

Nepal Engineering Council Registration Examination
Model Question for Civil and Rural Engineering (ACRE)

Section A (60*1 = 60)

1. Modulus of elasticity is the stress when applied in a member will double the length due to
 - a) change in length = original length
 - b) change in length = twice of original length
 - c) final length = original length
 - d) final length = half of original length
2. Profound lumps of cement in a bag shall be confirmed instantly before its use by
 - a) consistency test
 - b) soundness test
 - c) freshness test
 - d) setting time test
3. Non-load bearing (e.g. compound wall) is generally constructed using stones in
 - a) ashlar fashion
 - b) coursed rubble
 - c) uncoursed rubble
 - d) chamfered ashlar
4. A body will appear mirror image with respect to
 - a) elastic neutral axis
 - b) plastic neutral axis
 - c) axis of symmetry
 - d) neutral axis and axis of symmetry
5. If a topographic map is prepared with 5m contour interval, then index contour is generally shown at
 - a) every 5th contour
 - b) every 3rd contour
 - c) every 10th contour
 - d) every 7th contour
6. Valuation of a currently running Bhat Bhateni supermarket shall be carried out more precisely by..... methods of valuation
 - a) plinth area
 - b) capitalized worth

- c) depreciated
 - d) development
7. Which of the following property of soil is known for index property
- a) size of particle
 - b) shape of particle
 - c) thixotropy
 - d) shape and size of particle
8. Compaction and consolidation are different because of
- a) intensity of load applied
 - b) equipment used for loading purpose
 - c) expulsion of either air particle or water particle
 - d) either reduction of void ratio or increasing density of soil
9. A pure sand has its shear strength due to
- a) ϕ
 - b) C
 - c) C and ϕ
 - d) void ratio of sand
10. For construction of bridge pier, precise soil test shall be carried out by taking sample through
- a) digging a pit
 - b) direct shear test
 - c) sand piling
 - d) standard split spoon sample
11. Shallow foundation is different from deep foundation in many aspects, one of the prominent aspects is
- a) it has low depth
 - b) it has wider width
 - c) worker can enter purposefully
 - d) only used in building construction
12. One of the greatest merits of raft foundation is
- a) easier to construct than deep foundation
 - b) stronger than deep foundation
 - c) avoids unequal settlements
 - d) avoids unnecessary costs for soil tests

13. A liquid of specific gravity 0.8 is heavier than water by -----
- a) 1.0
 - b) 0.8 m
 - c) 0.4 m
 - d) 1.6 m
14. Working principle of hydraulic lift is based on
- a) Bernoulli's principle
 - b) Archimedes' principle
 - c) Pascal's Law
 - d) Newton's Law
15. Bernoulli's equation is derived from
- a) Kepler
 - b) Laplace
 - c) Euler
 - d) Poisson
16. Moody's diagram for estimating head loss was originally developed for
- a) Circular pipes
 - b) Rectangular pipes
 - c) Trapezoidal pipes
 - d) Semi-circular pipes
17. If the flow parameters remain constant at any section along the flow at a particular instant of time, then flow is known as flow
- a) steady
 - b) unsteady
 - c) uniform
 - d) nonuniform
18. The instrument used for measuring evaporation is
- a) hygrometer
 - b) evaporimeter
 - c) lysimeter
 - d) luxmeter
19. A vertical sleeve support can have number of induced reactions
- a) 1
 - b) 2

- c) 3
 - d) 4
20. Torque required to be applied in a shaft with increased length will be for the same amount of twist
- a) increased
 - b) decreased
 - c) constant
 - d) doubled
21. According to Euler's theory, the critical load is
- a) directly proportional to flexural rigidity
 - b) inversely proportional to flexural rigidity
 - c) inversely proportional to length of column
 - d) directly proportional to square of length of column
22. Which of the following method is best suited to calculate the slope at supports of simply supported beam (SSB) loaded with central concentrated load
- a) real work method
 - b) strain energy method
 - c) slope deflection method
 - d) unit load method
23. For the influence line diagram (ILD) drawn for shear force at any section ('a' unit far from left support) in a simply supported beam of 'L' span, the ratio of maximum positive ordinate to maximum negative ordinate will be
- a) $(a/L) - 1$
 - b) $(L/a) + 1$
 - c) $(a/L) + 1$
 - d) $(L/a) - 1$
24. In Muller Breslau principle, the deflection shape of structure due to applied unit force resembles the shape of influence line diagram in some scale, the scale factor is
- a) amount of deflection at any point along deflected curve
 - b) amount of deformation which was intentionally created
 - c) amount of slope at any point along deflected curve
 - d) amount of shear force at any point along the conjugate beam
25. Load combinations are the loadings formed by the of the independent loading conditions.
- a) Linear combination

- b) Non-linear combination
 - c) Exponential functions
 - d) Binary functions
26. Slump test of concrete is conducted to determine the
- a) Strength
 - b) Workability
 - c) Soundness
 - d) Durability
27. Which of the following statement is the most appropriate?
- a) beam is designed in compression and checked for shear
 - b) beam is designed in shear and checked for bending
 - c) beam is designed for bending and checked for shear
 - d) beam is designed for bending and checked for torsion
28. According to IS 456:2000, $E_c = 500\sqrt{f_{ck}}$, where E_c represents
- a) long term static modulus of elasticity of concrete in N/mm^2
 - b) short term static modulus of elasticity of concrete in KN/m^2
 - c) short term static modulus of elasticity of concrete in N/mm^2
 - d) long term static modulus of elasticity of concrete in KN/m^2
29. Which of the following members can resist axial compression?
- a) strut
 - b) tie
 - c) beam
 - d) cable
30. According to national building code (NBC) 202:2015, maximum unsupported length of long wall between cross walls shall be limited to
- a) 4.0 m
 - b) 4.5 m
 - c) 5.0 m
 - d) 5.5 m
31. The impermeable layer of soil below the ground that neither contain nor transmit water is called as
- a) aquifer
 - b) aquiclude
 - c) aquifuge

- d) aquitard
32. In Nepal, water supply pipes of a pumping system of water distribution network are generally designed for a velocity not exceeding to
- a) 0.6 m/s
 - b) 1.5 m/s
 - c) 4.5 m/s
 - d) 3 m/s
33. Rate of filtration in terms of lph/m² for a rapid sand filter lies in between
- a) 3000 to 6000
 - b) 2000 to 6000
 - c) 6000 to 15000
 - d) 100 to 200
34. Design discharge of lateral sewers in Nepal are taken as times average discharges.
- a) 1.8
 - b) 2 to 4
 - c) 2 to 5
 - d) 1.4
35. The sludge produced in an activated sludge process is considered as an average sludge when the sludge volume index (SVI) is
- a) 50 to 100 ml/g
 - b) 100 to 200 ml/g
 - c) 50 – 100 g/ml
 - d) > 200 ml/g
36. According to Environment Protection Act (EPA), 2019 of Nepal, which of the following Environmental Assessment (EA) processes mandatorily requires scoping document.
- a) BES and IEE
 - b) IEE and EIA
 - c) EIA
 - d) BES
37. Which of the following type of irrigation method uses artificial rain-like system to irrigate the land?
- a) sprinkler irrigation method
 - b) furrow irrigation method
 - c) drip irrigation method

- d) border irrigation method
38. When the canal bed level lies between the bed level and HFL of the drain, the structure provided is known as
- a) Syphon aqueduct
 - b) Super Passage
 - c) Aqueduct
 - d) Syphon
39. The path represented by the streamlines is called as -
- a) energy dissipation
 - b) flow net
 - c) water flow
 - d) hydraulic jump
40. At which stage most sediment deposition occurs in a river?
- a) through stage
 - b) boulder stage
 - c) alluvial stage
 - d) delta stage
41. Pelton turbines are used for
- a) medium head application
 - b) low head applications
 - c) in steam power plant
 - d) high head application
42. Which principle is used in Hydraulic Turbines?
- a) Braggs law
 - b) Pascal's Law
 - c) Faraday Law
 - d) Newton's second law
43. The design capacity of a village road in Terai in both direction (Vehicle per day/PCU per day) is
- a) 800
 - b) 200
 - c) 300
 - d) 600
44. In general, windguy arrangement is not required for trail bridges with span up to
- a) 120m

- b) 150m
 - c) 200m
 - d) 50m
45. The approximate storage temperature of fish is
- a) -25°C
 - b) -35°C
 - c) -15°C
 - d) 5°C
46. The structure used traditionally to harvest rain water in rural area is called
- a) Tubewell
 - b) Stepwell
 - c) Borewell
 - d) Handpump
47. In biomethane, the percentage of carbon dioxide is
- a) 55-60%
 - b) 32-43%
 - c) 35-45%
 - d) 30-40%
48. Structures used for restraining animal when carrying out livestock routine practices like spraying and milking is called as
- a) Crushes
 - b) Dips
 - c) Poultry House
 - d) Dairy shed
49. The roads with average daily traffic (ADT) of 5000 to 20000 passenger car unit (PCU) in 20 years perspective periods are called as
- a) class I roads
 - b) class II roads
 - c) class III roads
 - d) class IV roads
50. As per Nepal Road Standards (NRS 2070), the cross slope of a Water Bound Macadam (WBM) road should be considered as
- a) 5.0%
 - b) 2.5%
 - c) 4.0%
 - d) 1.5 to 2.0%

51. The viscosity of a bitumen sample is expressed in
- a) psi
 - b) dynes
 - c) mm^2/sec
 - d) sec
52. The definite peak value of speed across the section from the frequency distribution curve provides
- a) modal speed
 - b) mean speed
 - c) speed for regulation
 - d) spot speed
53. Standard axel load of a vehicle in Nepal is considered as
- a) 102 KN
 - b) 101.7 KN
 - c) 81.6 KN
 - d) 82 KN
54. Which of the following joint is not a road joint?
- a) tyton
 - b) expansion
 - c) construction
 - d) warping
55. Standard dimensions (mm x mm) of A3 drawing sheet is
- a) 11.69×16.54
 - b) 29.7×42
 - c) 297×420
 - d) 420×280
56. Which of the following methods of charging depreciation of an asset has increased amount of depreciation as the age of asset increases
- a) sum-of-year digit
 - b) sinking fund
 - c) diminishing balance
 - d) straight line
57. The process of optimizing the project's limited resources without extending the project duration is known as

- a) project crashing
 - b) resource levelling
 - c) resource smoothing
 - d) networking
58. The process of composing/raising the required fund from different sources such as equity, preferred stock, bond and debenture is known as
- a) capital structure planning
 - b) project financing
 - c) capital budgeting decision
 - d) deducing earning per share
59. In which of the following society, people used to seek their existence on growing plants for their cattle and domestic animals
- a) pastoral society
 - b) tribal society
 - c) horticultural society
 - d) agricultural society
60. According to Nepal Engineering Council Act, 2055 (Revised, 2079), all engineering academic institutions shall be in the Council.
- a) affiliated
 - b) united
 - c) recognized
 - d) associated

Section-B (20*2 = 40)

61. The reduced bearing (RB) of a whole circle bearing (WCB) 160° is
- a) 30° N
 - b) 20° SE
 - c) 20° SW
 - d) 45° NW
62. Two right angles (constructed by 3-4-5 rule) forming a single triangle (in first quadrant of reference frame) would have its center of gravity (CG)
- a) 3,3
 - b) $2,4/3$
 - c) $3,4/3$

- d) 2, 3
63. A pycnometer containing 400gm sand and water full to the top is 2150gm. If the clear water plus pycnometer weight is 1950gm and specific gravity of soil sample is 2.5, the water content of the sample is
- 15%
 - 20%
 - 25%
 - 10%
64. If a coarse-grained soil has $e = 0.75$, $s = 2.75$, the critical gradient at which quick sand condition occurs, is
- 0.25
 - 1.00
 - 0.50
 - 0.75
65. The pressure of water in a pipe when water is not flowing is 3×10^5 Pa and when the water flows the pressure falls to 2.5×10^5 Pa. The velocity of flow in m/sec is
- 1
 - 10
 - 5
 - 20
66. If the depth of a trapezoidal section is 2m, base width is 3m, side slope is 1H:2V, and bed slope is 1 in 1000, Manning coefficient 'n' of the section will be -----
- 0.012
 - 0.013
 - 0.014
 - 0.015
67. The plastic moment capacity of a simply supported beam (SSB) having 'L' span subjected to a point load at mid span is -----
- $WL/2$
 - $WL/4$
 - $WL/8$
 - $WL/16$
68. A 50 m span three hinged parabolic arch having 4m central rise, if subjected to 20KN/m uniformly distributed load (UDL) over half of the span, H-moment produced at a distance of 10 m is -----
- 2000

- b) 3000
 - c) 4000
 - d) 5000
69. As per Indian Standard (IS) 456: 2000, the minimum area of tension reinforcement in a beam when Fe 415 steel is used,
- a) 0.02%
 - b) 0.20%
 - c) 0.085%
 - d) 0.85%
70. In order to account the shear deformation effects, the effective slenderness ratio of laced columns shall be taken as time(s) the actual maximum slenderness ratio
- a) 0.50
 - b) 1.05
 - c) 1.00
 - d) 1.10
71. An estimated fire demand of the city with a population of 120,000 based on widely used Indian Water Supply Manual (1976) formula is -----
- a) 760 lit/min
 - b) 760 m³/d
 - c) 1096 lit/min
 - d) 1096 lit/hr
72. A sewage sample of 3 ml diluted with distilled water in a 300 ml capacity biological oxygen demand (BOD) bottle is incubated at 20°C for 5 days and the depletion of dissolved oxygen (DO) was 10 mg/l. Then, the initial BOD of the sample is
- a) 146.30 mg/l
 - b) 1.463 mg/l
 - c) 1463 mg/l
 - d) 14.63 mg/l
73. Lacey's scour depth for a stream carrying a discharge of 3 cumecs per meter width having a silt factor 1.2 is -----
- a) 3.96 m
 - b) 2.64 m
 - c) 4.32 m
 - d) 1.32 m
74. Consider the following statement about Bligh's Creep Theory.

- i) Creep length is the length of path traversed by percolating water
- ii) To increase the path of percolation vertical cut-off or sheet piles can be provided
- iii) Loss of head per unit creep length is hydraulic gradient
- iv) Bligh gave no criteria for the safety of weir against undermining

Which of the following statement are correct?

- a) i, ii, iii
 - b) ii, iii, iv
 - c) i, iii, iv
 - d) i, ii, iv
75. A settling basin is expected to remove solids greater than 0.008mm from a maximum inflow of $0.25\text{m}^3/\text{sec}$. Particles of the minimum size settle at $V_s = 5.9 \times 10^{-5} \text{ m/sec}$. The necessary area for a 1m deep basin is
- a) 4237 sqm
 - b) 2492 sqm
 - c) 9242 sqm
 - d) 3724 sqm
76. What is the volume of settling of sewage to design a septic tank for a house of 10 person and rate of sewage generation is 100lpcd?
- a) 10.00 Cum
 - b) 50.00 Cum
 - c) 5.00 Cum
 - d) 30.00 Cum
77. Assuming the coefficient of friction of 0.36 and the total reaction time of a driver as 2.5 sec, the stopping sight distance for a design speed of 65 kmph is
- a) 55.25 m
 - b) 46.21 m
 - c) 4.62 m
 - d) 91.4 m
78. Los Angeles Abrasion test was conducted in standard manner for the aggregate sample of 8 kg and the weight of aggregate retained on 1.7 mm sieve was found to be 6.2 kg. Then, the Los Angeles abrasion value of the aggregate is -----
- a) 22.5%
 - b) 77.5%
 - c) 0.775 kg
 - d) 0.225 kg
79. Effective monthly interest rate will be, if nominal interest rate of 10% accounted for continuous compounding
- a) 1%

b) 0.84%

c) 1.2%

d) 2%

80. By considering following activities of a project, the project duration will be

Activity	A	B	C	D	E
Immediate predecessors	-	-	-	C	A, B, D
Duration (days)	4	5	3	7	5

a) 9 days

b) 10 days

c) 15 days

d) 24 days