

Nepal Engineering Council Registration Examination
Model Question for Automobile Engineering (AAmE)

Section A (60*1 = 60)

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. Energy released in actual cycle is about _____ of the fuel input.
- a. 90%
 - b. 70%
 - c. 50%
 - d. 25%
26. Which is the third port, apart from exhaust and suction ports used in two-stroke engine?
- a. Transfer port
 - b. Transport valve
 - c. Top dead centre
 - d. Bottom dead center
27. What is the firing order of four-cylinder engines?
- a. 1-4-3-2
 - b. 1-3-4-2
 - c. 1-2-3-4
 - d. 4-3-2-1
28. The size of the engine intake valve is
- a. Larger than that of exhaust valve
 - b. Same as that of exhaust valve
 - c. Smaller than that of exhaust valve
 - d. Does not depend upon the size of exhaust valve
29. Which Battery are preferred for EV?
- a. Lead-acid
 - b. Lithium-ion
 - c. Sodium-sulphur
 - d. Nickel-cadmium
30. Which of the following has the same combustion as HCCI (Homogeneous Charge Compression Ignition) engine?
- a. SI engine
 - b. CI engine

- c. Hybrid of both SI and CI engine
 - d. Wankel engine
31. What is the correct stoichiometric ratio for an air-fuel mixture?
 - a. 14.7:1
 - b. 14:1
 - c. 15:1
 - d. 9:1
 32. What are the types of Multi-Point Fuel Injection System?
 - a. port injection
 - b. throttle body injection
 - c. port & throttle body injection
 - d. Valve injection
 33. In magnetic ignition system, the primary current is produced by _____
 - a. battery
 - b. magnet
 - c. electrical current
 - d. ice
 34. Which is not the phase of CI engine combustion?
 - a. ignition delay period
 - b. period of rapid combustion
 - c. period of controlled combustion
 - d. exhaust gas
 35. In most automobiles, which lubrication system is commonly used?
 - a. Splash system
 - b. Pressure system
 - c. Petrol system
 - d. Gravity system
 36. Which of the following is not the effect of supercharging?
 - a. Improved cold starting
 - b. Increased gas loading
 - c. Reduced exhaust smoke
 - d. Increased thermal loads
 37. The power developed by an engine at the output shaft is called _____
 - a. brake power
 - b. indicated power
 - c. mean effective pressure
 - d. Friction power
 38. The volumetric efficiency is defined as the ratio of
 - a. total volume / piston displacement volume
 - b. total volume / gas volume taken during suction
 - c. gas volume taken during suction / swept volume
 - d. swept volume / gas volume taken during suction
 39. Which are two Hydrocarbons present in LPG?

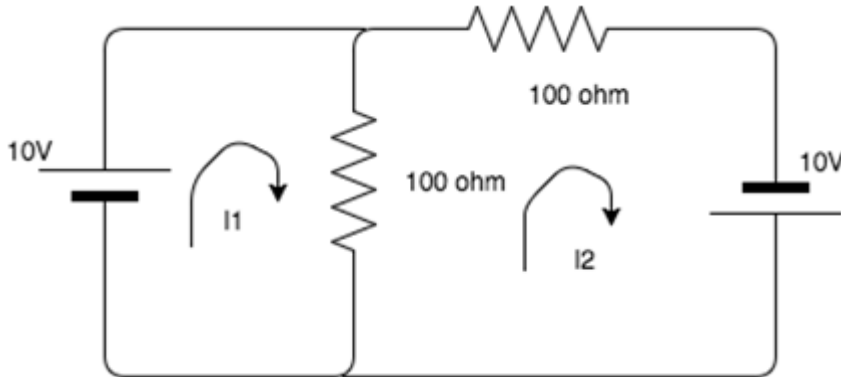
- a) Butane and Pentane
 - b) Methane and ethane
 - c) Butane and propane
 - d) Pentane and Hexane
40. Which electronic device controls the engine system?
- a. Regulator
 - b. ECM
 - c. Fuse
 - d. Switch
41. _____ Sensor senses the amount of oxygen in the engine exhaust and calculates air-fuel ratio.
- a) Engine temperature
 - b) Exhaust gas
 - c) Air flow
 - d) Air inlet temperature
42. Sulphation in a lead acid battery occurs due to
- a. Heavy charging
 - b. Fast charging
 - c. Trickle charging
 - d. Incomplete charging
43. Which of the following parts does not include an automobile chassis?
- a) Differential
 - b) Brakes
 - c) Steering system
 - d) Shock absorbers
44. Where is the clutch located?
- a) Between transmission and engine
 - b) Between transmission and rear axle
 - c) Between transmission and propeller shaft
 - d) Between transmission and differential
45. If the front of the front wheels is inside and rear of front wheels are apart when the vehicle is at rest, then the configuration is called
- a) Toe out
 - b) Toe-in
 - c) Positive camber
 - d) Positive castor
46. The skidding of vehicles, while sudden brakes are applied, is avoided through _____
- a) Antilock braking system
 - b) Engine management system
 - c) Automatic car parking system
 - d) Driving system
47. The function of an alternator in an automobile is to

- a. Supply electric power
 - b. Converts mechanical energy into electrical energy
 - c. Continually recharges the battery
 - d. Partly converts engine power into electric power
48. Resistance generated by air to the movement of the vehicle with N speed is proportional to?
- a. N^3
 - b. $1/N$
 - c. N
 - d. N^2
49. Which of the following error is caused by poor calibration of the instrument?
- a) Random error
 - b) Gross error
 - c) Systematic error
 - d) Precision error
50. Which one of the following is not a technique of inventory control?
- a. ABC analysis
 - b. FSN analysis
 - c. GOLF analysis
 - d. FTMN analysis
51. Low power generation in engine is due to
- a. Weak compression
 - b. High oil level
 - c. Oil viscosity too low
 - d. Leakage of oil
52. For what purpose is the Rhodium used?
- a) To reduce CO and HC
 - b) To reduce NO_x
 - c) To reduce CO
 - d) To reduce HC
53. When out at night, what should you wear to be seen easily by traffic?
- a. Dark colored clothed
 - b. Bright fluorescent clothes
 - c. Pale colored clothes
 - d. Trendy clothes
54. How should one behave to the traffic police when she or he stops the vehicle showing your fault?
- (a) To insist that you haven't done anything wrong

- (b) To run away from the traffic police.
 - (c) To realize your mistake politely.
 - (d) To make other drivers your witness insisting that you haven't done anything wrong
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. Find the value of the currents I1 and I2.



- a) 0.3, 0.1
 - b) -0.1, -0.3
 - c) -0.3, -0.1
 - d) 0.1, 0.2
62. What is the Eutectic reaction at 1146°C?
- a) $L (0.53\% C) + \delta(0.09\% C) \rightarrow \gamma(0.17\% C)$
 - b) $L (4.3\% C) \rightarrow \gamma(2.1\% C) + Fe_3C (6.67\% C)$
 - c) $\gamma (0.8\% C) \rightarrow \alpha (0.025\% C) + Fe_3C (6.67\% C)$
 - d) $L (0.53\% C) + \delta(0.09\% C) \rightarrow \gamma (0.8\% C)$
63. The specific volume of a wet steam at 1600°C, 80% quality, $v_f = 0.011 \text{ m}^3/\text{kg}$ and $v_g = 0.3071 \text{ m}^3/\text{kg}$ is
- a. 1.00
 - b. 1.09
 - c. 1.25
 - d. 0.25
64. In an engine working on an ideal Otto cycle, the temperature at the beginning and at the end of the compression are 27°C and 327°C. What will be the compression ratio? (Assume constant specific heat and its ratio $\gamma = 1.4$)
- a. $2^{2.5}$
 - b. $(1/2)^{2.5}$
 - c. $(2)^{1/1.4}$
 - d. $(1/2)^{1/1.4}$
65. A hydro-turbine with Net head 90m and discharge 10 Cumecs will have the generation output as
- a) 7 MW
 - b) 8 MW
 - c) 9 MW
 - d) 10 MW

66. To lift a water up to 30m head with 10 lit/sec, a centrifugal pump with kW motor is needed.
- 2 kW
 - 4kW
 - 7 kW
 - 10 kW
67. The resultant of two forces each equal to P and acting at right angles is
- $P/\sqrt{2}$
 - $P/2$
 - $2\sqrt{2} P$
 - $\sqrt{2}P$
68. Two simply supported beams are of equal length. One carries a central load of W and other carries the uniformly distributed load such that total load is W. The ratio of maximum deflection in two cases is
- 8/5
 - 8/6
 - 8/7
 - 5/4
69. What is the compression ratio of an engine whose dimensions are 100 mm*120 mm and length of clearance space at the top dead centre being 8 mm?
- 16:1
 - 32:1
 - 1:16
 - 1:32
70. Which of the following is true for the HCCI engine?
- Emits high NO_x and soot
 - Have a large power range
 - Efficiency is comparatively less
 - Pre-catalyst hydrocarbon emissions are higher
71. Which of the following is correct?
- An increase in temperature of the combustion chamber of the SI engine decreases the tendency of knocking
 - An increase in the power output of the SI engine decreases the tendency to knock
 - Increase in compression ratio decreases the knocking tendency of the SI engine
 - Increase in compression ratio increases the knocking tendency of the SI engine
72. In actual 4S four-stroke diesel engine, the injection of fuel inside the cylinder cut off when the piston approaches
- 25° before TDC
 - 25° before BDC
 - 25° after TDC

- d) 25° after BDC
73. A single cylinder, four stroke cycle oil engine is fitted with a rope brake. The diameter of the brake wheel is 600 mm and the rope diameter are 26 mm. The dead load on the brake is 200 N and the spring balance reads 30 N. If the engine runs at 450 r.p.m., what will be the brake power of the engine?
- a) 2 kW
 - b) 2.5 kW
 - c) 3 kW
 - d) 3.5 kW
74. Which is the correct sequence of the decreasing order of brake thermal efficiency of the three given basic types of engines?
- a) four stroke C.I. engine, four stroke S.I. engine, two stroke S.I. engine
 - b) four stroke S.I. engine, four stroke C.I. engine, two stroke S.I. engine
 - c) four stroke C.I. engine, two stroke S.I. engine, four stroke S.I. engine
 - d) two stroke S.I. engine, four stroke S.I. engine, four stroke C.I. engine
75. If the wheelbase, the pivot center, and wheel track of the are 2.5 m, 1.1 m, and 1.3 m respectively. The angle of the inside lock is 42° . What is the circle radius of the outer front wheel?
- a) 2.6 m
 - b) 3.6 m
 - c) 4.6 m
 - d) 1.6 m
76. If the vehicle mass is 800 kg, what is the gradient force (approximate value in N) caused by the road gradient 10%?
- a) 500 N
 - b) 600 N
 - c) 700 N
 - d) 800 N
77. Purging is the process by which the gasoline vapors are removed from the charcoal particles inside the _____
- a) Float chamber
 - b) Tank
 - c) Canister
 - d) Cylinder
78. Which of the following is the standard format for recording defects at a service station?
- a) Job card
 - b) Vehicle manual
 - c) Log book
 - d) Maintenance manual

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