UTO Mechanical – MCQ Question Bank (Set 3)

100 Completely New Questions with Answers & Explanations

1. The primary function of a carburetor in an SI engine is to:

A. Compress air

B. Mix air and fuel

C. Supply only fuel

D. Increase engine speed

Answer: B

Explanation: Carburetors create the proper air–fuel mixture for combustion.

2. A thermocouple works on the principle of:

A. Seebeck effect

B. Hall effect

C. Piezoelectric effect

D. Joule effect

Answer: A

Explanation: Seebeck effect generates voltage from temperature difference.

3. A hydraulic accumulator is used to:

A. Store heat

B. Store pressure energy

C. Increase viscosity

D. Reduce friction

Answer: B

Explanation: It stores hydraulic energy for sudden load demand.

4. Ratio of shear stress to shear strain is:

A. Elastic modulus

B. Shear modulus

C. Bulk modulus

D. Poisson’s ratio

Answer: B

Explanation: Shear modulus G defines shear response.

5. Diesel engines operate on the:

A. Otto cycle

B. Diesel cycle

C. Dual cycle

D. Rankine cycle

Answer: B

Explanation: Diesel engines use constant-pressure heat addition.

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6. The frictional force is proportional to:

A. Area

B. Normal reaction

C. Surface volume

D. Velocity

Answer: B

7. The ratio of heat added to net work output of a cycle is:

A. COP

B. Thermal efficiency

C. Work ratio

D. Energy factor

Answer: B

8. The most common material for lathe beds is:

A. Lead

B. Cast iron

C. Steel

D. Brass

Answer: B

9. In a Pelton turbine, the energy conversion is mainly:

A. Pressure to velocity

B. Velocity to pressure

C. Kinetic to mechanical

D. Potential to thermal

Answer: C

10. The clearance volume in an IC engine affects:

A. Power output

B. Compression ratio

C. Air–fuel ratio

D. Timing

Answer: B

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11. Forced convection depends on:

A. Gravitational forces

B. Fluid motion due to external means

C. Only temperature differences

D. No fluid movement

Answer: B

12. The volumetric efficiency of compressors increases with:

A. High clearance

B. Low clearance

C. High pressure

D. High temperature

Answer: B

13. A four-bar mechanism has:

A. 1 link

B. 2 links

C. 3 links

D. 4 links

Answer: D

14. The modulus of rigidity is used in:

A. Bending

B. Shear

C. Axial stress

D. Thermal stress

Answer: B

15. A centrifugal pump is a:

A. Positive displacement pump

B. Dynamic pump

C. Reciprocating pump

D. Jet pump

Answer: B

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16. Mach number < 1 represents:

A. Sonic

B. Supersonic

C. Subsonic

D. Hypersonic

Answer: C

17. In refrigeration, throttling is an:

A. Isothermal

B. Isochoric

C. Isenthalpic

D. Adiabatic reversible

Answer: C

18. The performance of a nozzle is highest when:

A. Flow is subsonic throughout

B. Exit pressure equals ambient

C. Shock waves form

D. Friction increases

Answer: B

19. The center of pressure is the point where:

A. Force acts

B. Bending moment is zero

C. Thrust acts on surfaces

D. Torque is applied

Answer: C

20. A material with high resilience can:

A. Absorb energy

B. Stretch infinitely

C. Resist corrosion

D. Withstand high temperature

Answer: A

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21. The ratio of actual deflection to theoretical is called:

A. Stiffness

B. Flexibility

C. Load factor

D. Correction factor

Answer: D

22. MIG welding uses:

A. Tungsten electrode

B. Consumable electrode

C. No electrode

D. Graphite electrode

Answer: B

23. Refrigerant R-22 is a:

A. CFC

B. HCFC

C. HFC

D. Ammonia

Answer: B

24. Thermal diffusivity is given by:

A. kρCp

B. k/ρCp

C. ρCp/k

D. Cp/kρ

Answer: B

25. A steam nozzle converts:

A. Heat → work

B. Pressure → velocity

C. Velocity → pressure

D. Heat → pressure

Answer: B

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26. The efficiency of a simple gas turbine increases with:

A. Lower turbine inlet temperature

B. Higher combustion pressure

C. Higher compressor inlet temperature

D. More friction

Answer: B

27. The unit of specific heat is:

A. J/kg

B. J/kg·K

C. J

D. kW

Answer: B

28. A universally used bearing material is:

A. Bronze

B. Babbitt

C. Steel

D. Tin

Answer: B

29. In conduction, heat transfer depends on:

A. Thermal conductivity

B. Area

C. Temperature gradient

D. All of the above

Answer: D

30. In laminar flow in a pipe:

A. Friction factor decreases with Reynolds number

B. Friction factor is constant

C. Friction factor increases

D. No friction occurs

Answer: A

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31. The highest efficiency of a boiler is achieved by:

A. Superheating

B. Economizer

C. Air preheater

D. All of the above

Answer: D

32. The unit of dynamic viscosity is:

A. $N \cdot s/m^2$

B. N/m

C. W/m^2

D. J/kg

Answer: A

33. The strain energy stored in a body is:

A. Elastic energy

B. Plastic energy

C. Thermal energy

D. Kinetic energy

Answer: A

34. A governor maintains:

A. Temperature

B. Pressure

C. Speed

D. Fuel flow

Answer: C

35. Brayton cycle efficiency depends mainly on:

A. Pressure ratio

B. Temperature ratio

C. Volume ratio

D. Mass

Answer: A

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36. The maximum stress in a beam occurs at:

A. Neutral axis

B. Outermost fiber

C. Midpoint

D. Shear center

Answer: B

37. The Bernoulli equation applies to:

A. Incompressible fluids

B. Steady flow

C. Inviscid fluids

D. All of the above

Answer: D

38. The main component of bronze is:

A. Copper

B. Zinc

C. Tin

D. Lead

Answer: C

39. Creep resistance is important for:

A. Room temperature operations

B. High temperature equipment

C. Cold storage

D. Water pumps

Answer: B

40. A forced vortex has:

A. Zero vorticity

B. Constant vorticity

C. Unstable flow

D. No circulation

Answer: B

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41. The shaft connecting engine and generator is a:

A. Axle

B. Rotor

C. Coupling

D. Crank

Answer: C

42. Free convection occurs when:

A. Pump forces fluid

B. Fan circulates air

C. Density gradient drives motion

D. Pressure increases

Answer: C

43. Interference in gears occurs when:

A. Gear teeth collide improperly

B. Speed increases

C. Lubrication fails

D. Noise decreases

Answer: A

44. Sensible heat causes:

A. Phase change

B. Temperature change

C. Chemical change

D. No heat change

Answer: B

45. A pump loses prime due to:

A. Air leakage

B. High speed

C. High temperature

D. Low viscosity

Answer: A

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46. The basic refrigerator cycle uses:

A. Heat engine

B. Reverse Brayton

C. Vapour compression

D. Gas turbine

Answer: C

47. Flash point is always:

A. Below fire point

B. Above fire point

C. Equal to ignition point

D. Temperature independent

Answer: A

48. In metal cutting, chip thickness ratio is:

A. t2/t1

B. t1/t2

C. (t1+t2)/2

D. t1-t2

Answer: B

49. Highest thermal conductivity is for:

A. Water

B. Copper

C. Steam

D. Air

Answer: B

50. Reciprocating compressors are suitable for:

A. High pressure

B. Low pressure

C. High flow

D. Low temperature

Answer: A

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51 to 100

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51. Draft in boilers is produced by:

A. Forced fans

B. Chimney

C. Induced draft

D. All of the above

Answer: D

52. A multistage pump improves:

A. Flow rate

B. Head

C. Cavitation

D. Blade erosion

Answer: B

53. The stagnation point has:

A. Maximum pressure

B. Minimum pressure

C. Zero velocity

D. Both A and C

Answer: D

54. Poisson’s ratio relates:

A. Shear and torque

B. Thermal and elastic strain

C. Lateral and longitudinal strain

D. Pressure and volume

Answer: C

55. Tool life is increased by:

A. Higher speed

B. Improper cooling

C. Better lubrication

D. More friction

Answer: C

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56. Latent heat changes:

A. Temperature

B. Phase

C. Pressure

D. Volume

Answer: B

57. A diffuser converts:

A. Velocity to pressure

B. Pressure to velocity

C. Heat to work

D. Temperature to pressure

Answer: A

58. Hardness is resistance to:

A. Thermal expansion

B. Heat conduction

C. Indentation

D. Fracture

Answer: C

59. A cantilever beam is fixed at:

A. Both ends

B. One end only

C. Center

D. No end

Answer: B

60. The main purpose of lubrication is to reduce:

A. Pressure

B. Temperature

C. Friction

D. Density

Answer: C

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61. A supercharger increases:

A. Temperature

B. Air pressure entering engine

C. Fuel flow

D. Noise

Answer: B

62. A vacuum pump reduces:

A. Density

B. Pressure

C. Temperature

D. Velocity

Answer: B

63. Heat exchangers use:

A. Conduction only

B. Convection only

C. Radiation only

D. All modes

Answer: D

64. Shot peening increases:

A. Hardness

B. Fatigue strength

C. Thermal conductivity

D. Toughness

Answer: B

65. A closed cycle gas turbine uses:

A. Same air repeatedly

B. Fresh air

C. Steam

D. Refrigerant

Answer: A

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66. Coefficient of discharge is:

A. Cv × Cc

B. Cv/Cc

C. Cc/Cv

D. None

Answer: A

67. Superheated steam reduces:

A. Turbine erosion

B. Efficiency

C. Specific volume

D. Moisture in condenser

Answer: A

68. Rolling friction is:

A. Higher than sliding

B. Lower than sliding

C. Infinite

D. Zero

Answer: B

69. Diffusion of gases follows:

A. Newton’s law

B. Fick’s law

C. Pascal’s law

D. Faraday's law

Answer: B

70. A turbine converts:

A. Mechanical → hydraulic

B. Hydraulic → mechanical

C. Thermal → chemical

D. Potential → electrical

Answer: B

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71. In CNC machines, G-code defines:

A. Speed

B. Feed

C. Motion path

D. Coolant

Answer: C

72. Creep rate increases with:

A. Lower temperature

B. Higher temperature

C. Lower stress

D. Decreased strain

Answer: B

73. In pumps, NPSH is required to avoid:

A. Leakage

B. Cavitation

C. Heat loss

D. Friction

Answer: B

74. A manometer works on:

A. Gas laws

B. Hydrostatic law

C. Thermodynamics

D. Elasticity

Answer: B

75. The Jacob number relates:

A. Heat and mass transfer

B. Temperature and conductivity

C. Pressure and velocity

D. Density and viscosity

Answer: A

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76. A flat belt transmits power by:

A. Adhesion

B. Friction

C. Impact

D. Magnetic effect

Answer: B

77. The gear used for non-intersecting shafts is:

A. Spur

B. Helical

C. Bevel

D. Worm

Answer: D

78. A heat pump moves heat:

A. From low to high temperature

B. From high to low

C. Without power

D. Only in winter

Answer: A

79. Cast iron is used due to:

A. High ductility

B. High compressive strength

C. High tensile strength

D. Low brittleness

Answer: B

80. A flywheel stores:

A. Potential energy

B. Kinetic energy

C. Chemical energy

D. Electrical energy

Answer: B

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81. A polytropic process obeys:

A. PV = constant

B. PV^n = constant

C. P/T = constant

D. V/T = constant

Answer: B

82. The main element in stainless steel is:

A. Chromium

B. Copper

C. Lead

D. Zinc

Answer: A

83. A nozzle is used to:

A. Increase pressure

B. Increase velocity

C. Reduce heat

D. Maintain flow

Answer: B

84. Thermal expansion depends on:

A. Heat capacity

B. Coefficient of expansion

C. Conductivity

D. Surface area

Answer: B

85. A manometer measures:

A. Velocity

B. Pressure

C. Temperature

D. Entropy

Answer: B

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86. The Otto cycle efficiency increases with:

A. Higher compression ratio

B. Lower compression ratio

C. Higher speed

D. Higher fuel rate

Answer: A

87. Hydraulics is based on:

A. Bernoulli

B. Newton

C. Pascal

D. Rankine

Answer: C

88. A helical gear has:

A. Straight teeth

B. Inclined teeth

C. Curved teeth

D. No teeth

Answer: B

89. The condenser pressure in a Rankine cycle must be:

A. High

B. Low

C. Moderate

D. Constant

Answer: B

90. Throttling reduces:

A. Enthalpy

B. Pressure

C. Temperature

D. Both B and C

Answer: B

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91. A turbine blade is subjected to:

A. Bending

B. Torsion

C. Thermal stress

D. All of the above

Answer: D

92. A hydraulic jack works on:

A. Boyle’s law

B. Pascal’s law

C. Hooke’s law

D. Joule’s law

Answer: B

93. The air standard cycle for SI engines is:

A. Otto

B. Diesel

C. Dual

D. Brayton

Answer: A

94. A dynamometer measures:

A. Speed

B. Power

C. Torque

D. Both B and C

Answer: D

95. CNC tool wear is monitored using:

A. Sensors

B. Cameras

C. Manual checking

D. None

Answer: A

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96. The energy stored in compressed air is:

A. Kinetic

B. Potential

C. Chemical

D. Thermal

Answer: B

97. The coefficient of performance of a refrigerator is:

A. Heat rejected / work

B. Heat absorbed / work

C. Work / heat absorbed

D. Work / heat rejected

Answer: B

98. A dead weight tester calibrates:

A. Temperature

B. Pressure gauge

C. Flowmeter

D. Tachometer

Answer: B

99. Hydrodynamic lubrication occurs at:

A. Low speed

B. High speed

C. Zero speed

D. No load

Answer: B

100. A water hammer is sudden rise in:

A. Temperature

B. Pressure

C. Velocity

D. Flow rate

Answer: B