

**Nepal Engineering Council Registration Examination**  
**MODEL QUESTION**  
**for**  
**Mechatronics Engineering**

1. A ceiling fan uses \_\_\_\_\_  
[Option]
  - a) split-phase motor
  - b) capacitor start and capacitor run motor
  - c) universal motor
  - d) capacitor start motor
  
2. The common collector amplifier is also known as \_\_\_\_\_  
[Option]
  - a) collector follower
  - b) Base follower
  - c) Emitter follower
  - d) Source follower
  
3. Which of these sets of logic gates are known as universal gates?  
[Option]
  - a) XOR, NAND, OR
  - b) OR, NOT, XOR
  - c) NOR, NAND, XNOR
  - d) NOR, NAND
  
4. Kinematic link, chain and inversion, Types of joints, Belts, chain and gear drives  
[Option]
  - a) zero
  - b) varies linearly
  - c) varies exponentially
  - d) constant
  
5. Heat transfer takes place according to which of the following law?  
[Option]
  - a) First law of thermodynamics
  - b) Second law of thermodynamics
  - c) Newton's second law of motion
  - d) Newton's law of cooling
  
6. Which of the following manufacturing process is favourable for making tool for ECM?  
[Option]
  - a) Cold forging
  - b) Casting
  - c) Shaping
  - d) Laser cutting

7. Pressure of 1 bar is equal to \_\_\_\_\_  
[Option]  
a) 14.5 psi  
b) 145 psi  
c) 12.5 psi  
d) 125 psi
8. Which of the following is used as a component in hydraulic power unit?  
[Option]  
a) pressure gauge  
b) filler gauge  
c) valve  
d) reservoir
9. Which component of a hydraulic system is used to store the sufficient amount of hydraulic oil?  
[Option]  
a) Rotatory pumps  
b) Oil reservoir  
c) Flow control valve  
d) Pressure gauge
10. In pneumatic system, an AND gate is known as \_\_\_\_\_  
[Option]  
a) non-return valve  
b) gate valve  
c) check valve  
d) dual-pressure valve
11. Which of the following logic valve is known as shuttle valve?  
[Option]  
a) OR gate  
b) AND gate  
c) NOR gate  
d) NAND
12. Automation system is also called as \_\_\_\_\_.  
[Option]  
a) Process automation  
b) Automatic technique  
c) Manual process  
d) Output automation
13. Which of the following is not the feature of a modern control system?  
[Option]  
a) Correct power level  
b) No oscillation  
c) Quick response  
d) Accuracy

14. Most hydraulic circuits:  
[Option]
- a) Operate from a central hydraulic power unit
  - b) Use air-over-oil power units
  - c) Have a dedicated power unit
  - d) Does not have dedicated power unit
15. The identical first order system have been cascaded non-interactively. The unit step response of the systems will be:  
[Option]
- a) Overdamped
  - b) Underdamped
  - c) Undamped
  - d) Critically damped
16. If gain margin and phase margin both are positive, then the system is said to be:  
[Option]
- a) stable
  - b) unstable
  - c) critically stable
  - d) marginally stable
17. When gain  $K$  of the open-loop transfer function of order greater than unity is varied from zero to infinity, the closed-loop system  
[Option]
- a) may become unstable
  - b) stability may improve
  - c) stability may not be affected
  - d) will become highly stable
18. A temperature control system is known as  
[Option]
- a) process control system
  - b) servomechanism
  - c) cascade control system
  - d) procedure control system
19. Sensor provides output signal depending on \_\_\_\_\_.  
[Option]
- a) process
  - b) Input
  - c) reaction
  - d) current
20. How many pins does temperature sensor have?  
[Option]
- a) 5 legs
  - b) 4 legs
  - c) 3 legs
  - d) 2 legs

21. Thermocouple generate output voltage according to \_\_\_\_\_  
[Option]  
a) Circuit parameters  
b) Humidity  
c) Temperature  
d) Voltage
22. A sensor that detects inclination or tilt is called \_\_\_\_\_.  
[Option]  
a) Position sensor  
b) Tilt sensor  
c) Angled sensor  
d) Turn sensor
23. Radiation sensor detects radiation level from \_\_\_\_\_ objects.  
[Option]  
a) Radioactive  
b) Electrical  
c) Mechanical  
d) black
24. One advantage of an electric to pneumatic valve positioner is  
[Option]  
a) It can be used on flow control  
b) It produces positive valve position  
c) It conserves energy  
d) It dampers valve travels
25. The process of superimposing message signal with the carrier wave is known as:  
[Option]  
a) demodulation  
b) attenuation  
c) modulation  
d) detection
26. The process selecting a desired frequency out of a complex wave is called  
[Option]  
a) superposition  
b) modulation  
c) tuning  
d) demodulation
27. On which of the following frequencies does a Wi-Fi network work?  
[Option]  
a) 2.4 MHz  
b) 5 MHz  
c) 10 GHz  
d) 5 GHz

28. In TV transmission  
[Option]
- a) AM for picture and FM for sound are employed
  - b) FM for picture and AM for sound are employed
  - c) FM is employed for both picture and sound
  - d) AM is employed for both picture and sound
29. Which of the following is not an example of wireless communication?  
[Option]
- a) Wi-Fi
  - b) Mobiles
  - c) Landline
  - d) Wireless Computer Parts
30. T Which circuit is called as regenerative repeaters?  
[Option]
- a) Analog circuits
  - b) Digital circuits
  - c) Amplifiers
  - d) A/D converters
31. What is a digital recorder?  
[Option]
- a) records digital data
  - b) records analog data
  - c) does not record data
  - d) records both analog and digital data
32. The roots of the equation  $H(z)$  must occur in \_\_\_\_\_  
[Option]
- a) Identical
  - b) Zero
  - c) Reciprocal pairs
  - d) Conjugate pairs
33. F.M systems as compared to A.M systems  
[Option]
- a) are equally affected by noise
  - b) are less affected by noise
  - c) are more affected by noise
  - d) are highly affected by noise sense they operate at VHF and UHF
34. Digital instruments have input impedance of the order of\_\_\_\_  
[Option]
- a)  $\Omega$
  - b)  $k\Omega$
  - c)  $M\Omega$
  - d)  $m\Omega$

35. Switching time of LEDs is of the order of\_\_\_\_\_
- [Option]
- a) 1 s
  - b) 1 ms
  - c) 1  $\mu$ s
  - d) 1 ns
36. The gas used in plasma screens is a mixture of
- [Option]
- a) nitrogen and oxygen
  - b) nitrogen and xenon
  - c) argon and nitrogen
  - d) argon and xenon
37. Which of the following elements transfers torque and is only subjected with the bending moment?
- [Option]
- a) Brake
  - b) Clutch
  - c) Axle
  - d) Belt drive
38. What is the function of bearing?
- [Option]
- a) generate heat
  - b) ease of motion of shafts and gears
  - c) balancing shaft
  - d) rotate at high speed
39. The most suitable bearing for carrying very heavy loads at slow speed is\_\_\_\_\_
- [Option]
- a) hydrodynamic bearing
  - b) ball-bearing
  - c) roller bearing
  - d) hydro-static bearing
40. Axial thrust is not there in which of the following gears?
- [Option]
- a) double helical gear
  - b) bevel gear
  - c) spiral gear
  - d) single helical gear
41. Which of the following methods cannot be used for welding carbon steel?
- [Option]
- a) Arc welding
  - b) Gas welding
  - c) Ultrasonic welding
  - d) Forge welding

42. For which of the following design factor of safety the design will work properly?

[Option]

- a) 0.1
- b) 0.9
- c) 1
- d) 2

43. What is Microprocessor?

[Option]

- a) A multipurpose PLD that accepts binary data as input
- b) A multipurpose PLD that accepts an integer as input
- c) A multipurpose PLD that accepts whole numbers as input
- d) A multipurpose PLD that accepts prime numbers as input

44. What is the word length of an 8-bit microprocessor?

[Option]

- a) 8 bits – 64 bits
- b) 4 bits – 32 bits
- c) 8 bits – 16 bits
- d) 8 bits – 32 bits

45. What is the word length of the Pentium-II microprocessor?

[Option]

- a) 8-bit
- b) 32-bit
- c) 64-bit
- d) 16-bit

46. CCTV cameras is an example for \_\_\_\_\_ automation.

[Option]

- a) Building automation
- b) Office automation
- c) Scientific automation
- d) Industrial automation

47. \_\_\_\_\_ is an example for light automation?

[Option]

- a) Rocket launching
- b) Street solar lightening
- c) Automated bottle filling stations
- d) Smoke detectors

48. Relays is a \_\_\_\_\_ device.

[Option]

- a) Electrical
- b) Electronic
- c) Mechanical
- d) Electromechanical

49. Which is the first aspect which needs to be considered in the Mechatronics design process?  
[Option]
- a) Hardware integration and simulation
  - b) Conceptual design
  - c) Mathematical modeling
  - d) Modeling and simulation
50. Which phase of a mechatronics system consists of hardware designing?  
[Option]
- a) Prototyping
  - b) Modeling
  - c) Simulation
  - d) Deployment
51. Who was the inventor of mechatronics?  
[Option]
- a) Robert H
  - b) Testudo Mori
  - c) De Silva
  - d) W. Bolton
52. To meet the customer's demand in today's market, we need:  
[Option]
- a) Rapid Manufacturing
  - b) Conventional Manufacturing
  - c) Unconditional Manufacturing
  - d) Simple manufacturing
53. What material is not used in 3D printing?  
[Option]
- a) Nylon
  - b) ABS
  - c) PLA
  - d) PVC
54. An Algorithm is said as Complete algorithm if \_\_\_\_\_  
[Option]
- a) It ends with a solution (if any exists).
  - b) It begins with a solution.
  - c) It does not end with a solution.
  - d) It contains a loop.
55. Standard dimensions of A3 drawing sheet in mm is  
[Option]
- 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  
[Option]
- 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  
[Option]
- 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  
[Option]
- 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  
[Option]
- a) pastoral society
  - b) tribal society
  - c) horticultural society
  - d) agricultural society
60. According to NEC Act (Revised), the number of executive members in a council body is  
[Option]
- a) 25
  - b) 21
  - c) 18
  - d) 15
61. A 1:5 step-up transformer has 120V across the primary and 600 ohms resistance across the secondary. Assuming 100% efficiency, the primary current equals \_\_\_\_\_  
[Option]
- a) 0.2 Amp
  - b) 5 Amps
  - c) 10 Amps
  - d) 20 Amps

62. What is the conductivity of an extrinsic type semiconductor electronic device at 0K?  
[Option]
- a) maximum
  - b) zero
  - c) can't be determined
  - d) minimum
63. If a person studies about a fluid which is at rest, what will you call his domain of study?  
[Option]
- a) Fluid Dynamics
  - b) Fluid Mechanics
  - c) Fluid Statics
  - d) Fluid Kinematics
64. Which is an electro-pneumatic device?  
[Option]
- a) Seven Segment display
  - b) BO Motor
  - c) Hydraulic cylinder
  - d) Lithium battery
65. What is a process control system?  
[Option]
- a) system to keep the parameters at zero value
  - b) system to maintain the parameters constant
  - c) system to keep the parameters at highest value
  - d) system to check the voltage
66. Asymptotic stability is concerned with:  
[Option]
- a) A system under influence of input
  - b) A system not under influence of input
  - c) A system under influence of output
  - d) A system not under influence of output
67. Sensors convert signals from analog to \_\_\_\_\_ domain.  
[Option]
- a) Digital
  - b) Mechanical
  - c) Electrical
  - d) Electronic
68. Which of the motions in actuators are preferred?  
[Option]
- a) Translator
  - b) Rotary
  - c) Stationary
  - d) Non-Stationary

69. The ability of the receiver to select the wanted signals among the various incoming signals is termed as \_\_\_\_\_

[Option]

- a) Sensitivity
- b) Selectivity
- c) Stability
- d) Reliability

70. What is wireless communication?

[Option]

- a) Sending data from one location to with the use of physical medium
- b) Sending data from one location to another without the use of physical medium
- c) Sending data from one location to another without the use of virtual medium
- d) Sending data from one location to another with wire

71. Which of the following is not true for telemeter?

[Option]

- a) Designed for all variable
- b) Designed for specific range
- c) Designed for data transmission
- d) Wireless data transmission possible

72. Modem is an acronym of

[Option]

- a) Modulation
- b) Demodulation
- c) Modulation and demodulation
- d) neither modulation nor demodulation

73. The relation between mating parts is called \_\_\_\_\_

[Option]

- a) Connection
- b) Fits
- c) Joints
- d) Link

74. \_\_\_\_\_ is the measure of density of oil.

[Option]

- a) Specific gravity
- b) Film strength
- c) Adhesiveness
- d) viscosity

75. Which of the following is not a microprocessor?

[Option]

- a) Z8000
- b) Motorola 6809
- c) Zilog Z8
- d) PIC1x

76. Who invented the Programmable Logic Controller (PLC)?

[Option]

- a) Jonas Wenstrom
- b) Dick Morley
- c) Thomas Davenport
- d) Thomas Sterry Hunt

77. A servo motor is a typical example of \_\_\_\_\_

[Option]

- a) Electronics system
- b) Mechanical system
- c) Computer system
- d) Mechatronics system

78. Which organization has developed the humanoid robot “Sophia”?

[Option]

- a) Google
- b) Amazon
- c) Hanson Robotics
- d) Texas Instruments

79. Effective monthly interest rate will be ....., if nominal interest rate of 10% accounted for continuous compounding

[Option]

- 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

[Option]

- a) 9 days
- b) 10 days
- c) 15 days
- d) 24 days

