Nepal Engineering Council Registration Examination

Model Question for Environmental Engineering (ACiE)

Section A (60*1 = 60)

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) Symbology

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 factures 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 CO2 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_4
    b) NO_x
    c) TSP
    d) O_3

46. Which impactor is kept in High Volume Air Sampler for the analysis of PM2.5?
    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_2

c) NO_2
d) 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) Al2 (SO4)3
    b) CaCO3
    c) Al(OH)3
    d) Ca(OH)2

52. Which of the following pumps in 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 × 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. Retention time of a lagoon has a volume of 1512 m^3, and the flow into the lagoon is 3 m^3/hr is …….

a) 189 days

b) 21 days

c) 504 days

d) 4536 days

62. Identify the correct sequence for EIA process of new project.

a) Appraisal-Screening-Scoping-Public hearing

b) Screening-Scoping-Public hearing- Appraisal

c) Scoping-Public hearing- Appraisal- Screening

d) Public hearing- Appraisal- Screening- Scoping

63. 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 ….

a) 1

b) 10

c) 5

d) 20

64. 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 --------
    a) 0.012
    b) 0.013
    c) 0.014
    d) 0.015

65. The plastic moment capacity of a simply supported beam (SSB) having ‘L’ span subjected to a point load at mid span is ---------
    a) WL/2
    b) WL/4
    c) WL/8
    d) WL/16

66. 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 ----------
    a) 2000
    b) 3000
    c) 4000
    d) 5000

67. Which of the following factors can have the greatest influence on the temperature of a place in equatorial latitudes?
    a) Aspect
    b) Altitude
    c) Distance from sea
    d) Vegetation cover

68. The maximum safe height of different types of retaining wall ranges from……
    a) 1 to 5 m
    b) Above 15 m
    c) 4 to 10 m
    d) up to 15 m l

69. If the annual average hourly demand of the city is 1000 cum, what is the maximum hourly consumption?
    a) 2.7 MLD

b) 27 MLD
c) 270 MLD
d) 2700 MLD

70. Calculate the area of a pipe with flow rate of 20 l/min and flow velocity of 5 cm/s.
    a) 66.7 sq. cm
    b) 4 sq. cm
    c) 240 sq. cm
    d) 6.7 sq. cm

71. What is the wind turbine power if blade length is 52 m, wind speed is 12m/sec and power coefficient is 0.4?
    a) 2 MW
    b) 2.6 MW
    c) 3 MW
    d) 3.6 MW

72. Which of the following statement of Kaplan turbine is true?
    a) Good efficiency range for full and part load condition and can be operated up to 20% load.
    b) Full load efficiency is good and part load efficiency is poor and not recommends operating below 50% load.
    c) Good efficiency range for full and part load condition and can be operated up to 30% load.
    d) Good efficiency range for full and part load condition and can be operated up to 25% load.

73. In Nepal, the density of compacted solid waste is taken as ….
    a) 780 kg/m^3
    b) 500 kg/m^3
    c) 350 kg/m^3
    d) 800 kg/m^3

74. In which method, the waste load is weighed and information is gathered about various forms of solid waste at a location?
    a) Proximate Analysis
    b) Material Balance Analysis
    c) Load Count Analysis
    d) Weight Volume Analysis

75. Which of the following does not have a direct role in climate change?
    a) Sulphate and nitrate aerosols

b) Black carbon aerosols
c) Surface ozone
d) Nitric oxide.

76. 2. The threshold limits of noise for Leq in decibel as prescribed by the National Standard of Noise 2069 for industrial area are ……..
    a) 75 in day and 70 at night
    b) 70 in day and 70 at night
    c) 65 in day and 60 at night
    d) 85 in day and 75 at night

77. The drainage area of a town is 12 ha. Its 40% area is hard pavement (c=0.85),40% area is unpaved (c=0.20) and rest is wooden area (k=0.15). Assuming the time of concentration for the areas as 30 mins and Intensity of rainfall is I = 900/(t+60), the maximum runoff is…
    a) 0.10 cu.m/s
    b) 0.12 cu.m/s
    c) 0.15 cu.m/s
    d) 0.20 cu.m/s

78. 2.High Value of BOD (Biological oxygen demand) indicates that …….
    a) Water is less polluted
    b) Consumption of organic matter in the water is higher by microbes
    c) Water is consumed in household activities
    d) Higher concentration of dissolved oxygen

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