

Nepal Engineering Council Registration Examination
Model Question for Mechanical Engineering (AMeE)

Section A (100*1 = 100)

1. Which is not the common type of fit in hole and shaft?
 - a) Clearance fit
 - b) Transference fit
 - c) Transition fit
 - d) Interference fit
2. Steel containing 0.15% - 0.45% carbon is called
 - a) Mild steel
 - b) Dead mild steel
 - c) Medium carbon steel
 - d) High carbon steel
3. Wrought iron contains of iron
 - a) 0.0999%
 - b) 0.999%
 - c) 9.99%
 - d) 99.9%
4. The C.G.S. unit of charge is
 - a) Coulomb
 - b) Erg
 - c) Franklin
 - d) Biot
5. The temperature of heat produced by the electric arc is of the order of
 - a) 6 °C – 7 °C
 - b) 60 °C – 70 °C
 - c) 600 °C – 700 °C
 - d) 6000 °C – 7000 °C
6. The type of organization preferred for a steel industry is
 - a) Line and staff
 - b) Functional
 - c) Line, staff and functional
 - d) Line
7. The measurement of a thermodynamic property ‘temperature’ is based on thermodynamic law
 - a) Zeroth law
 - b) First law
 - c) Second law

- d) Kelvin-plank law
8. Steady state flow application device is
- a) Filling-in of gas cylinder
 - b) Throttling valve
 - c) Filling-out of gas cylinder
 - d) Compressor
9. Entropy of water at 0° C is assumed to be
- a) 1
 - b) 0
 - c) -1
 - d) 10
10. Otto cycle is also known as
- a) Constant pressure cycle
 - b) Constant temperature cycle
 - c) Constant volume cycle
 - d) Constant enthalpy cycle
11. The inlet valve of a four-stroke cycle petrol engine remains open for
- a) 30°
 - b) 130°
 - c) 230°
 - d) 300
12. A refrigerant with the highest critical pressure is
- a) R-11
 - b) R-12
 - c) R-22
 - d) Ammonia
13. Water pressure at any point is measured with the unit
- a) Bar
 - b) Newton
 - c) Cusecs
 - d) kg
14. The upper surface of weir over which water flows is known as
- a) Crest
 - b) Nappe
 - c) Sill
 - d) Weir-top
15. Bernoulli's theorem deals with the conservation of
- a) Mass

- b) Force
 - c) Momentum
 - d) Energy
16. Which of the following pipe bends will introduce maximum head loss
- a) 30° bend
 - b) U bend
 - c) 45° bend
 - d) 90° bend
17. Most commonly used hydro turbine in Nepal is
- a) Pelton
 - b) Francis
 - c) Kaplan
 - d) Turgo-impulse
18. One horse power of pump is equal to
- a) 75 watt
 - b) 102 watt
 - c) 550 watt
 - d) 746 watt
19. The total momentum of a system of masses (*i.e.* moving bodies) in any direction remains constant, unless acted upon by an external force in that direction. This statement is called
- a) Newton's first law of motion
 - b) Newton's second law of motion
 - c) Principle of conservation of energy
 - d) Principle of conservation of momentum
20. Hook's law holds good up to
- a) Elastic limit
 - b) Yield point
 - c) Plastic limit
 - d) Breaking point
21. The unit of moment of inertia of an area is
- a) kg m^2
 - b) m^4
 - c) kg/m^2
 - d) kg/m^4
22. In a reciprocating steam engine, which of the following forms a kinematic link?
- a) Cylinder and piston
 - b) Piston rod and connecting rod
 - c) Crankshaft and flywheel

- d) Flywheel and engine frame
23. In simple harmonic motion (S.H.M.), the ratio of acceleration and displacement is proportional to
- a) ω
 - b) ω^2
 - c) $1/\omega^2$
 - d) $\sqrt{\omega}$
24. The distribution of torsion shear stress is uniform in section.
- a) Parallel
 - b) Rectangular
 - c) Trapezoidal
 - d) Circular
25. Casting process is preferred for parts having
- a) Many details
 - b) A few details
 - c) No details
 - d) Non-symmetrical shape
26. The heat treatment process used for softening hardened steel is
- a) Carburizing
 - b) Normalizing
 - c) Annealing
 - d) Tempering
27. Which of the following process is used to convert larger sections, such as ingots into smaller sections?
- a) Hot rolling
 - b) Hot forging
 - c) Squeezing
 - d) Hot extrusion
28. The process of improving the cutting action of the grinding wheel is called
- a) Truing
 - b) Dressing
 - c) Facing
 - d) Clearing
29. The commonly used flux for brazing is
- a) Resin
 - b) Soft iron
 - c) Borax
 - d) Soft silver

30. What is the full form of CNC in manufacturing?
- a) Computer Number Control
 - b) Computer Network Control
 - c) Computer Numerical Control
 - d) Computer Neural Control
31. ISO certification is needed for
- a) Quality control
 - b) Profit making
 - c) Formalities
 - d) Mass production
32. Which of the following component is not the mechanical power transmission system?
- a) Brakes
 - b) Gears
 - c) Belt
 - d) Shaft
33. The function of lubrication in mechanical system is
- a) Cooling
 - b) Increase wear and tear
 - c) Increase oxidation and corrosion
 - d) Heating
34. In a V-belt drive, belt touches
- a) At bottom
 - b) At sides only
 - c) At bottom and sides
 - d) Could touch anywhere
35. Which is not the basic type of vibration
- a) Longitudinal
 - b) Vertical
 - c) Transverse
 - d) Torsional
36. Which of these is not a characteristic of brainstorming?
- a) There is a time limit
 - b) Ideas are critically evaluated
 - c) Quantity of ideas is foremost
 - d) Creativity overrides practicality
37. A systematic approach for maintenance is
- a) Problem- cause-diagnosis -rectification
 - b) Problem-diagnosis -cause-rectification
 - c) Problem-measure-diagnosis-rectification

- d) Problem-diagnosis-measure-rectification
38. Which Act in Nepal covers more provisions regarding occupational safety and health?
- a) Labour Act
 - b) Electricity Act
 - c) Environment Act
 - d) Transport management Act
39. The following is not the classification of maintenance.
- a) Corrective maintenance
 - b) Timely maintenance
 - c) Condition monitoring
 - d) Scheduled maintenance
40. The reliability of the entire system is called_
- a) Partial reliability
 - b) Isolated reliability
 - c) Closed reliability
 - d) System reliability
41. What is the main objective of risk assessment?
- a) To evaluate hazard and minimize risks
 - b) Remediation of contaminated sites
 - c) Hazard management
 - d) To know source of pollutants
42. What does “NDT” stand for, in case of diagnosis of welding defects?
- a) Non-driving test
 - b) Non-destructive test
 - c) Non-dry test
 - d) Non-dial test
43. Which of the following can't fall under the head-controllable errors?
- a) Calibration errors
 - b) Environmental errors
 - c) Avoidable errors
 - d) Random errors
44. A device for determining the value or magnitude of a quantity or variable is called as
- a) Sensor
 - b) Transducer
 - c) Indicator
 - d) Instrument
45. Dynamometers are the devices that measures
- a) Displacement

- b) Pressure
 - c) Flow
 - d) Power
46. Which of the following industries should be located near the vicinity of raw materials?
- a) Cycles
 - b) Televisions
 - c) Sewing machines
 - d) Steel mills
47. In inventory control theory, the economic order quantity is
- a) Average level of inventory
 - b) Optimum lot size
 - c) Capacity of warehouse
 - d) Lot size corresponding to break-even analysis
48. The brake power is the power available
- a) In engine cylinder
 - b) At crank pin
 - c) At crank shaft
 - d) At connecting rod
49. The overall heat transfer coefficient is used in the problems of
- a) Conduction only
 - b) Convection only
 - c) Radiation only
 - d) Conduction and convection
50. The heat flow and temperature distribution throughout the fins is.....time.
- a) Independent of
 - b) Directly proportional to
 - c) Square proportional to
 - d) Inversely proportional to
51. Photovoltaic energy is the conversion of sunlight into
- a) Chemical energy
 - b) Biogas
 - c) Electricity
 - d) Geothermal energy
52. Which of the following is major exhaust emissions from Diesel Engine compared to Petrol Engine?
- a) Oxides of nitrogen
 - b) Particulates
 - c) CO and CO₂

- d) Unburnt hydrocarbon
53. Which of the following oil is more viscous?
- a) SAE 40
 - b) SAE 30
 - c) SAE 80
 - d) SAE70
54. Which of the following is called the secondary air pollutant?
- a) Ethylene
 - b) Ozone
 - c) Carbon monoxide
 - d) Nitrogen dioxide
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
61. Which of the following is *not* an effective method to control corrosion?
- a) Cathodic protection
 - b) Use of corrosion-resistant alloys
 - c) Application of protective coatings
 - d) Increasing humidity and temperature
62. Which of the following quantities represents the rate of flow of electric charge?
- a) Voltage
 - b) Current
 - c) Resistance
 - d) Power
63. In a shaper machine, the cutting action takes place during:
- a) The return stroke of the ram
 - b) Both forward and return strokes
 - c) The forward stroke of the ram
 - d) Only during tool setup
64. Motivation that comes from internal satisfaction, personal growth, or achievement is called:
- a) Extrinsic motivation
 - b) Intrinsic motivation
 - c) Coercive motivation
 - d) External reinforcement
65. The pitch of a screw thread is defined as:
- a) The distance between two consecutive crests or roots measured parallel to the axis
 - b) The angle between the flanks of the thread
 - c) The height of the thread from root to crest
 - d) The diameter at which the thread thickness equals the space between threads
66. A closed system in thermodynamics is one in which:
- a) Both mass and energy can cross the system boundary
 - b) Only mass can cross the system boundary
 - c) Only energy can cross the system boundary
 - d) Neither mass nor energy can cross the system boundary
67. The Clausius statement of the Second Law of Thermodynamics says that::
- a) No heat engine can be 100% efficient
 - b) Heat cannot of itself flow from a colder body to a hotter body
 - c) All reversible engines have equal efficiency
 - d) Energy can neither be created nor destroyed

68. The camshaft in an engine is responsible for:
- Controlling the timing of valve opening and closing
 - Driving the crankshaft
 - Maintaining engine temperature
 - Compressing the air–fuel mixture
69. Which of the following is a desirable property of a refrigerant?
- High boiling point and high toxicity
 - High latent heat of vaporization and non-corrosiveness
 - Low thermal conductivity and high density
 - High ozone depletion potential
70. A Newtonian fluid is one in which:
- Shear stress is independent of shear rate
 - Shear stress is directly proportional to the rate of shear strain
 - Viscosity changes with temperature and pressure abruptly
 - There is no viscous effect
71. The Continuity Equation for a steady, incompressible flow is based on the law of:
- Law of conservation of mass
 - Law of conservation of momentum
 - Law of conservation of energy
 - Newton's second law
72. The hydraulic efficiency of a turbine is defined as:
- Ratio of mechanical energy at the shaft to electrical output
 - Ratio of power developed by the runner to the energy supplied by water at the inlet
 - Ratio of input head to output head
 - Ratio of total head to net head
73. The performance curves of a pump show the relationship between:
- Head, discharge, and efficiency
 - Temperature, viscosity, and flow rate
 - Speed, torque, and power factor
 - Pressure, density, and temperature
74. For a body to be in static equilibrium, the following conditions must be satisfied:
- $\sum F=0$ and $\sum M=0$
 - $\sum F=0$ only
 - $\sum M=0$ only
 - $\sum F \neq 0$ and $\sum M=0$
75. Thermal stress is developed in a material when:
- The material is freely expanding or contracting with temperature
 - The temperature is constant throughout
 - Expansion or contraction due to temperature is restrained
 - The material is under pure shear stress
76. In a slider-crank mechanism, the link that transmits motion from the crank to the slider is called:
- Frame
 - Coupling rod

- c) Connecting rod
- d) Follower

77. Quenching is a process in which the heated metal is:

- a) Cooled slowly in the furnace
- b) Cooled rapidly in water, oil, or brine
- c) Heated again to a lower temperature
- d) Allowed to cool in air

78. In a milling machine, the cutting tool:

- a) Rotates while the workpiece remains stationary or moves linearly
- b) Remains stationary while the workpiece rotates
- c) Moves to and fro while the workpiece is fixed
- d) Cuts by grinding action

79. The major difference between soldering and brazing is that:

- a) Soldering uses a lower melting point filler metal than brazing
- b) Brazing is done at a lower temperature than soldering
- c) Soldering always requires flux, while brazing does not
- d) Brazing is used for electrical joints only

80. Additive manufacturing (3D printing) differs from conventional machining because it:

- a) Removes material to create parts
- b) Builds parts layer by layer by adding material
- c) Requires no digital model
- d) Uses only metallic materials

81. The main function of a clutch is to:

- a) Stop a rotating shaft instantly
- b) Connect and disconnect power between driving and driven shafts smoothly
- c) Transmit power continuously without control
- d) Increase torque output of an engine

82. In an undamped free vibration, the amplitude of vibration:

- a) Decreases gradually with time
- b) Increases exponentially with time
- c) Remains constant with time
- d) Becomes zero immediately after one cycle

83. A mechanical engineering standard helps designers by:

- a) Eliminating the need for material selection
- b) Providing reference dimensions, tolerances, and safety factors for common components
- c) Forcing all products to be identical
- d) Allowing arbitrary assumptions in design

84. Galvanic corrosion occurs when:

- a) Two similar metals are exposed to dry air
- b) Two dissimilar metals are in electrical contact in the presence of an electrolyte
- c) Metal is exposed to high temperature
- d) The paint coating is too thick

85. Total Productive Maintenance (TPM) aims to:
- Involve only the maintenance department in machine care
 - Achieve zero breakdowns and zero defects through operator participation
 - Focus only on production efficiency
 - Replace traditional preventive maintenance with breakdown repair
86. The need for maintenance arises mainly because of:
- Continuous wear and tear, corrosion, vibration, and aging of components
 - Overdesign and underuse of machinery
 - Perfect working conditions at all times
 - Frequent equipment upgrades
87. The Mean Time Between Failures (MTBF) of a system represents:
- The time taken to repair a component after failure
 - The total operating time divided by the number of failures
 - The maximum life span of a component
 - The downtime of a system
88. A qualitative risk analysis technique involves:
- Using numerical probability and statistical data only
 - Ranking risks based on expert judgment, experience, or categories like low/medium/high
 - Using Monte Carlo simulations
 - Deriving exact mathematical models of risk
89. In Dye Penetrant Testing (DPT), surface cracks are made visible by:
- Applying magnetic particles to the surface
 - Using a fluorescent or colored liquid that seeps into surface defects
 - Measuring electrical resistance
 - Using X-rays to highlight the defect
90. The least count of an instrument is defined as:
- The highest value that can be measured
 - The difference between two readings
 - The smallest value that can be measured accurately by the instrument
 - The ratio of error to accuracy
91. The Economic Order Quantity (EOQ) is the order quantity that:
- Minimizes total ordering and holding costs
 - Maximizes total inventory level
 - Minimizes purchasing cost only
 - Maximizes supplier discounts
92. Knocking in spark ignition (SI) engines is primarily caused by:
- Late combustion of the air–fuel mixture
 - Spontaneous auto-ignition of the end-gas ahead of the flame front
 - Use of high-octane fuel
 - Low compression ratio
93. Calibration of an instrument is done to:
- Adjust the instrument to read correctly within a specified accuracy range

- b) Increase the range of measurement
 - c) Make the instrument lighter
 - d) Eliminate the need for repeat measurements
94. The rate of heat transfer by conduction through a plane wall is given by:
- a) $Q = kA(T_1 - T_2)/L$
 - b) $Q = hA(T_1 - T_2)$
 - c) $Q = \sigma AT^4$
 - d) $Q = mc_p(T_1 - T_2)$
95. The primary purpose of using fins on a heated surface is to:
- a) Reduce heat transfer from the surface
 - b) Increase the heat transfer area and enhance the rate of heat dissipation
 - c) Store thermal energy for later use
 - d) Decrease the convective heat transfer coefficient
96. In a fuel cell, the chemical energy of fuel is converted directly into:
- a) Heat energy
 - b) Electrical energy
 - c) Mechanical energy
 - d) Sound energy
97. The viscosity grade of lubricating oil (e.g., SAE 20W-40) indicates:
- a) The ignition quality of fuel
 - b) The fuel economy of the engine
 - c) The flow characteristics of oil at low and high temperatures
 - d) The purity of the oil
98. The Internal Rate of Return (IRR) is:
- a) The interest rate at which the NPV of all cash flows equals zero
 - b) The rate of tax applied on income
 - c) The rate at which future cash flows are discounted for inflation
 - d) The fixed rate used by banks for all loans
99. An isometric projection is a type of pictorial drawing in which:
- a) All axes are at 45° to each other
 - b) Two axes are at 30° to the horizontal and one is vertical
 - c) Only one view is drawn without true dimensions
 - d) All dimensions are reduced by half
100. The Council (NEC) maintains a record of engineers under:
- a) Only one category for all engineers
 - b) Different categories based on qualifications and experience (e.g., Graduate Engineer, Professional Engineer)
 - c) Only foreign engineers working in Nepal
 - d) Only civil engineers working in public sector