{ m}^3/\text{s}$, total head loss as 3%, overall efficiency of the plant as 90%, compute firm and secondary energy produced by the plant. What is the contribution of dry energy (Dec-May) to the total generation? Assume any relevant data you need. 10

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
11	10	13	20	31	63	134	164	111	56	31	17	55

Section - C

25 Marks

8. Introduce International Civil Aviation Organization (ICAO) and briefly describe its roles. 2+3=5
9. Explain the importance of highway drainage systems and state the different types of drainage in hill roads. 4+6=10
10. Give an introduction of 'Flexible' and 'Rigid' pavements with their suitability. How do you calculate different loads on highway pavement? Explain the construction method of concrete pavement. 3+3+4=10

Contd...

Section – D

20 Marks

11. Differentiate clearly between slow and rapid sand filter. Also, explain cleaning and maintenance of slow sand filter. 6+4=10
12. Why is environmental study necessary before executing an infrastructure development project? Mention the process of EIA study and its approval. 3+7=10

«««The End»»»

लोक सेवा आयोग
नेपाल इन्जिनियरिङ्ग सेवा, सिभिल समूह, बिल्डिङ्ग एण्ड आर्किटेक्ट उपसमूह,
राजपत्राङ्कित तृतीय श्रेणी (प्राविधिक) पदको प्रतियोगितात्मक लिखित परीक्षा
मिति: २०८१/१०/२९

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विषय: Technical Subject

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Section – A

30 Marks

- 1) Why is stone considered as a prime building material? Explain with examples. 5
- 2) What do you understand by low cost construction technique? State. 5
- 3) What is underpinning? Where are they used in building construction? Sketch it and level its components. 10
- 4) Discuss the types and implementation status of Nepal National Building Code, 2060. How can we implement this code at municipalities? Describe. 5+5=10

Section – B

20 Marks

- 5) Describe in detail step by step procedures for axially loaded steel column using built up section with Fe 350 grade of steel. 10
- 6) What are the common types of footings in buildings? Describe advantages and limitations of different types of footings. 10

Section – C

30 Marks

- 7) Differentiate between Squatters and Slums. 5
- 8) What do you understand by periodic plan? Why is it necessary for municipalities? Write. 5
- 9) How can Town Development Committees be activated in Urban Development and Planning? Illustrate with the roles of municipalities in Federal context. 10
- 10) Name the World Cultural Heritage sites are in Nepal. What are economic advantages of preserving the heritages? Explain. 2+8=10

Section – D

20 Marks

- 11) Apart from the resilience and functionality, building should ensure their comfort, safety and efficiency. Explain clearly key categories of building services essential for creating habitable and operational spaces in buildings. 10
- 12) Describe the scenario of the Nepalese Architecture in Lichchhavi and Malla period. 10

«« The End »»

लोक सेवा आयोग

नेपाल इन्जिनियरिङ्ग सेवा, सिभिल समूह, जनरल/हाइवे/स्यानिटरी/इरिगेशन/हाइड्रोपावर उपसमूह
राजपत्राङ्कित तृतीय श्रेणी (प्राविधिक) पदको प्रतियोगितात्मक लिखित परीक्षा

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Section – A

30 Marks

- 1) Define the permeability of soil and explain with neat sketches and formula. Elucidate the methods of determining the coefficient of permeability. 5
- 2) What are the three strengths of a riveted lap joint system of steel? How is the design strength of the joint determined? Explain with neat sketches and formula. 5
- 3) Mention the major principles and steps to be followed in the design of T-beam bridge using carbon's method. 10
- 4) A site investigation has to be done for a 6-lane bridge to be constructed in Karnali river. The client seeks the information on bearing capacity and settlement of foundation for the bridge. What method of site investigation and in-situ tests would you advise as a project engineer? Explain the in-situ test you advised in detail. 10

Section – B

25 Marks

- 5) Explain the concept of Bernoulli's equation. Show each component of Bernoulli's equation in case of a uniform diameter of pipe flow. Also, draw the HGL and TEL for this case. 5
- 6) Describe the significance of hydrological analysis for a hydropower project. What are the different parameters of hydrological analysis? How do you estimate and use these parameters in the project? State. 3+3+4=10
- 7) Design concrete-lined irrigation canal to carry a discharge of 45 cumes. The bed slope of canal is 1:3000. Take side slope 2:1 and Manning's coefficient $n = 0.015$. Assume any data you need. 10

Section – C

25 Marks

- 8) Write down about California Bearing Ratio (CBR) test. How is a pavement designed with CBR value? State. 2+3=5
- 9) State traffic control devices that are used on roads with their functions. What are the factors that should be considered while designing a road intersection? Elaborate. 4+6=10
- 10) Explain the factors that influence the selection of an airport location. How these factors impact the safety management systems and aerodrome certification process? Describe. 5+5=10

contd.....

Section – D

20 Marks

11) What are the factors affecting the self purification of natural streams? Explain. Discuss on the concept of oxygen Sag Curve in reference to self purification of natural streams. 10

12) Answer the following. 2×5=10

a) Estimate the stormwater volume generated during the heaviest rainfall in Godawari Municipality, Lalitpur using the Rational Method. The following information is given.

Population: 100,000, Rainfall: 240 mm in 24 hours, Area of the municipality: 70 square kilometers, Land cover: One fourth of the municipality is built-up, and the rest is covered by agriculture and forest. The formula is: $Q = CIA/360$ where; Q = Peak discharge (stormwater runoff) in cubic meters per second, C = Runoff coefficient, I = Rainfall intensity in mm/hour, A = Area in hectares.

b) Estimate the sewage generated in the municipality assuming that per capita water consumption is 120 L per day and assuming evaporation loss of 20 percent. Compare the figure with the results obtained in (a).

«« The End »»

KEY: [C]

समय: ४५ मिनेट

विषय: सिवा सम्बन्धी

पूर्णाङ्क: १००

परीक्षार्थीले उत्तरपुस्तिकाभा अनिवार्य रूपमा की (KEY) उल्लेख गर्नुपर्नेछ । अन्यथा उत्तरपुस्तिका रद्द हुनेछ ।
परीक्षामा मोबाइल, क्याल्कुलेटर लगायतका कुनै पनि विद्युतीय उपकरणहरू प्रयोग गर्न पाइने छैन ।

50×2=100 Marks

Multiple Choice Questions

- In ordinary residential and public building, the damp proof course is generally provided at
A. Ground level
☒ C. Plinth level
B. Water table level
D. Midway of ground level and water table level
- Slump test is used for
☒ A. Workability
B. Compressive strength
C. Gradation
D. Curing
- Which of the following is a remedial measure to prevent dampness?
A. Provision of sill bands
☒ C. Cavity wall construction
B. Provision of lintel bands
D. None of the above
- Water for domestic consumption should be
A. Colorless, odourless and tasteless
☒ C. Hygienically safe
B. Free from dissolved salts
D. Attractive for looks
- In pumping stations the type of joint generally used is
A. Socket and spigot joint
☒ B. Flanged joint
C. Flexible joint
D. Expansion joint
- For designing water tank in remote area of Nepal how much (Domestic demand) daily water demand needs to be considered ?
☒ B. 45 litres
A. 25 litres
D. 95 litres
C. 85 litres
- The sewerage system originate from
A. Lateral sewer
☒ D. House sewer
B. Branch sewer
C. Main sewer
- Water is lost in the irrigation canals through
A. Seepage
☒ D. All of the above
B. Evaporation
C. Transpiration
- Which of the following is a surface irrigation method ?
☒ D. All of the above
A. Flooding method
B. Furrow method
C. Contour method
- The duty of water at the outlet is also known as
☒ D. Outlet factor
A. Time factor
B. Capacity factor
C. Full supply coefficient

By: Khem
Raj Sijapati

C-1, इन्जिनियरिङ सेवा, सिभिल समूह, सहायक पाँचौ तह, सब-इन्जिनियर पद

11. For cereal crops, the most commonly adopted method of irrigation is
 A. Sprinkling method
 C. Furrow method
 B. Check method
 D. Free flowing method
12. Irrigation canals are generally aligned along
 A. Contour line
 C. Straight line
 B. Water shed
 D. Valley line
13. When irrigation canal and the drainage are at the same level then the cross drainage work is achieved by providing a
 A. Aqueduct
 C. Level crossing
 B. Supper passage
 D. Canal syphon
14. In hill roads, the side drains are generally provided
 A. Along the hillside only
 C. Both A and B
 B. Along the outer side only
 D. No drains needed
15. The portion of the road section which is used for vehicular traffic is known as
 A. Carriage way
 C. Highway
 B. Express way
 D. Shoulder
16. The top of the ground on which the foundation of road rests is called
 A. Base
 C. Soling
 B. Subgrade
 D. Wearing layer
17. The radius of curvature provided along a transition curve is
 A. Minimum at the beginning
 B. Same throughout its length
 C. Equal to the radius of circular curve
 D. Varying from infinity to the radius of circular curve
18. The length of abutment of the bridge at top is normally equal to
 A. Shoulder width
 C. Carriage way
 B. Lane width
 D. Formation width
19. A kind of slope provided to the road surface in the transverse direction to drain-off rainwater from the road surface is called as
 A. Set back
 C. Camber
 B. Cross section
 D. None of the above
20. Cement Plaster work in a building is measured in
 A. M
 C. M³
 B. M²
 D. None of the above
21. The calculation and determination of price of an existing building is termed as
 A. Specification
 C. Valuation
 B. Rate analysis
 D. All of the above
22. Negative float for any activity means that the activity is
 A. Normal
 C. Sub-critical
 B. Critical
 D. Super-critical
23. Relation between consultant contractor and owner should be
 A. Cooperative with each other
 B. Coordinated with each other
 C. Problems solving with understanding and discussion
 D. All of the above
24. In Nepal, Public Procurement Act was enacted in
 A. 2055 BS
 C. 2059 BS
 B. 2065 BS
 D. 2063 BS

By: Khem Raj
Sijapati

C-2, इन्जिनियरिङ सेवा, सिभिल समूह, सहायक पाँचौ तह, सब-इन्जिनियर पद

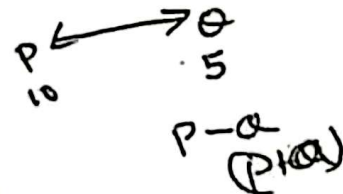
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* In hill curve or curve from centre of road

* In municipal Bylaw :- edge to edge

By: Khem Raj
Sijapati

25. Set back in Municipal Bylaws means
 A. Distance between edge of road to edge of building
 B. Distance between centre of road to edge of building
 C. Distance between two edges of road
 D. None of the above
26. Bench mark is a
 A. Point of known elevation
 C. Reference point
 B. The very first station
 D. The last station where the survey closes
27. A traverse deflection angle is
 A. Less than 90°
 B. More than 90° but less than 180°
 C. The difference between the included angle and 180°
 D. The difference between 360° and the included angle
28. Profile levelling is usually done for determining
 A. contours of an area
 C. area of forest zone
 B. capacity of a reservoir
 D. elevations along a straight line
29. A kind of survey in which field observation and plotting in graphical representation go simultaneously is
 A. Theodolite survey
 C. Plane table survey
 B. Tape survey
 D. Chair survey
30. Which of the following is a non ferrous metal?
 A. Cast iron
 C. Aluminium
 B. Mild steel
 D. All of the above
31. The process of giving definite and regular shape with smooth faces is known as
 A. Pitching
 C. Dressing
 B. Seasoning
 D. Quarrying
32. Ultimate strength to cement is provided by
 A. Tri-calcium silicate
 C. Tri-calcium aluminate
 B. Di-calcium silicate
 D. Tetra-calcium aluminosilicate
33. Which of the following paint is used for preservation of iron and steel surfaces?
 A. Cement paint
 C. Anti corrosive paint
 B. Primary paint
 D. Luminous paint
34. The bending moment in a beam will be maximum where
 A. the shear force is maximum
 C. the shear force is zero
 B. the shear force is minimum
 D. the shear force is zero
35. If two force P and Q ($P > Q$) act on the same straight line but in opposite direction, their resultant is
 A. $P+Q$
 C. $Q-P$
 B. $P-Q$
 D. Q/P
36. Which of the following type is a form of shear reinforcement?
 A. Stirrups
 C. Combination of stirrups and inclined bars
 B. Inclined bars
 D. All of the above
37. The maximum bending moment of a simply supported beam of span 'l' and carrying a point load 'W' at the center of beam is
 A. $W.l/4$
 C. $W.l$
 B. $W.l/2$
 D. $W.l^2/4$



38. Centre of pressure of a plane surface immersed in a liquid is
A. Above the centre of gravity of the plane surface
B. At the centre of gravity of the plane surface
C. Below the centre of gravity of the plane surface
D. None of the above

By: Khem Raj
Sijapati

39. Frictional loss of head includes the loss of energy due to
A. Viscosity
B. Turbulence
C. Both A and B
D. None of the above
40. The discharge through a V-notch varies as
A. $H^{1/2}$
B. $H^{3/2}$
C. $H^{5/2}$
D. $H^{2/3}$
41. Pressure can be determined by
A. Force per unit area
B. Force per area square
C. Force per volume
D. None of the above
42. Who coined the term soil mechanics?
A. Tarzaghi
B. Casa Grande
C. Newmark
D. Rankine
43. The property of soil which allows water to flow through the soil is known as
A. Permeability
B. Capillarity
C. Viscosity
D. Fluidity
44. Compaction of soil is aimed at
A. Decreasing dry density
B. Increasing porosity
C. Decreasing voids ratio
D. Decreasing shear strength
45. Which of the following is a factor that affect compaction of soil?
A. Moisture content of the soil
B. The compaction effort
C. Both A and B
D. None of the above
46. In a singly reinforced beam if the permissible stress in concrete reaches earlier than the permissible stress in steel, the beam section is called
A. Over reinforced section
B. Under reinforced section
C. Economic section
D. Critical section
47. The algebraic sum of the vertical forces on either side of the section of a loaded beam is called
A. Bending moment
B. Shear force
C. Shear Stress
D. Axial load
48. The minimum length of a bar which must be embedded in concrete beyond any section to develop bond is termed as
A. Stirrups
B. Lapping
C. Development length
D. All of the above
49. The minimum number of longitudinal steel bars in RCC circular column must be
A. 2
B. 6
C. 4
D. 8
50. A temporary structure erected with a purpose of providing a safe working platform is known as
A. Shore
B. Centering
C. Rake
D. Scaffolding

समाप्त

Supported By Nims Institute Bagbazar

प्रदेश लोक सेवा आयोग, मधेश प्रदेश

इंजिनियरिंग सेवा, सिभिल समूह, जनरल/हाइवे/इरिगेशन उपसमूह, सहायक पाँचो तहको प्रतियोगितात्मक लिखित परीक्षा
मिति: २०७९/१२/१८

Key (A)

समय : ४५ मिनेट

पूर्णाङ्क: १००

विषय: सेवा सग्यन्धी

वस्तुगत बहुदेकालिक प्रश्नपत्र (५० X २ अंक) :

उत्तरपुस्तिकामा प्रश्नपत्रको Key अनिवार्य उल्लेख गर्नुपर्नेछ । Key उल्लेख नगरेमा उत्तरपुस्तिका रद्द हुनेछ । साथै परीक्षामा Calculator, Mobile, Smart Watch वा यस्तो प्रकारका कुनै विद्युतीय उपकरणहरू प्रयोग गर्न पाइने छैन ।

- 1) A staff reading taken on a point whose elevation is to be determined as on a change print is called
(A) Fore sight reading (B) Back sight reading (C) Intermediate sight (D) None of above
- 2) Temporary adjustment of Theodolite includes:
(A) Centering (B) Levelling (C) Focusing (D) All of the above
- 3) The method of levelling used to carry out the reconnaissance of area is
(A) Check levelling (B) Fly levelling (C) Profile levelling (D) Simple levelling
- 4) The method of plane tabling generally adopted to obtain details and plotting inaccessible points is
(A) Radiation (B) Intersection (C) Resection (D) All of the above
- 5) A sedimentary rock of calcareous variety having specific gravity 2.6 is called
(A) Marble (B) Kankar (C) Sandstone (D) Limestone
- 6) Retarding admixtures are used during concreting to:
(A) Increase the final setting time of concrete (C) Decrease the final setting time of concrete
(B) Increase the initial setting time of concrete (D) Decrease the initial setting time of concrete
- 7) The alumina gives quick setting property in cement. The content of alumina in cement is
(A) 63% (B) 22% (C) 6% (D) 3%
- 8) How much is minimum compressive strength of 'A' class Brick?
(A) 54 Kg/Cm² (B) 154 Kg/Cm² (C) 254 Kg/Cm² (D) 354 Kg/Cm²
- 9) The maximum stress a material can withstand is known as:
(A) Strain (B) Deflection (C) Ultimate Tensile Strength (D) Shear Force
- 10) The shear force and bending moment are related by:
(A) $V = M/Z$ (B) $V = MY/I$ (C) $V = dM/dx$ (D) $V = Mdx$
- 11) Strut is a
(A) Horizontal member (B) Vertical member (C) Inclined member (D) Compression member
- 12) When a body is subjected to three mutually perpendicular stresses of equal intensity, the ratio of direct stress to the corresponding volumetric strain is known as:
(A) Bulk modulus (B) Young modulus (C) Hooks law (D) None of above
- 13) Poise is the unit of
(A) Mass density (B) Kinematic viscosity (C) Viscosity (D) Pressure gradient
- 14) The upper surface of the notch over which water flows, is known as
(A) Vein (B) Nappe (C) Sill (D) None of the above
- 15) Manning's Formula is used to find Velocity of a fluid in:
(A) Pipe (B) Tunnel (C) Open Channel (D) Ground Water Flow

जनरल/हाइवे/इरिगेशन, पाँचो तह -A-1-

- 16) The ratio of specific weight of a liquid to the specific weight of pure water at a standard temperature (4°C) is known as:
- (A) Specific volume (B) Weight density (C) Mass density (D) Specific gravity
- 17) Shearing Strength of Cohesion less soil depends upon:
- (A) Dry density (B) Void ratio (C) Loading rate (D) Normal stress
- 18) Bulk density of soil is taken as:
- (A) 600 Kg/m^3 (B) 1600 Kg/m^3 (C) 2600 Kg/m^3 (D) 3600 Kg/m^3
- 19) The ratio of the total mass (m) of the soil to the total volume (v) of the soil is known as:
- (A) Specific gravity (B) Bulk density (C) Moist density (D) Both B and C
- 20) Permeability of a soil is affected by:
- (A) Size of soil particle (C) Degree of Saturation
(B) Void ratio (D) All of the above
- 21) In a doubly reinforced beam the maximum shear stress occurs
- (A) Along the centroid
(B) Along the natural axis
(C) On planes between neutral axis and the tensile reinforcement
(D) On planes between neutral axis and the compressive reinforcement
- 22) In singly reinforced beam, steel reinforcement is provided in
- (A) Compression zone (B) Tensile zone (C) At neutral axis (D) All of the above
- 23) One way slab has its Length: Breadth Ratio;
- (A) Equal or greater than 2 (C) Equal or greater than 4
(B) Equal or greater than 0.2 (D) Equal or greater than 0.4
- 24) For bars in tension a standard hook has an anchorage value equivalent to a straight length of
- (A) 8ϕ (B) 12ϕ (C) 16ϕ (D) 20ϕ
- 25) Shoring is used during trench excavation to:
- (A) Control seepage (C) Control side collapse
(B) Control quick sand condition (D) All of the above
- 26) Which boring method is a very fast method of advancing hole in both rock and soil
- (A) Rotary boring (B) Wash boring (C) Auger boring (D) All of the above
- 27) In stairs, flier is a
- (A) Straight step having parallel width of tread
(B) The under surface of stair
(C) Series of steps without any platform in their direction
(D) Moulding provided under nosing
- 28) If the load of the super structure is heavy and its distribution is uneven then we perform the
- (A) Shallow foundation (B) Steep footing (C) Pier foundation (D) Pile foundation
- 29) In water distribution system, the mains, sub mains and branches are interconnected with each other is called
- (A) Dead end system (B) Grid iron system (C) Ring system (D) Radial system

लुम्बिनी प्रवेश

प्रदेश निजामती सेवा अन्तर्गत इञ्जिनियरिङ सेवा, सिविल समूह, एकीकृत उपसमूह, सहायक पांचौ तह,

सबद्धिज्जिनियर पदको प्रतियोगितात्मक लिखित परीक्षा

मिति : २०७९/१२/१८ गते - विहान ११:०० बजे

KEY: (A)

पूजांड : १००

समय : ४५ मिनेट

विषय : सेवा सम्बन्धी ।

उत्तरपुस्तिकामा प्रश्नपत्रको KEY अनिवार्यरूपले उल्लेख गर्नु पर्नेछ । उल्लेख नगरेमा उत्तरपुस्तिका रद्द हुनेछ ।
परीक्षामा mobile, calculator आदिको प्रयोग गर्न पाइने छैन ।

वस्तुगत बह्वैकल्यिक :

$$40 \times 2 = 80$$

1. सरकारी कार्यालयका सम्बन्धमा तलका भनाइ विचार गर्नुहोस् र सही उत्तर छनोट गर्नुहोस् ।
 i) कार्यालयमा सञ्चारको महत्त्व न्यून हुन्छ
 ii) कार्यालयमा मानवीय तथा भौतिक स्रोतको प्रयोग हुन्छ
 iii) कार्यालयको उद्देश्य नाफा आर्जन गर्नु हो
 iv) कार्यालयले व्यवस्थापकीय नियन्त्रणको रूपमा काम गर्दछ
 A) (i) र (ii) ठिक तथा (iii) र (iv) बेठिक
 B) (i) र (iii) बेठिक तथा (ii) र (iv) ठिक
 C) (i) र (iv) ठिक तथा (ii) र (iii) बेठिक
 D) सबै ठिक
 2. अति महत्त्वपूर्ण अभिलेखमा तलको कुन अभिलेख समावेश हुन्छ ?
 A) नक्सा सिमाना सम्बन्धी कागजात
 B) ठेक्कापट्टा सम्बन्धी कागजात
 C) लेखापरीक्षण सम्बन्धी कागजात
 D) परिपत्र
 3. निजामती सेवालाई समावेशी बनाउन तोकिए बमोजिम दलित उम्मेदवारले कति प्रतिशत आरक्षण पाउँछन् ?
 A) ३३%
 B) ९%
 C) ५%
 D) ४%
 4. निजामती कर्मचारीलाई कार्यसम्पादन मूल्यांकन बापत अधिकतम कति अंक दिने व्यवस्था छ ?
 A) १०० अंक
 B) ४० अंक
 C) २५ अंक
 D) १० अंक
 5. नेपालमा मध्यकालीन खर्च संरचना (Midterm expenditure framework- MTEF) लाई कहिलेदेखि प्रयोगमा ल्याइएको हो ?
 A) आ.व.०५४/५५
 B) आ.व.०५५/५६
 C) आ.व.०६१/६२
 D) आ.व.०५९/६०
 6. लम्बाइ मापन गर्दा बढी शुद्धता (Accuracy) पाउन के गर्नु पर्ला ?
 A) चेनवाट मापन गर्ने
 B) टेपवाट मापन गर्ने
 C) एवनी लेभलवाट मापन गर्ने
 D) टेकोमिटरवाट मापन गर्ने
 7. कन्टुर म्यापमा कन्टुरहरु एकै ठाउँमा जोडिए भने यस्तो ठाउँले के जनाउँछ ?
 A) सम्म परेको ठाउँ
 B) भुण्डिईरहेको चट्टाने पहाड भएको ठाउँ
 C) उखडबाखड ठाउँ
 D) एकतर्फ स्लोप भएको ठाउँ
 8. In precision theodolite traverse for road and railways, the angular error of closure should not exceed -
 A) $15''\sqrt{N}$
 B) $30''\sqrt{N}$
 C) $1'\sqrt{N}$
 D) $45''\sqrt{N}$
 9. Which of the following is the first principle of surveying?
 A) Whole to whole
 B) Part to part
 C) Part to whole
 D) Whole to part
 10. सामान्यतया छाना छार्न कुन चट्टान प्रयोग गरिन्छ ?
 A) Granite
 B) Quartz
 C) Slate
 D) Marble
 11. For $1m^3$ of M_{20} (1:1.5:3) Concrete, number of cement bags required are,
 A) 6.4 bags
 B) 7 bags
 C) 8 bags
 D) 9.5 bags

12. The standard size of masonry brick is :
 A) 18cm x 8cm x 8cm
 B) 19cm x 9cm x 9cm
 C) 20cm x 10cm x 10cm
 D) 21cm x 11cm x 11cm
13. Which one is correct?
 A) PPC gains strength slowly as compared to OPC
 B) Ultimate strength of PPC is higher than OPC
 C) PPC has higher resistance of chemical attack
 D) All of the above
14. कुनै Simply supported beam मा अधिकतम Shear Force कहाँ पर्दछ ?
 A) Mid – Span
 B) $\frac{1}{4}$ Span
 C) $\frac{1}{8}$ Span
 D) Support
15. A cantilever beam 2 meter long with 5 ton load at the free end will have –
 A) 2 ton shear force at supporting end
 B) 5 ton shear force at supporting end
 C) 10 ton shear force at supporting end
 D) None of the above
16. V is velocity of flow, G is acceleration due to gravity, then $v^2/2g$ is known as –
 A) Pressure energy
 B) Kinetic energy
 C) Datum energy
 D) Potential energy
17. The major function of a hydraulic fluid is –
 A) To provide energy transmission
 B) To enables work and motion
 C) To transfer heat and contamination control
 D) All of the above
18. Which of the following is not a discharge measuring device or structures?
 A) Venturimeter
 B) Pressure gauge
 C) Weir
 D) Notches
19. Reynolds number is ratio of initial force and
 A) Viscosity
 B) Surface tension
 C) Elasticity
 D) None of the above
20. Soil mechanics is used to analyze :
 A) Deformation of fluids within natural structure
 B) Deformation of fluids within manmade structure
 C) Both of above
 D) None of the above
21. Coefficient of lateral earth pressure is the ratio of –
 A) Horizontal stress of vertical stress
 B) Vertical pressure downwards to vertical pressure upwards
 C) Pressure of soil to pressure of soil when saturated
 D) Shear force in soil when pressure is applied laterally
22. The angle of internal friction depends upon –
 A) The practice shape and roughness
 B) The amount of interlocking
 C) Normal direct pressure
 D) All of the above
23. Bulk density of typical soil is :
 A) 20 KN/m³
 B) 15 KN/m³
 C) 10 KN/m³
 D) 5 KN/m³
24. In a RCC section, actual neutral axis is above the critical neutral axis, it is termed as :
 A) Balanced section
 B) Over reinforced section
 C) Under reinforced section
 D) None of above
25. Doubly reinforced beams mean –
 A) Beam with two layers of tension bars
 B) Beam with both tension and compression bars
 C) Bars are provided double than what calculation gives
 D) None of above

26. The development length of bars in tension as per IS : 456 is given by,
 A) $4\sigma_s/\tau_{bd}$ B) $2\sigma_s/3\tau_{bd}$ C) $\sigma_s/4\tau_{bd}$ D) $\sigma_s/5\tau_{bd}$
27. Which of the following is not a type of load-bearing wall?
 A) Solid masonry wall B) Panel wall C) Cavity wall D) Faced wall
28. The Role of building technology :
 A) To improve decision making B) To give information about possible impacts
 C) Both of above D) None of the above
29. कुनै mix मा १ चोरा cement प्रयोग हुँदा १० लिटर पानी प्रयोग भयो भने water cement ratio कति हुन आउँछ?
 A) 0.50 B) 0.40 C) 0.30 D) 0.20
30. Aeration of water is done to remove –
 A) Odour B) Color C) Bacteria D) Hardness
31. Which of the following valve is used to prevent the product of flow in wrong direction –
 A) Butterfly valve B) Check valve
 C) Pressure relief valve D) None of the above
32. The distribution mains in water supply system are designed for :
 A) Maximum daily demand
 B) Peak hourly demand
 C) Average daily demand
 D) Maximum hourly demand on maximum consumption day
33. The sludge does not contain waste water from –
 A) Bathrooms B) Wash basins C) Kitchen sinks D) Toilets
34. The rate of flow in Artesian Spring is continuous and,
 A) Increases in rainy season B) constant in all conditions
 C) Increases as water table rises D) Decreases in drought season
35. At which point in the entire canal system the duty of water will be more?
 A) Head of water course B) Head of secondary canal
 C) The head of a main canal D) Same at all places
36. The irrigation is necessary in an area –
 A) Where there is a scanty rainfall
 B) Where the rainfall is non-uniform
 C) Where commercial crops requires more water
 D) All of the above
37. When a canal is carried over a natural drainage, the structure provided is known as :
 A) Siphon B) Super passage C) Aqueduct D) Siphon-aqueduct
38. कुन सिंचाई प्रणालीमा थोरै पानीबाट धेरै सिंचाई गर्न सकिन्छ ?
 A) Furrow irrigation B) Lift irrigation C) Surface irrigation D) Sprinkle irrigation
39. Lands or climate that lack sufficient water for agriculture without artificial irrigation, are called –
 A) Dry zone B) Arid zone C) Semi-arid zone D) Hybrid arid zone
40. The interface treatment provided to plug in the voids of porous, surface and to bond loose particles in bituminous pavement is called;
 A) Tack coat B) Seal coat C) Prime coat D) Surface dressing
41. Which is the first Road in Nepal to connect Kathmandu valley with the outside world :
 A) Araniko highway B) East-west highway
 C) Pasang Lhamu highway D) Tribhuvan highway

42. The camber provided for earthen road, is :
 A) 3% B) 4% C) 5% D) 7%
43. The portion of road surface which is used by the vehicular traffic is known as;
 A) Shoulder B) Carriage way C) Formation width D) Right of way
44. Drain in hill road is provided –
 A) Hill side of road B) Outer side of road
 C) Both side of road D) None of the above
45. निर्माण कार्यको specification ले के कुरालाई जनाउँदैन ?
 - A) Quality of works B) Quantity of works
 C) Nature of works D) Class of work materials
46. The item of steel work which is measured in sqm, is –
 A) Collapsible gates B) Rolling shutters
 C) Ventilators and glazing D) All of the above
47. Estimate expected to be least accurate is :
 A) Supplementary estimate B) Plinth area estimate
 C) Detailed estimate D) Revised estimate
48. The defect liability period (DLP), in general, is -
 -A) One year from date of completion B) Two year from date of completion
 C) Six month from date of completion D) Nine month from date of completion
49. The conception of idea for any construction on work is the responsibility of :
 A) Engineer B) Contractor C) Owner D) All of the above
50. Bid document मा BOQ के प्रयोजनको लागि राखिन्छ ?
 A) आइटमवाइज दर अफर गर्न B) प्राविधिक स्पेसिफिकेशन विस्तृतिकरण गर्न
 C) विस्तृत नाप-नक्सा देखाउन D) विस्तृत शर्तहरू उल्लेख गर्न

The End

लोक सेवा आयोग

नेपाल इन्जिनियरिङ सेवा, सिगिल समूह अन्तर्गतका जेनरल, हाईवे, स्वामीटरी, इरिगेसन, हाइड्रोलोजी समूह, राजपत्र अनङ्कित प्रथम श्रेणी, (प्राविधिक) पदको प्रतियोगितात्मक लिखित परीक्षा
मिति: २०७९/११/३०

समय: २ घण्टा १५ मिनेट

पत्र:- द्वितीय

पूर्णाङ्क : १००

विषय:- सेवा सम्बन्धित कार्य-ज्ञान

निम्न प्रश्नहरूको उत्तर Section अनुसार छुट्टाछुट्टै उत्तरपुस्तिकामा 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»»»

नेपाल विद्युत प्राधिकरण, प्राविधिक, सिभिल, सातौं, इन्जिनियर पदको खुला प्रतियोगितात्मक लिखित परीक्षा
२०८२/०३/१६

पत्र : द्वितीय
समय : ३ घण्टा

पूर्णाङ्क : १००

विषय : सेवा सम्बन्धी विस्तृत ज्ञान

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

Section : "A"

50 Marks

1. List some of the most popular methods used for computation of peak runoff rate in Nepal. $Q = \frac{CIA}{360}$, Ryves $Q = 1.484 A R^{0.74}$, Dicken $Q = 2.77 A R^{0.77}$, Carrington $Q = 0.00077 A R^{0.77}$ → Unit hydrograph → Encumbent's extra 5
2. Explain firm and secondary energy with regard to load curve in Nepal. → 5
3. Identify all losses in the hydraulic system of a typical hydropower project involving tunnel system for water conveyance. Discuss steps involved in calculation of Net-Head for hydropower project. 6+4=10
4. What are the different types of Turbines used in hydropower projects? What are the key factors that govern selection of appropriate turbine? Also, discuss the types of generators and their use in brief. 3+3+4=10
5. What is understood by the optimization of any components of hydropower projects? What are the objectives of optimization? Explain with mathematical expression the optimization of Penstock. 2+3+5=10
- * 6. As per the "Guidelines for Study of Hydropower Projects" issued by DoED (Government of Nepal), what are the major study requirements related to topographical and construction material surveys for a medium sized (10-50MW) project? Explain. 10

new quarry
quality
quantity → आगोस आगोस

Section : "B"

50 Marks

7. Describe in brief the types of admixtures and their uses in cement concrete. 5
8. How is the 'Drawing Scale' selected for the purpose of drawing? Discuss the methods of showing dimension in drawing. → undirected, aligned. 2+3=5
9. Introduce trigonometric levelling and its use. Explain in brief the methods of contouring. → triangle and distance measurement. 4+6=10
10. What are the key properties of civil engineering construction materials that affect the appearance, strength, durability and serviceability of the structure built? List out the characteristics of good quality bricks. → Soundness 5+5=10
11. Explain the concept of limit state design. Discuss the various aspects or criteria related to limit state of collapse and serviceability which must be examined in design. 3+7=10
12. Explain in brief the different types of estimates and their uses. What are the requirements of a good estimate? Discuss the basic components of 'Rate Analysis' in civil construction works. 3+3+4=10

detour
detour
Unidirectional
Aligned
Aligned

- The End -

→ preliminary → cubic scale
→ supplementary → planific area
→ revised → detailed (1757)

map. contour
map
reservoir
capacity

indirect.
square
cross
section

प्रदेश लोक सेवा आयोग
लुम्बिनी प्रदेश
प्रदेश निजामती सेवा अन्तर्गत प्रदेश इञ्जिनियरिङ्ग सेवा, सिभिल समूह, स्यानिटरी/इरिगेशन उपसमूह
सहायकस्तर पाँचौं तह, (प्राविधिक) सब-इञ्जिनियर पदको खुला तथा समावेशी प्रतियोगितात्मक लिखित परीक्षा
(द्वितीय चरण)
मिति: २०८२।०२।०९ गते

समय: २ घण्टा १५ मिनेट
विषय: सेवा सम्बन्धी कार्य ज्ञान
परीक्षा समय: दिनको ४:०० बजे
पूर्णाङ्क: १००

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

Section-A Marks-50

1. What are the principles of levelling? Explain in brief. [5]
2. Describe the merits and demerits of random rubble stone masonry. [5]
3. Describe with illustrations how the shear force and bending moment occur in a simply supported beam with uniformly distributed loading. [5]
4. List out any five properties of fluid. [5]
5. Describe the different types of soil with its classification for civil engineering purpose. [5]
6. What is anchorage length? Explain its significance in reinforced concrete design. [2+3=5]
7. What do you mean by under-reinforced, over-reinforced and balanced section? Which is the most economic section and how can it be achieved? [5+5=10]
8. Briefly describe the type of paints and varnishes. Also list out the characteristics of good paints. [5+5=10]

Section-B Marks-50

9. Define the water cement ratio and explain in brief the factors affecting the strength of concrete. [1+4=5]
10. What types of sources of water are used in water supply system? Which ecological regions are suitable for the supply of surface water and ground water sources in water supply systems? [5]
11. Mention briefly how the irrigation canal section is designed. [5]
12. What are the differences between super elevation and camber? [5]
13. Describe how the unit rate of an item of works is derived for cost estimation. [5]
14. List out the documents which are included in contract document. [5]
15. What do you mean by HGL in pipeline design? Draw HGL for the pipeline having length of 4 km, 200 mm in diameter with roughness coefficient of 0.015 connecting two reservoirs for design discharge of 48 Lps. [2+8=10]
16. Briefly explain the historic development of roads in Nepal and classification of roads. [10]

*** The End ***

प्रदेश लोक सेवा आयोग, कर्णाली प्रदेश
प्रदेश इन्जिनियरिङ सेवा, सिभिल समूह, एकीकृत उपसमूह, सहायक पाँचौं तह, सब-इन्जिनियर
पदको खुला प्रतियोगितात्मक लिखित परीक्षा
मिति: २०८२।०२।०३

चरण: प्रथम

पत्र: द्वितीय

पूर्णाङ्क: १००

विषय: प्राविधिक विषय

समय: २ घण्टा १५ मिनेट

सबै प्रश्नहरू अनिवार्य छन्। प्रत्येक खण्डको उत्तर छुट्टाछुट्टै उत्तरपुस्तिकामा लेख्नुपर्नेछ
अन्यथा उत्तरपुस्तिका रद्द हुनेछ।

Section-A

45 Marks

1. Define closed traverse. Why checks are necessary in closed traverse? (2+3)
2. What are the common types of bricklaying used in our country? Briefly explain the process of any one type of bricklaying. (2+3)
3. A circular rod of steel with 10 mm diameter is tested for tension and it was observed that when tension was 11 KN, the total extension on a 300 mm length was 0.20 mm. Find the value of Young's modulus of elasticity 'E'. (5)
4. What is the relationship between dry density and moisture content in soil compaction? (5)
5. Explain the different types of welded joints with neat sketches. (5)
6. What is the difference between a long column and a short column in RCC structures? How does slenderness ratio influence their behavior? (5+5)
7. Briefly explain the key factors affecting the strength of concrete. (10)

Section-B

45 Marks

8. What are head losses in fluid flow through pipes? Differentiate between major and minor head losses. (3+2)
9. What are canal losses? Enlist the methods for minimization of canal losses. (2+3)
10. List the components of road pavement? Explain with diagram. (2+3)
11. Describe the duties of Sub Engineer during preparation of estimates. Prepare the format of rate analysis for estimate. (3+2)
12. What are the minimum information required in notice of invitation for bids? (5)
13. What are the components of a typical gravity flow water supply project in hilly areas? Provide a sketch showing all the components. (5+5)
14. Discuss and explain about different types of road maintenance. How is road maintenance work being carried out in Nepal? (7+3)

Section-C

10 Marks

15. Brief the challenges from social prospective of fixing alignment of pipe line for water supply in Karnali Province. (5)
16. What are the main objectives of the current periodic plan of Karnali Province? (5)

-Good Luck-

प्रदेश लोक सेवा आयोग

कोशी प्रदेश, विराटनगर

प्रदेश निनामती तथा स्थानीय सरकारी सेवा अन्तर्गत प्राविधिवा तथा इन्जिनियरिंग सेवा, सिधिल समूह,
जनरल/हाइवे/स्यानिटरी/इरिगेसन उपसमूह, सहायकतार पाँची तह, सब इन्जिनियर/पा.पा.स.टे. वा सो सरत पवको सुला
प्रतियोगितात्मक लिखित परीक्षा

मिति:- २०८२/०२/०३

समय: २ घण्टा ३० मिनेट

पत्र: द्वितीय

विषय: सेवा सम्यन्धी विषय

पूर्णाङ्क: १००

सबे प्रश्नहरू अनिवार्य छन् । प्रश्नहरूको उत्तर खण्ड (Section) अनुसार बेलाबेलै नभरपुग्नुतथा लेख्नुपर्नेछ अन्यथा उत्तरपुग्नुतथा
रद्द हुनेछ । परीक्षामा मोवाइल लगायतका विद्युतीय उपकरणहरू प्रयोग गर्न पाइने छैन ।

Section - A

Marks-45

1. सार्वजनिक सेवाको अर्थ उल्लेख गर्दै यसको महत्त्व माथि प्रकाश पार्नुहोस् । [2+3=5]
2. Define hollow bricks. What are the advantages and disadvantages of hollow bricks in the context of Nepal? [1+2+2=5]
3. What are the major raw materials used in the manufacturing of cement? What does the soundness of cement mean? [4+1=5]
4. How does a change in shear force affect the bending moment in a beam? Explain with examples. [5]
5. Define Pascal's law. What is the formula normally used to determine frictional loss in pressurized pipe flow and in non-pressurized irrigation canal? [1+4=5]
6. What is soil compaction? What are the key factors that affect the compaction of soil? [1+4=5]
7. Explain the importance of anchorage in reinforced concrete. What is the difference between short and long R.C. columns? [2+3=5]
8. Explain the purpose of surveying. What are the uses of theodolite? Describe the various sources of errors in theodolite survey. [3+3+4=10]

Section - B

Marks-55

9. Write short notes on the following: [2.5+2.5=5]
 - a. Water cement ratio
 - b. Formworks
10. What are the problems caused by dampness? Why is subsoil exploration done before building construction? [3+2=5]
11. What are the steps of rate analysis? Explain its importance. [2.5+2.5=5]
12. What is the importance of muster roll and what does it usually consist of? What are the differences between PERT and CPM network? [2.5+2.5=5]
13. How has the development of airports in Nepal impacted tourism and trade? [5]
14. Describe the various components of a gravity water supply system in the hilly area of Nepal, with a sketch. [10]
15. Describe the different methods of applying water in irrigation of fields. [10]
16. What is the administrative classification of roads in Nepal? What is camber? How is it different from super elevation? Explain the importance of road drainage in highway engineering. [4+1+2+3=10]

<<The End>>

प्रदेश लोक सेवा आयोग, कर्णाली प्रदेश
इञ्जिनियरिङ सेवा, सिभिल समूह, एकीकृत उपसमूह, सहायक पाँचौ तह, सव-इञ्जिनियर पदको खुला
प्रतियोगितात्मक लिखित परीक्षा
मिति: २०८२।०२।०३

KEY [B]

चरण/पत्र: प्रथम

समय: ४५ मिनेट

पूर्णाङ्क: १००

विषय: सामान्य ज्ञान र सार्वजनिक व्यवस्थापन/सेवा सम्बन्धी ज्ञान

अङ्कभार: ५०प्रश्न×२अङ्क=१००अङ्क

उत्तरपुस्तिकामा प्रश्नपत्रको KEY अनिवार्य रूपले उल्लेख गर्नुपर्नेछ। KEY उल्लेख नगरेमा
उत्तरपुस्तिका रद्द हुनेछ। परीक्षामा calculator, mobile प्रयोग गर्न पाइनेछैन।

1. To control of deflection, Span to effective depth ratio of cantilever beam is taken as;
A. 3 B. 5 C. 7 D. 9
2. The design strength of a short column is governed by;
A. Axial load capacity and bending strength
B. Axial load capacity and shear strength
C. Axial load capacity and concrete compressive strength
D. Axial load capacity and slenderness ratio
3. The method in which the structure is designed to withstand safely all loads liable to act on it throughout its life is called;
A. Limit state method B. Working stress method
C. Ultimate strength method D. Elastic theory method
4. A water tight structure constructed in connection with excavations for foundations of bridges, piers etc. is known as;
A. Box caisson B. Open caisson C. Pneumatic caisson D. All of the above
5. What is the primary benefit of well-graded aggregates in concrete?
A. Improved aesthetics B. Reduced cost
C. Decreased setting time D. Increased strength and workability
6. The floor height of the building is 2.70 m and the riser is 15 cm, the number of treads required is;
A. 17 B. 18 C. 19 D. 20
7. Which of the following causes major head loss in pipe flow?
A. Sudden expansion or contraction in pipe diameter
B. Bends, valves and fittings in the pipeline
C. Pipe friction over a long length
D. Changes in fluid temperature
8. Which of the following is a primary cause of head loss in fluid flow through pipes?
A. Friction between fluid and pipe surface B. Increased velocity of fluid
C. Decrease in pipe diameter D. Higher fluid temperature
9. The used water mixed with organic and inorganic solids, fluid waste from houses, factories and dry weather flow is called;
A. Sanitary sewage B. Sewage C. Raw sewage D. Crude sewage
10. Which parameter is crucial in determining the capacity of a septic tank?
A. The thickness of the tank's wall
B. The depth of ground water

P.T.O.

- C. The number of users and per capita waste water generation
 D. The type of soil around the tank
11. Which statement is true regarding Duty and Delta in irrigation?
 A. Duty increases as delta increases B. Duty decreases as delta increases
 C. Duty remains constant as delta varies D. Duty is higher with less water use
12. There is only one section and only one longitudinal slope at which the channel will carry a particular discharge with a particular silt grade is the saying of;
 A. Kennedy B. Lacey C. Darcy D. Terzaghi
13. Superelevation on a curve of road is provided to;
 A. Increase the friction between tires and roads
 B. Increase the radius of curve
 C. Counteract the centrifugal force acting on vehicles
 D. Improve the drainage of road
14. During the detailed survey of a hill road, the first operation of the survey team is to fix the;
 A. Level B. Coordinates C. Bench mark D. Magnetic north
15. Minimum value of superelevation is equal to;
 A. Ten percent B. Seven percent C. Four percent D. Equal to camber
16. Which method of valuation is commonly used for estimating the value of commercial properties based on their income-generating potential?
 A. Cost method B. Capitalization method
 C. Comparative method D. Scrap value method
17. Which factor is most crucial in determining the rate analysis of a construction item?
 A. Site condition B. Cost of materials and labors
 C. Project duration D. Dimensions of the construction item
18. Which of the following is one of the key responsibilities of a civil sub-engineer?
 A. Designing complex structural buildings
 B. Approving project budgets and financial allocations
 C. Supervising construction work and ensuring quality control
 D. Negotiating contracts with clients and stakeholders
19. Which type of contract transfers the maximum risk to the contractor?
 A. Cost-plus contract B. Unit rate contract
 C. Measurement contract D. Lump sum contract
20. As per public procurement act, 2063 the notice time given for short listed consultant to submit the request of proposal (RFP) is;
 A. 15 days B. 21 days C. 30 days D. 45 days
21. हिल्सा नाका नेपालको कुन जिल्लामा रहेको छ?
 A. मुगु B. दोलखा C. रसुवा D. हुम्ला
22. कर्णाली प्रदेशको क्षेत्रफल कति वर्ग किलोमिटर रहेको छ?
 A. ३०,२९९ B. ३९,४२२ C. २९,९२२ D. ३९,२९९
23. कर्णाली प्रदेशको दोस्रो पञ्चवर्षीय योजना अवधिमा वार्षिक औसत आर्थिक वृद्धिदर कति पुग्ने प्रक्षेपण गरिएको छ?
 A. ६.७% B. ७.६% C. ८.७% D. ९.९%

24. 'सबैको पहुँचमा सफा पानी र सरसफाइ पुऱ्याउने' दिगो विकासको कति नम्बर लक्ष्य हो?
A. लक्ष्य ६ B. लक्ष्य ४ C. लक्ष्य ३ D. लक्ष्य ७
25. तलकामध्ये नेपालको संविधानमा भएको नागरिकता सम्बन्धी कुन व्यवस्था सही छ?
A. जिल्ला पहिचान सहितको नागरिकता B. स्थानीय तह पहिचान सहितको नागरिकता
C. प्रादेशिक पहिचान सहितको नागरिकता D. माथिका सबै
26. विशाल खस राज्य स्थापना गर्ने पहिलो व्यक्ति को थिए?
A. भारद्वाज B. अशोक C. नागराज D. काधिल्ल
27. सर्वप्रथम Smallpox Vaccine पत्ता लगाउने वैज्ञानिक को थिए?
A. Edward Jenner B. Louis Pasteur C. Jonas Salk D. Claude Johnson
28. विमस्टेकको उद्देश्य तलकामध्ये कुन होईन?
A. अन्तर्राष्ट्रिय मञ्चमा साझा मुद्दा बकालत गर्ने B. सरल रूपमा ठूलो बजार बनाउने
C. व्यापार प्रवर्द्धनका लागि नयाँ क्षेत्रहरू पहिचान गर्ने D. प्रतिस्पर्धात्मक वातावरण बनाउने
29. संयुक्त अधिराज्य बेलायतसँग नेपालको दौत्य सम्बन्ध कहिले कायम भएको थियो?
A. वि.सं. १८७२ B. वि.सं. १८७३ C. वि.सं. १८७४ D. वि.सं. १८७५
30. क्षेत्रफलको हिसावले सबैभन्दा सानो हिमाली जिल्ला कुन हो?
A. म्याग्दी B. रसुवा C. पूर्वी रुकुम D. कालिकोट
31. प्रदेश निजामती सेवाका कर्मचारीको आफ्नो पदमाथिको पदाधिकार कायम रहने अवस्था कुन होईन?
A. निलम्बन रहेको अवधिभर B. काजमा रहेको अवधिभर
C. विदामा बसेको अवधिभर D. अर्को पदमा सरुवा भई जिम्मेवारी सम्हालेको अवधिभर
32. सरकारी कार्यालयमा अभिलेख व्यवस्थापनको मुख्य उद्देश्य के हो?
A. वित्तीय सूचनाहरूमात्र सुरक्षित राख्ने
B. अभिलेख सुरक्षित, व्यवस्थित र छिटो उपलब्धता सुनिश्चित गर्ने
C. पुरानो अभिलेख नष्ट नगरी नयाँ अभिलेख राख्ने
D. अभिलेखमा नागरिकको पहुँचलाई निषेध गर्ने
33. प्रदेश निजामती सेवाको कुनै कर्मचारीले अयोग्यताको कारण आफ्नो पदीय जिम्मेवारी पुरा गर्न नसकेमा कस्तो कारवाही हुन्छ?
A. तत्काल निलम्बन गर्ने।
B. योग्यताको कारण भएको हानीको क्षतिपूर्ति भराउने।
C. भविष्यमा सरकारी सेवाको निमित्त अयोग्य ठहरिने गरी सेवाबाट हटाउने।
D. भविष्यमा सरकारी सेवाको निमित्त अयोग्य ठहरिने गरी सेवाबाट बर्खास्त गर्ने।
34. तलकामध्ये कुन विषयलाई सुशासनको विशेषताको रूपमा लिईदैन?
A. कानूनको शासन B. कानूनद्वारा शासन C. सहभागिता D. जिम्मेवारीपन
35. हरेक सार्वजनिक निकायमा सार्वजनिक बडापत्र राख्नुपर्ने व्यवस्था कुन कानूनले गरेको हो?
A. भ्रष्टाचार निवारण ऐन, २०५९ B. सुशासन (सञ्चालन तथा व्यवस्थापन) ऐन, २०६४
C. निजामती सेवा ऐन, २०४९ D. सूचनाको हक सम्बन्धी ऐन, २०६४
36. कानूनी शासनको अवधारणा कसले प्रतिपादन गरेका हुन्?
A. ए. भि. डायसी B. जोन डाल्टन C. लुथर गुलिक D. म्याक्स वेबर

लोक सेवा आयोग

नेपाली सेना, सैनिक प्राविधिक, सैनिक इन्जिनियरिङ्ग, सिभिल तथा आर्किटेक्चर,
ओ.प्रा.सु. (सिभिल) पदको आन्तरिक तथा खुला प्रतियोगितात्मक लिखित परीक्षा
मिति: २०८२/१/२३

Key (B)

समय: १ घण्टा

पूर्णाङ्क: ७५

विषय: पेशा सम्बन्धी (वस्तुगत)

उत्तरपुस्तिकामा प्रश्नपत्रको Key अनिवार्य रूपले उल्लेख गर्नुपर्नेछ । Key उल्लेख नगरेमा उत्तरपुस्तिका रद्द हुनेछ । साथै, परीक्षामा Calculator, Mobile जस्ता विद्युतीय उपकरणहरू प्रयोग गर्न पाइने छैन ।

वस्तुगत बहुविकल्पिक (७५ प्रश्न × १ अङ्क = ७५ अङ्क):

- Slenderness ratio of column is defined as the ratio of length to its
(A) least lateral dimension (B) maximum lateral dimension
(C) least radius of gyration (D) maximum radius of gyration
- According to IS 456:2000, the minimum and maximum percentage of longitudinal reinforcement in a column (expressed in percentage of gross cross-sectional area of the column), are respectively
(A) 0.4 and 4 (B) 0.5 and 8 (C) 0.8 and 6 (D) 1 and 10
- Which of the following is a function of the transverse reinforcement in a column?
(A) To prevent buckling of longitudinal reinforcement (B) To prevent certain brittle failure
(C) To impart certain ductility to the column (D) To reduce effect of creep
- Design load in a RCC structure is
(A) dead load × partial factor of safety (B) characteristic load × partial factor of safety
(C) live load × 1.5 (D) none of the above
- In residential house, minimum live load to be considered in the design of floor slab is
(A) 5 kN/m² (B) 2 kN/m² (C) 4 kN/m² (D) 10 kN/m²
- The type of bitumen, which is most suitable in road pavement in order to prevent cracks and achieve durability and weather resistance is
(A) penetration grade bitumen (B) viscosity grade bitumen
(C) polymer modified bitumen (D) oxidized bitumen
- Range of absolute viscosity in at 60° for bitumen VG 40 is
(A) 800-1200 (B) 1600-2400 (C) 2400-3600 (D) 3200-4800
- The outside wall painting is
(A) readymade enamel paint (B) readymade aluminum paint (C) acrylic paint (D) red lead paint
- Which one of the following is an oil-based paint?
(A) Emulsion paint (B) Acrylic paint (C) Enamel paint (D) Latex paint
- Vehicle of paint is for
(A) making the paint thin (B) holding the ingredients of paint in liquid suspension
(C) accelerating the drying process of paint (D) none of the above

Contd...

11. For "Class A" or first-class bricks, the maximum allowable water absorption after 24 hours of immersion in cold water is typically
 (A) not more than 25-30% of their dry weight (B) not more than 35-40% of their dry weight
 (C) not more than 15-20% of their dry weight (D) not more than 5-10% of their dry weight
12. Which one of the following is best with consideration of strength?
 (A) Flemish bond (B) Stacking bond (C) English bond (D) Running bond
13. According to code NS 572 : 2076, after what duration of manufacturing should the cement, be tested for use?
 (A) two months (B) two and half months (C) three months (D) three and half months
14. Why Portland Pozzolana Cement (PPC) is considered over Ordinary Portland Cement (OPC)?
 (A) Because it emits less heat of hydration and prevent cracking in concrete surface
 (B) It keeps gaining compressive strength even after 28 days of casting
 (C) It is environmentally friendly and is cheaper
 (D) All of the above
15. Marble is a
 (A) igneous rock (B) sedimentary rock (C) metamorphic rock (D) granular rock
16. In terms of discharge magnitude per unit cross-sectional area, which one of the following is the most efficient cross-section?
 (A) Semi-circular (B) Rectangular (C) Trapezoidal (D) Triangular
17. Which geometric parameter determines the efficiency of the channel?
 (A) Hydraulic depth (B) Hydraulic radius (C) Normal depth (D) Section factor
18. The phenomenon occurring in an open channel when a rapidly flowing stream abruptly changes to a slowly flowing stream causing a distinct rise of liquid surface is
 (A) water hammer (B) hydraulic jump (C) critical discharge (D) none of the above
19. Discharge through a totally submerged orifice is directly proportional to
 (A) difference in elevation of water surface in the upstream and downstream
 (B) square root of the difference in elevation of water surfaces in the upstream and downstream
 (C) square root of the opening
 (D) reciprocal of the area of the opening
20. If V is the velocity of flowing fluid, R is the hydraulic radius, S bed slope of the channel and n is Manning's coefficient; the discharge Q formula is
 (A) $Q = A * 1/n * R^{2/3} * S^{1/2}$ (B) $Q = A * 1/n * R^{1/2} * S^{2/3}$
 (C) $Q = A * 1/n * R^{1/3} * S^{1/2}$ (D) $Q = A * 1/n * R^{1/2} * S^{1/2}$
21. The energy of flowing liquid due to its motion is
 (A) $1/2 * \text{mass} * \text{velocity squared} (1/2 * mv^2)$ (B) mass * volume of water per unit length
 (C) velocity squared / (2 time gravitational force) ($V^2/2g$) (D) none of the above
22. The discharge through a rectangular notch is given by
 (A) $2/3 cd \times L \times H^{3/2}$ (B) $2/3 cd \times L \times H^{5/2}$ (C) $2/3 cd \times L \times H^{3/2}$ (D) $2/3 cd \times L \times H^{1/2}$
23. Atmospheric pressure and are interrelated.
 (A) altitude (B) temperature (C) water condition (D) all of the above

Contd...

24. Total head of a liquid particle in motion is the sum of
(A) potential head and kinetic head (B) kinetic head and pressure head
(C) potential head and pressure head (D) potential head, kinetic head and pressure head
25. Pressure applied to an enclosed fluid will be transmitted without a change in magnitude to every point of the fluid and to the walls of the container is
(A) Boyle's law (B) Charles law (C) Pascal's law (D) Gay-Lussac's law
26. Specific weight of liquid
(A) remains constant at every place (B) does not remain constant at every place
(C) varies from place to place on the earth (D) does not vary on any other planet
27. Practical fluid posses
(A) viscosity (B) surface tension (C) compressibility (D) all of the above
28. Ratio of flow depth to pipe diameter in sanitary sewer design at peak flow is
(A) 1.00 (B) 0.83 (C) 0.85 (D) 0.81
29. Purpose of manholes is to permit inspection and cleaning as well as
(A) stormwater stands by tanks (B) at all pipe intersections
(C) to repair of sewers and removal of obstructions (D) all of the above
30. As the diameter of the sewer pipe increases, the self-cleaning velocity requirement
(A) also increases (B) decreases (C) is not a function of pipe diameter (D) none of the above
31. In self cleaning velocity,
(A) solid particles get settled at the bottom (B) solid particles will float on surface
(C) solid along with water move at very high speed (D) solid particles will remain in suspension
32. The factor affecting per capita demand is
(A) climatic conditions (B) size of the city (C) pressure in water mains (D) all of the above
33. The ratio of maximum to average flow in small sewers such as laterals is in the order of
(A) 7 (B) 6 (C) 4 (D) 5
34. A town has enough supply of domestic water, but the demand rates in certain hours of the day exceed the supply rates. The required storage tank capacity is determined by taking
(A) maximum of the deficits (B) sum of the deficits
(C) sum of the surpluses (D) minimum of the surpluses
35. A high velocity of wash water is required for
(A) rapid gravity filter with strainers (B) slow sand filter with strainers
(C) rapid gravity filter without strainers (D) none of the above
36. Which of the following can be identified as the objective of water supply scheme?
(A) Chlorination of water (B) Ionization of water (C) Treat water (D) Providing safe water supply
37. Recuperation test is carried out to determine
(A) turbidity of water (B) pH value of water (C) yield of well (D) discharge capacity of a well
38. If an upper impervious layer of a confined aquifer is drilled through and a piped well is constructed and water comes up to the ground surface without pumping, the tubewell is said to be
(A) an economical tubewell (B) a normal tubewell (C) an artesian well (D) a positive pressure tubewell

Contd...

39. Considering the following statements pertaining to the source of supply, choose a correct alternative.
 (A) groundwater has low organic content and high dissolved oxygen
 (B) lake water at bottom has silt and bacteria
 (C) river water in floods has low dissolved oxygen and colour
 (D) none of the above
40. Which one of the following is false with regard to freehand sketching?
 (A) Use of no proper scale
 (B) Using no proper instrument
 (C) Sketching an object as small as possible
 (D) Sketching at proper proportion
41. The structural drawings, in a civil engineering drawing consist of
 (A) plans of the structure
 (B) elevations of the structure
 (C) concrete and steel members details
 (D) 3D view of the civil engineering structure
42. The Department of Survey has produced topographical maps which are colloquially known as topo-sheets, covering entire Nepal. What are the scales of those toposheets?
 (A) 1:15,000 and 1:25,000
 (B) 1:25,000 and 1:50,000
 (C) 1:50,000 and 1:100,000
 (D) 1:100,000 and 1:125,000
43. In engineering drawings, graphical representations of specific features, instructions or components is called
 (A) features
 (B) symbol
 (C) signs
 (D) logo
44. In a topographic drawing the symbols representing natural features are drawn by free hand while artificial works are
 (A) freehand
 (B) mechanically
 (C) both (A) and (B)
 (D) none of the above
45. For making angles, which of the following drawing tool is used?
 (A) Protractor
 (B) Divider
 (C) Compass
 (D) French curve
46. A method of representing three-dimensional objects in two dimensions using multiple 2D views, typically front, top and side, where the lines of sight are perpendicular to the projection plane is called
 (A) orthographic projection
 (B) cylindrical projection
 (C) conical projection
 (D) azimuthal projection
47. Working drawing space on the paper is determined by
 (A) working line
 (B) drawing line
 (C) border line
 (D) deader line
48. In an engineering drawing sheet north direction (N) is towards the
 (A) left of the sheet
 (B) right of the drawing sheet
 (C) bottom of the sheet
 (D) top of the sheet
49. A well-composed drawing sheet, essential for technical drawings includes
 (A) a title block, drawing views
 (B) dimensions, notes
 (C) a drawing border
 (D) all of the above
50. Regulations established by local authorities to govern building construction and development within their jurisdictions is called
 (A) building by-laws
 (B) set back requirement for private buildings
 (C) rules of engineering quality construction
 (D) environment protection regulation
51. Primavera is a
 (A) scheduling software
 (B) cost controlling software
 (C) project communication software
 (D) all of the above
52. Practicing engineers shall at all-times act as faithful agents in the interest of
 (A) Contractor
 (B) Employers or clients
 (C) Project Affected People (PAP)
 (D) Local politicians

Contd...

53. Strong and crucial client and contractor relationships is built on
(A) supremacy of client over contractor
(B) mutual respect and clear communication
(C) mutual understanding to reduce cost of construction
(D) freedom of contractor over specifications alteration
54. The tenure of office of members nominated or elected to the Nepal Council shall be
(A) 2 years (B) 3 years (C) 4 years (D) 5 years
55. Ethics is the science which deals with
(A) rightness of professional (B) wrong of professional
(C) both (A) and (B) (D) none of the above
56. The best way to ensure right angle while setting out small buildings is
(A) to use of 'A' shaped wooden try-square
(B) to use a method of 3-4-5
(C) to take equal offsets from a line and stretch a string joining the ends of the offsets.
(D) to make sure that the diagonals of each of the rectangles are equal
57. For setting the tangent in a simple curve setting out process, the most commonly used method for better accuracy is
(A) Rankine's method (B) Trial and error method
(C) Tacheometric method (D) Two theodolite method
58. In route surveys, the most suitable method of contouring is
(A) by radia lines (B) by tachometer (C) by squares (D) by cross-sections
59. If there are contours of different values intersecting, that means
(A) there is a vertical cliff (B) there is a sequence of alternate valleys and ridges
(C) there is a water-filled pond (D) there is an overhanging sloping rock
60. The discrepancy between the computed coordinates of the final point and the known coordinates of the starting point after measuring a closed loop of lines is called
(A) closing error (B) travers error (C) contour survey error (D) plane table survey error
61. Theodolite vertical circle is a circular graduated arc attached to the axis of the telescope.
(A) line of sight axis (B) trunnion axis (C) outer axis (D) inner axis
62. A surveying method where field observations and plotting are done simultaneously is
(A) chain survey (B) theodolite survey (C) plane table survey (D) astronomical survey
63. In plane table surveying, "Back Ray Method" is one of the ways to be followed in
(A) radiation method (B) traversing method (C) resection method (D) intersection method
64. Which of the following is false in the context of survey by an altimeter?
(A) The survey follows a method of barometric levelling
(B) The survey falls under the class of check levelling
(C) The survey is very rough in terms of accuracy
(D) The survey is useful for hikers
65. Levelling deals with measurements in a
(A) horizontal plane (B) inclined plane (C) vertical plane (D) both (A) and (C)

Contd...

66. The reason for trilateration taking place of triangulation lately is
 (A) advent of EDMs, etc.
 (B) that it is after all a matter of accuracy
 (C) that one small inaccuracy in angular measurement makes a great difference
 (D) all of the above
67. Number of links in a 30 cm metric chain is
 (A) 100 (B) 150 (C) 180 (D) 200
68. In which of the following type of surveying only linear measurements are made?
 (A) Dumpy level (B) Theodolite surveying (C) Chain surveying (D) Contouring
69. The neutral axis shifts higher up towards the compression zone (top of the section) in
 (A) an over reinforced section (B) an under reinforced section
 (C) a balanced section (D) none of the above
70. When actual neutral axis lies below balanced neutral axis, it is said to be
 (A) under-reinforced section (B) balanced section (C) over-reinforced section (D) none of the above
71. Generally, reinforced section is designed in
 (A) under-reinforced section (B) balanced section (C) over-reinforced section (D) none of the above
72. The maximum bending moment due to a moving load of a simply supported beam occurs
 (A) at the mid span (B) at the supports (C) under the load (D) none of the above
73. The bending moment is maximum on a section where shear force
 (A) is maximum (B) is minimum (C) is equal (D) changes sign
74. Which of the following types of stones are used in ashlar masonry?
 (A) Dimension stones (B) Polygonal stones (C) Quarry dressed stones (D) Square stones
75. The minimum number of main bar in a circular column must be
 (A) 4 (B) 6 (C) 8 (D) 12

««The End»»

उत्तरपुस्तिकामा प्रश्नपत्रको Key अनिवार्य रूपले उल्लेख गर्नुपर्नेछ। Key उल्लेख नगरेमा उत्तरपुस्तिका रद्द हुनेछ।

लोक सेवा आयोग
नेपाल नागरिक उड्डयन प्राधिकरण, प्राविधिक, सिभिल इन्जिनियरिङ, सातौं, वरिष्ठ अधिकृत पदको
खुला प्रतियोगितात्मक लिखित परीक्षा
२०८२/०३/२३

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. Discuss the physical characteristics of the STOL port, its obstacles and limitations. 5
2. Introduce the Convention on International Civil Aviation, also known as the Chicago Convention. 5
3. Unlike in Working Stress Method, discuss how a different kind of approach is adopted while using safety factors to take care of uncertainty in material strength and load in the case of Limit State Design of RC structure. Explaining under-reinforced and over-reinforced RC sections, clarify how and why an over-reinforced section is not advisable to provide. 6+2+2=10
4. What are the factors that govern the size of the Apron-Gate position in an airport? Also, sketch different basic aircraft parking configurations and discuss advantages and disadvantages of each of them. 4+6=10
5. Elaborate the different elements of airport planning. Explain the 'Centralized' and 'Decentralized' concept of Terminal Building Planning with their salient features. 6+4=10
6. For the purpose of identifying standards for various sizes of airports and the functions they serve, reference codes have been developed by ICAO. Elaborate Aerodrome Reference Code as per ICAO Annex 14. 10

Section "B"

50 Marks

7. What is understood by Float in the Critical Path Method (CPM)? Explain with examples. 5
8. Explain the basic tests for coarse aggregate material to ensure its suitability to use in base course of airport pavement. 5
9. Differentiate between soil compaction and consolidation. Explain how each of these processes affects the structure. 5+5=10
10. Explain the design considerations for airport drainage systems, including the determination of the design storm and layout of surface and subsurface drainage. 6+4=10
11. What is pavement management system? Explain different types of distress in bituminous pavement of an airport. 3+7=10
12. What is method of resection in the context of plane table surveying? Can you correlate resection with working of GPS? Also, explain Reciprocal Levelling and different orders of Benchmarks. 3+2+2+3=10

- The End -