

**Nepal Engineering Council Registration Examination**  
**Model Question for Environmental Engineering (ACiE)**

**(100\*1 = 100)**

1. The first law of thermodynamics states that energy can never be created nor be destroyed. It means .....
  - a) Change in energy of system > change in energy of surroundings
  - b) Change in energy of system – change in energy of surroundings > 0
  - c) Change in energy of system – change in energy of surroundings < 0
  - d) Change in energy of system – change in energy of surroundings = 0
  
2. The baseline study in EIA refers to .....
  - a) Collection of demographic data
  - b) Prediction of significant residual environmental impact
  - c) Existing environmental settling of the proposed development area
  - d) Selection of best project option available
  
3. Particularly in geodetic survey, the surface of earth is considered as .....
  - a) Vertical
  - b) Horizontal
  - c) Inclined
  - d) Curved
  
4. What is the purpose of a product life cycle assessment (LCA)?
  - a) To measure the environmental impact of a product
  - b) To identify potential risks associated with a product
  - c) To improve the quality of a product
  - d) To increase the lifespan of a product
  
5. Valuation of a currently running Bhat Bhateni super market shall be carried out more precisely by..... methods of valuation
  - a) plinth area
  - b) capitalized worth
  - c) depreciated
  - d) development
  
6. Which of the following attribute is not associated with digital maps?
  - a) Color
  - b) Legend
  - c) South arrow
  - d) Symbolology

7. 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
8. Working principle of hydraulic lift is based on .....
- a) Bernoulli's principle
  - b) Archimedes' principle
  - c) Pascal's Law
  - d) Newton's Law
9. Bernoulli's equation is derived from .....
- a) Kepler
  - b) Laplace
  - c) Euler
  - d) Poisson
10. Moody's diagram for estimating head loss was originally developed for .....
- a) Circular pipes
  - b) Rectangular pipes
  - c) Trapezoidal pipes
  - d) Semi-circular pipes
11. 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
12. The instrument used for measuring evaporation is .....
- a) hygrometer
  - b) evaporimeter
  - c) lysimeter
  - d) luxmeter

13. A vertical sleeve support can have..... number of induced reactions
- a) 1
  - b) 2
  - c) 3
  - d) 4
14. 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
15. 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
16. The unit of deflection is .....
- a) kN/m
  - b) m
  - c) kN
  - d) kNm
17. Poisson's ratio for concrete .....
- a) Increases with richer mixes
  - b) Decreases with richer mixes
  - c) Increases with poor mixes
  - d) Decreases with poor mixes
18. The main ingredients of Portland cement are .....
- a) Lime and Silica
  - b) Lime and alumina
  - c) Silica and alumina
  - d) Lime and Iron
19. The fractures along which there has been relative movement of the blocks is called....
- a) Fold

- b) Joint
  - c) Fault
  - d) Overhanging
20. Atmospheric humidity is measured by .....
- a) Auxanometer
  - b) Photometer
  - c) Hygrometer
  - d) Barometer
21. The process working for removal of CO<sub>2</sub> from earth's atmosphere is ....
- a) Lighting
  - b) Fossil fuel burning
  - c) Photosynthesis
  - d) Deforestation
22. Which of the following example is the reinforce function of bioengineering?
- a) Soil nailing
  - b) Turfing
  - c) Concete jacketing
  - d) Crib walls
23. A locally made geotextile is of .....
- a) GI wire
  - b) Jute
  - c) Plastic
  - d) Straw
24. Optimum temperature conditions in bioremediation for degradation of contaminants are
- a) 5–20° C
  - b) 20–30° C
  - c) 40–45° C
  - d) 45–50° C
25. The major objective of water supply scheme is .....
- a) Treatment of water
  - b) Ionization of water
  - c) Supply safe and reliable water
  - d) Laying pipelines and infrastructures
26. What should be the concentration of residual chlorine after 30 minutes contact time at pH less than 8?
- a) 0.5 mg/L

- b) 5 mg/L
  - c) 250 mg/L
  - d) 500 mg/L
27. Which valve is used to prevent flow in wrong direction?
- a) Butterfly valve
  - b) Gate valve
  - c) Floating valve
  - d) Check valve
28. Activated carbon is used in water treatment for .....
- a) disinfection
  - b) removing hardness
  - c) removing odour
  - d) aeration
29. Which of these is not a component of Non-Revenue water (NRW)?
- a) Billed unmetered consumption
  - b) Unbilled metered consumption
  - c) Overflow at utility's storage tanks
  - d) Customer metering inaccuracies
30. What are the pumps that operate by alternately filling a cavity and then displacing a given volume of liquid called?
- a) Roto-dynamic pumps
  - b) Positive displacement pumps
  - c) Rotating pumps
  - d) Centrifugal pumps
31. Which one are the conventional energy sources?
- a) Nuclear Energy
  - b) Hydropower
  - c) Wind
  - d) Biomass
32. Which one of the following are not the Mechanical components of Hydropower?
- a) Penstock
  - b) Governor
  - c) Conduct
  - d) Expansion Joints
33. Which one of the following is not the factors affecting power of solar cells?
- a) Voltage
  - b) Current
  - c) Efficiency

- d) Area
34. What are used to turn wind energy into electrical energy?
- a) Blades
  - b) Turbine
  - c) Yaw motor
  - d) Generators
35. What is the largest biomass energy to date?
- a) Wood
  - b) Fuel
  - c) Rocks
  - d) Marble
- 36..... emits from lightning, soil bacteria, high temperature fuel combustion and results acid rain and primary pollutants that produces photochemical smog.
- a) Sulphur dioxide
  - b) Particulate Matter
  - c) Nitrous oxide
  - d) Ozone
37. The term 'Municipal Solid Waste' refers to .....
- a) Hazardous
  - b) Toxic
  - c) Non-hazardous
  - d) Non-toxic
38. Field capacity of the solid waste represents the .....
- a) the ability to allow water/liquid to pass through it
  - b) the capacity to retain moisture against gravity
  - c) the area it occupies in the field
  - d) the ability to compress due to application of pressure
39. The method in which container is emptied to collection vehicle at the site is called...
- a) Stationary Container System
  - b) Hauled container system
  - c) Hoist truck system
  - d) Tilt-frame container system
40. What is the main difference between a sanitary landfill and an industrial landfill?
- a) The type of waste accepted
  - b) The size of the landfill
  - c) The location of the landfill
  - d) The method of waste disposal

41. In which of the following recycling, maximum energy is saved?
- a) Steel
  - b) Aluminium cans
  - c) cardboard
  - d) Paper
42. Which of the following is an essential component of an effective solid waste management policy?
- a) Landfill expansion
  - b) Control incineration of all waste
  - c) Recycling and waste reduction programs
  - d) Provision of high rate of fine
43. What range of air quality index (AQI) has the most severe impact on human health?
- a) 401 to 500
  - b) 301 to 400
  - c) 201 to 300
  - d) 101 to 200
44. A scrubber in the exhaust of a chemical industrial plant removes.....
- a) Ozone and Methane
  - b) Particulate matter above 5 micron
  - c) Sulphur dioxide
  - d) Particulate matter of the size 2.5 micron
45. Which of the following is not a criteria pollutant?
- a) CH<sub>4</sub>
  - b) NO<sub>x</sub>
  - c) TSP
  - d) O<sub>3</sub>
46. Which impactor is kept in High Volume Air Sampler for the analysis of PM<sub>2.5</sub>?
- a) Cascade impactor
  - b) Cyclone separator
  - c) Virtual impactor
  - d) WINS impactor
47. Which gas is mainly produced due to incomplete burning of wood?
- a) CO
  - b) SO<sub>2</sub>

- c)  $\text{NO}_2$
  - d)  $\text{NO}_3$
48. The best option to control noise pollution in the road are
- a) Use ear plug
  - b) Planting trees along the road
  - c) Shut the vehicle door
  - d) No horn regulations implementation
49. The means of access for inspection and cleaning sewer line is known as.....
- a) Manhole
  - b) Catch basin
  - c) Inlet
  - d) Cover
50. Which of the following sewer collects the discharge from collecting system and delivers it to a treatment plant?
- a) Branch Sewer
  - b) Outfall sewer
  - c) House sewer
  - d) Lateral sewer
51. When alum is added to the waste water containing calcium ions which compound is formed as a precipitate?
- a)  $\text{Al}_2(\text{SO}_4)_3$
  - b)  $\text{CaCO}_3$
  - c)  $\text{Al}(\text{OH})_3$
  - d)  $\text{Ca}(\text{OH})_2$
52. Which of the following pumps is used to pump sewage solids with liquid sewage without clogging?
- a) Centrifugal pump.
  - b) Pneumatic pump.
  - c) Reciprocating pump
  - d) Submersible
53. The type of wastewater treatment process for treating wastewater using aeration and biological floc is called....
- a) Activated sludge process

- b) Aeration
  - c) Biological Digestion
  - d) Anaerobic digestion
54. What is the final water content of sludge after dewatering?
- a) 5%
  - b) 2%
  - c) 10%
  - d) 1%
55. Standard dimensions (mm x mm) of A3 drawing sheet is
- a)  $11.69 \times 16.54$
  - b)  $29.7 \times 42$
  - c)  $297 \times 420$
  - d)  $420 \times 280$
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
- pastoral society
  - tribal society
  - horticultural society
  - agricultural society
60. According to Nepal Engineering Council Act, 2055 (Revised, 2079), all engineering academic institutions shall be .....in the Council.
- affiliated
  - united
  - recognized
  - associated
61. The mass balance equation for non-steady state non-conservative system is \_\_\_\_\_.  
[Option]
- Accumulation = Input + Output
  - Input = Output
  - Input = Output + KCV
  - Accumulation = Input + Output + G - KCV
62. Which type of property does not depend on the amount of matter present?  
[Option]
- Extensive properties
  - Intensive properties
  - Physical properties
  - Chemical properties
63. Identify the correct sequence with reference to EIA approval process for new projects.  
[Option]
- Appraisal--Scoping-Public consultation
  - Scoping- Public consultation –Appraisal
  - Scoping - Public consultation –Appraisal
  - Public consultation –Appraisal- Scoping
64. In Life Cycle Assessment (LCA) comparing anaerobic digestion and composting for municipal solid waste management, which functional unit would be most relevant?  
[Option]
- Kilograms of waste converted to biogas or compost
  - Time taken to process the waste (in hours)
  - Total cost of the process per month
  - Energy consumption of 100 kWh per day

65. If a road is 10 km long and 10 m wide, and it passes through a forest area between chainage 2+000 to 3+500 and 7+000 to 8+500, the approximate area of forest land required is \_\_\_\_ ha.  
[Option]  
a) 30  
b) 15  
c) 6  
d) 3
66. The purpose of clip function in GIS is \_\_\_\_\_.  
[Option]  
a) Merge two layers  
b) Remove unwanted pixels  
c) Extract data within boundary  
d) Add a Buffer
67. A fluid which has shear stress is proportional to the rate of shear strain is called \_\_\_\_ fluid.  
[Option]  
a) Ideal  
b) Ideal Plastic  
c) Non Newtonian  
d) Real
68. An open tank contains 1 m deep water with 50 cm depth of oil of specific gravity 0.8 above it. The intensity of pressure at the bottom of the tank is \_\_\_\_\_ kN/m<sup>2</sup>. Take  $g = 10 \text{ m/s}^2$  for ease in calculation.  
[Option]  
a) 4  
b) 10  
c) 12  
d) 14
69. In flood frequency analysis, the return period (T) of a flood represents \_\_\_\_\_.  
[Option]  
a) The number of years between two identical floods  
b) The expected average interval between floods equal to or greater than a given magnitude  
c) The total number of floods in a specific time  
d) The time it takes for floodwaters to recede
70. The velocity of fluid particle at the centre of the pipe section is \_\_\_\_\_.  
[Option]  
a) Maximum  
b) Minimum  
c) Average  
d) Zero

71. The water balance equation for a catchment is generally expressed as\_\_\_\_\_.

[Option]

- a)  $P = Q + G + E$
- b)  $P = R - E - \Delta S$
- c)  $P + E = R + \Delta S$
- d)  $P - (R + E + \Delta S) = 0$

72. What natural feature separates one catchment area from another?

[Option]

- a) Valley
- b) River
- c) Ridge
- d) Basin

73. Between two points where the shear force is zero, the bending moment will be \_\_\_\_.

[Option]

- a) Tensile and acts away from the section
- b) Compressive and acts away from the section
- c) Compressive and acts toward the section
- d) Zero throughout

74. In pure bending, which of the following statements is true?

[Option]

- a) The bending moment and shear force are both constant along the beam
- b) The bending moment is constant, and shear force is zero.
- c) The shear force is constant, and bending moment is zero.
- d) Both bending moment and shear force vary linearly.

75. For a three-hinged arch, the structure is

[Option]

- a) Indeterminate to the first degree
- b) Indeterminate to the second degree
- c) Perfectly determinate
- d) Kinetically unstable

76. In a T-beam, the effective flange width depends primarily on:

[Option]

- a) Depth of neutral axis and grade of concrete
- b) Span length, web width, and slab thickness
- c) Type of loading only
- d) Reinforcement percentage

77. The main objective of structural design as per NS and IS codes is to ensure

[Option]

- a) Minimum use of reinforcement
- b) Aesthetic appearance
- c) Economy and speed of construction
- d) Adequate safety and serviceability under expected load

78. A meandering river is characterized by \_\_\_\_\_.  
[Option]  
a) Straight channels with uniform flow  
b) Multiple braided channels with high sediment load  
c) Single sinuous channel with pronounced bends  
d) Underground flow through porous rock
79. A GLOF (Glacial Lake Outburst Flood) is caused primarily by \_\_\_\_\_.  
[Option]  
a) Sudden release of water due to failure of a moraine dam or ice dam  
b) Excessive rainfall in mountain regions  
c) Seepage from melting permafrost  
d) Collapse of underground caves
80. The westerlies in the Northern Hemisphere blow from:  
[Option]  
a) Southeast to northwest  
b) Southwest to northeast  
c) Northeast to southwest  
d) Northwest to southeast
81. Risk in disaster studies is best defined as \_\_\_\_\_.  
[Option]  
a) The magnitude of a hazard only  
b) The potential loss divided by resilience  
c) The combination of hazard, exposure, and vulnerability  
d) The occurrence of any hazard event
82. Which of the following is an example of a climatic extreme event ?  
[Option]  
a) Volcanic eruption  
b) Heat wave  
c) Earthquake  
d) Tsunami
83. The increase in shear strength of soil due to plant roots depends mainly on \_\_\_\_\_.  
[Option]  
a) Root tensile strength and root density  
b) Canopy height and rainfall  
c) Stem thickness and trunk diameter  
d) Leaf area and color
84. Vegetation helps in slope stabilization mainly by \_\_\_\_\_.  
[Option]  
a) Increasing surface runoff  
b) Reducing infiltration and root cohesion  
c) Weakening the slope with organic matter

- d) Binding soil particles and intercepting rainfall?
85. Which of the following pollutants is most suitable for microbial bioremediation?  
[Option]
- a) Heavy metals like lead and mercury
  - b) Organic compounds such as petroleum hydrocarbons
  - c) Radioactive isotopes
  - d) Plastic polymers like polyethylene
86. Which group of microorganisms is most commonly involved in biodegradation of organic pollutants?  
[Option]
- a) Viruses
  - b) Fungi and bacteria
  - c) Protozoa
  - d) Algae
87. Which of the following is a small civil structure commonly used in bioengineering works?  
[Option]
- a) Masonry retaining wall
  - b) Concrete bridge pier
  - c) Check dam made of gabions or dry stone
  - d) Steel reinforcement cage
88. The purpose of a break pressure tank in a water supply system is to  
[Option]
- a) Store treated water for domestic use
  - b) Filter suspended particles
  - c) Increase the pressure in the distribution system
  - d) Reduce excessive pressure due to large elevation differences
89. ?In a water distribution network, excessive head loss results in  
[Option]
- a) Increased water velocity and leakage
  - b) Reduced pressure at consumer taps
  - c) Improved pumping efficiency
  - d) Better sedimentation
90. The Hardy Cross method is used for\_\_\_\_\_.  
[Option]
- a) Estimating population
  - b) Analyzing flow and head loss in looped water distribution networks
  - c) Calculating sedimentation rate
  - d) Designing treatment units
91. Non-Revenue Water (NRW)\_\_\_\_\_.  
[Option]
- a) Water supplied to commercial consumers

- b) Water produced but not billed due to losses or unauthorized use
  - c) Water used for fire-fighting only
  - d) Water from private wells
92. Which component of a hydropower plant carries water under pressure from the forebay to the turbine?  
[Option]
- a) Penstock
  - b) Tailrace
  - c) Intake
  - d) Spillway
93. The working principle of a solar cell is based on  
[Option]
- a) Photoelectric effect
  - b) Thermoelectric effect
  - c) Magnetostrictive effect
  - d) Electrolysis
94. Which property does not define a hazardous waste?  
[Option]
- a) Toxicity
  - b) Flammability
  - c) Corrosiveness
  - d) High moisture content
95. HCS (Household Collection System) differs from SCS (Secondary Collection System) in that\_\_\_\_\_.  
[Option]
- a) HCS collects waste directly from households; SCS collects from community bins
  - b) HCS involves landfill; SCS involves recycling
  - c) HCS is for hazardous waste; SCS is for municipal waste
  - d) HCS is only for industrial waste
96. In air pollution terminology, a “receptor” refers to\_\_\_\_\_.  
[Option]
- a) The pollutant source
  - b) The location where pollutants are measured or cause effects
  - c) The air pollution control device
  - d) The meteorological parameter
97. In isokinetic sampling of particulates, the sampling velocity is\_\_\_\_\_.  
[Option]
- a) Faster than stack gas velocity
  - b) Slower than stack gas velocity
  - c) Equal to the stack gas velocity
  - d) Irrelevant to particulate capture

98. Which sequence correctly represents primary, secondary, and tertiary treatment?

[Option]

- a) Sedimentation-Biological treatment- Filtration
- b) Chemical coagulation - Biological treatment - Sedimentation
- c) Sedimentation- Screening - Disinfection
- d) Sludge thickening -Screening - Aerobic treatment

99. Denitrification occurs under\_\_\_\_\_.

[Option]

- a) Aerobic conditions with high oxygen
- b) Anaerobic conditions with no nitrate
- c) Anoxic conditions with nitrate present as electron acceptor
- d) Acidic pH only

100. During project risk management, residual risk refers to?

[Option]

- a) Risks that are fully avoided after mitigation
- b) Risks that remain after mitigation measures are applied
- c) Risks identified but not analyzed
- d) Risks that occur unexpectedly after project completion

QN 8 Solution

Pressure at the bottom of the tank =

$$= \rho_1 g h_1 + \rho_2 g h_2$$

$$= 1000 \times 10 \times 1 + 0.8 \times 1000 \times 10 \times 0.5$$

$$= 10000 + 4000$$

$$= 14000 \text{ N/m}^2$$

$$= 14 \text{ kN}$$