

## MECHANICAL ENGINEERING

S.No	
1.	Mercury is normally used barometers due to its <b>Very low vapour pressure</b>
2.	Adverse pressure gradient is the cause of <b>separation of boundary layer</b>
3.	In a turbulent flow the velocity distribution in a pipe is normally assumed to <b>Vary as per 1/7<sup>th</sup> power law</b>
4.	Hydraulic energy is converted into another form of energy by hydraulic machines. What form of energy is that? <b>Mechanical Energy</b>
5.	Kaplan ,Francis and propeller turbines fall under the category of <b>Reaction turbine</b>
6.	By applying principle of conservation of momentum, treating the fluid as incompressible and inviscid, for ideal fluid, the equation of motion takes the form <b>Euler's equation</b>
7.	If a pipe of twice the diameter but of the same length is to carry a flow rate of 2Q, The loss of head in a pipe of certain length carrying a rate of flow of Q is found to be H, the head loss is <b>H/8</b>
8.	For parameters with usual notation, the specific speed of a hydraulic turbine is <b><math>N\sqrt{P}/H^{5/4}</math></b>
9.	At what distance from the boundary layer, when laminar flow takes place in a circular tube , with R as radius, the local velocity reaches the average velocity? <b>0.293R</b>
10.	A hydraulic reaction turbine working under s head of 16 m develops 640 kW of power, the Unit Power is <b>10 kW</b>
11.	The body whose surface does not coincide with the streamline when placed in a flow is <b>bluff body</b>
12.	In pipes, the cause of water hammer is due to <b>By closing the valve, the fluid is brought rest.</b>
13.	The function of priming in pumps is to <b>Remove air from suction pipe and casing.</b>
14.	Draft tube in a reaction type hydraulic turbines is to <b>Convert kinetic energy to pressure energy</b>
15.	Classical thermodynamics deals treating with <b>Macroscopic approach</b>
16.	When a system is said to be thermodynamic equilibrium, if it satisfies <b>Thermal, mechanical and chemical equilibria</b>
17.	The maximum amount of work that can be extracted from a system is based on the following law of thermodynamics <b>Kelvin –Planck's statement of second law</b>
18.	If a substance is said to be Pure Substance, it should be <b>Exist in all three phases but constant chemical composition</b>

19.	The Carnot cycle efficiency of an engine working between <b>57%</b>
20.	An air standard cycle consists of two reversible isentropic processes, two reversible isochoric processes and one reversible isobaric process is <b>Dual cycle</b>
21.	The initial temperature of an ideal gas is 300K. For a one mole of such gas if it is throttled from 5 bar to 1 bar, the change in entropy of universe is <b>13.38kJ/K</b>
22.	For a reversible thermodynamic cycle, the following condition is applicable $\oint \frac{\delta Q}{T} = 0$
23.	During free expansion, the following is correct <b>Mechanical work</b>
24.	In multi-stage air compression, the perfect intercooling means <b>Saving in power to drive compressor</b>
25.	For a pure substance, at triple point, the condition valid <b>The substance exists in all three forms</b>
26.	If relative humidity is 100%, the following condition will hold good <b>Wet bulb depression is zero</b>
27.	Chemicals attack atoms within grain boundaries preferentially because they have <b>Higher energy than those in the grains.</b>
28.	What is the movement of block of atoms along certain crystallographic planes and directions, termed as? <b>Twinning</b>
29.	Surface imperfections which separate two orientations that are mirror images of one another is called <b>Twinned boundary</b>
30.	TTT diagram indicates time and temperature transformation of <b>Austenite</b>
31.	Which of the following materials generally exhibits a yield point? <b>Annealed and hot-rolled mild steel.</b>
32.	The alloying element mainly used to improve the endurance strength of steel material is <b>Vanadium</b>
33.	For improving the strength of steel at elevated temperatures, which one of the following alloying element is used? <b>Tungsten</b>
34.	Creep failure occurs due to <b>Formation of voids under a steady load at elevated temperature.</b>
35.	The material property that depends only on the basic crystal structure is <b>Elastic constant</b>
36.	The crystal structure of austenite is <b>Face centered cubic</b>
37.	What does primary creep in creep curve indicate? <b>Due to down deformation, resistance of metal increases</b>
38.	Which test can be performed without skilled labour? <b>Dye penetrant testing</b>
39.	Which among the following is the last step in magnetic particle test method?

	<b>demagnetization</b>
40.	Which among the following is a paramagnetic material? <b>Aluminum</b>
41.	An object of 30 kg is moved with a velocity of 2 m/s on a horizontal smooth surface. What is the velocity of the block for 4 seconds if force of 40 N is applied on it in the direction of force? <b>7.33 m/s</b>
42.	According to the principle of conservation of energy, under the action of _____ force, the sum of P.E and K.E of a particle remains constant. <b>conservative force</b>
43.	A stone undergoes projectile motion when thrown from top of the building. If it strikes the ground surface at a distance away from the building then its horizontal direction is _____ <b>more than range</b>
44.	If an elevator travels at constant velocity, the normal reaction R is given as _____ <b>mg</b>
45.	A block sliding down an inclined plane has acceleration _____ acceleration due to gravity. <b>less than</b>
46.	If a material has no uniform density throughout the body, then the position of centroid and center of mass are _____ <b>not identical</b>
47.	A circular bar is subjected to an axial force and shear force, the difference between two principle stresses is 120 MPa. Based on maximum shear stress theory what is the factor of safety, if elastic limit of the bar is 300 MPa? <b>2.5</b>
48.	Which of the following formulae is used to calculate tangential stress, when a member is subjected to stress in mutually perpendicular axis and accompanied by a shear stress? <b><math>\frac{\sigma_x - \sigma_y}{2} \sin \theta - \tau \cos 2\theta</math></b>
49.	According to Coulomb's theory, material subjected to complex stresses fails, if _____ shear stress induced in the material exceeds _____ shear stress at the yield point. <b>maximum, maximum</b>
50.	A vessel is said to be thin if <b>Stresses are uniform over the entire thickness</b>
51.	What is the ratio of hoop stresses in a spherical vs cylindrical shell of same diameter, thickness and under same pressure? <b>1:2</b>
52.	Stresses in a thin cylindrical shell under internal pressure is independent of <b>Length</b>
53.	A power transmitting ductile material shaft under P, T and M will be designed on the basis of <b>Guest Theory</b>
54.	Actual stress in the bolts of a flanged coupling of a shaft will be <b>Less than the designed strength</b>
55.	According to the principle of conservation of energy, under the action of _____ force, the sum of P.E and K.E of a particle remains constant. <b>conservative force</b>

56.	According to maximum strain energy theory, failure of material due to complex stresses occurs when total stored energy per unit volume at a point _____ <b>reaches the value of strain energy stored per unit volume at elastic limit</b>
57.	The basic steps for producing sand castings are <b>Pattern making , core making, moulding, etc.</b>
58.	The function of runner <b>Regulate molten metal flow to reach mould cavity</b>
59.	Permeability of moulding sand is to <b>Capable of permitting the gas evolved during moulding process</b>
60.	Preferable materials for pattern materials <b>Wood, metals and plastics</b>
61.	Green sand mould indicates that <b>Mould contains moisture</b>
62.	Rotating mould is used in-----casting process <b>Centrifugal Casting</b>
63.	A cold working forming process is performed <b>Below recrystallization temperature</b>
64.	Seamless tubes are made by <b>Forward extrusion</b>
65.	The required diameter of the blank for deep drawing of a cup of diameter d and height h is given by $\sqrt{d^2 + 4dh}$
66.	In sheet metal blanking, shear is provided on punches and dies so that <b>Press load is reduced</b>
67.	Fullering is done in the forging operation is done to <b>Draw out the material</b>
68.	Gun barrels are done by <b>Deep hole drilling</b>
69.	An example of solid state joining process <b>Friction welding</b>
70.	The electrodes in resistance welding are generally made of <b>Copper alloys</b>
71.	In the following welding, use of mechanical energy is absent <b>Friction welding</b>
72.	In brazing, the flux does not <b>Reduce the fluidity of the filler metal</b>
73.	The range of compression ratios in compression ignition engines <b>12 – 24</b>
74.	The essential ingredients for combustion to take place in SI engine <b>Combustible fuel and air mixture and source of ignition</b>
75.	The fuel ignition quality of SI engine fuel is measured in terms of <b>Octane number</b>
76.	In a 4-stroke cycle engine, the ratio of camshaft speed to crankshaft speed is <b>1:2</b>
77.	The following is correct for CI engine <b>Abnormal combustion happens in the early stage</b>
78.	Supercharging is beneficial for following type engines

	<b>Compression Ignition engines</b>
79.	Stoichiometric combustion of hydrocarbon fuel and air leads to <b>Complete combustion products</b>
80.	By employing high Octane number fuels will enable <b>Longer ignition delay</b>
81.	The location of fuel jet in a simple carburettor <b>In the throat portion of venturi of carburettor</b>
82.	High pressure fuel injection into the combustion chamber of ----- engines is necessary <b>Compression ignition engines</b>
83.	In a laboratory, the engine power is measured using <b>Engine dynamometer</b>
84.	Normally the thermal efficiency of compression ignition engines lies <b>20 - 45%</b>
85.	The following vapour power cycle is the basis for practical steam power plants <b>Rankine cycle</b>
86.	Equivalent evaporation of water is applicable for <b>Boilers</b>
87.	The dryness fraction of steam is maintained high in the later stages of expansion due to <b>Reduction in moisture content and protect turbine blades</b>
88.	Super thermal power stations employ-----type of boilers <b>Once through or supercritical boilers</b>
89.	The phenomena of surging is present in <b>Centrifugal compressors</b>
90.	According to Fourier law of heat conduction, the rate of heat transfer is <b>Directly proportional to area of heat transfer</b>
91.	The thermal diffusivity is ratio of <b>Thermal conductivity to heat capacity</b>
92.	In transient heat conduction, lumped system analysis is applied when <b>More than 1.0</b>
93.	The significance of critical insulation is <b>A limit on the thickness of insulation</b>
94.	In unsteady heat conduction, the following non-dimensional numbers are involved <b>Fourier number and Biot number</b>
95.	The condition for Fully developed laminar internal flows <b>The velocity profile will attain parabolic shape</b>
96.	If Prandtl number is unity <b>The thickness of thermal boundary layer is equal to hydrodynamic boundary layer</b>
97.	The ratio of emissive power of a surface at a given temperature and radiation from a black body at the same given temperature is <b>Emissivity</b>
98.	In the design of heat exchangers, the concept of -----is used <b>Logarithmic Mean Temperature Difference</b>
99.	When the complete information on temperatures of two heat exchanging fluids is unknown-----concept is used <b>Number of transfer units(NTU)</b>
100.	Adiabatic saturation process of air <b>The enthalpy remains constant</b>

101.	In vapour compression refrigeration system, the throttling process takes place in <b>Capillary tube</b>
102.	A journal of 120 mm diameter rotates in a bearing at a speed of 1000 rpm. What is the power lost during friction if 8 kN radial load acts on the journal and coefficient of friction is $2.525 \times 10^{-3}$ ? <b>0.126 kW</b>
103.	A V-belt pulley has belt velocity 20 m/s and mass 0.7 kg per meter. If allowable tension in the belt is 600 N then what will be the power transmitting capacity of belt? Assume $\mu = 0.5$ & $\theta = 2.5$ rad) <b>4.5 kW</b>
104.	What is the axial force acting on a worm gear for a worm gear pair 1/40/9.5/10, if tangential and axial force of 6213 N and 9236 N act respectively on the worm? $\Phi_n = 25^\circ$ & $\mu = 0.04$ ) <b>6213 N</b>
105.	What is the shortest distance between worm gear and axes of the worm for a worm gear pair designated as 2/40/10/8? <b>200 mm</b>
106.	A flat belt transmits power of 20 kW when the velocity of the belt is 30 m/s. What will be the initial tension in the belt if 230 N is the centrifugal tension in the belt and $F_1 / F_2 = 2.5$ ? <b>1007.77 N</b>
107.	Two pulleys of an open belt drive A and B transmit power of 100 kW from pulley A running at 1000 r.p.m to pulley B at 500 r.p.m. If diameter of pulley A is 150 mm and 3% is the slip at operating conditions then what is the diameter of pulley B? Assume thickness of belt = 12 mm) <b>302.28 mm</b>
108.	The expected rating life of roller bearings rotating at 1000 r.p.m. is 30000 hours and equivalent dynamic load of 4000 N acts on it. What is the basic dynamic capacity of the bearing? <b>37900.22 N</b>
109.	If the plates are to be designed to avoid tearing failure, the maximum permissible load P in kN is <b>167</b>
110.	Anti friction bearings are <b>Ball and roller bearings</b>
111.	In a journal bearing, the radius of the friction circle increases with the increase in <b>Radius of the journal</b>
112.	The shock absorbing capacity of the bolt can be increased by <b>making the shank equal to the core diameter</b>
113.	The example of an open pair is <b>Cam and follower</b>
114.	As per Gruebler's equation, the number of degrees of freedom (F), for a mechanism which has n number of links(including fixed links) and $f_1$ number of pins or revolute pairs or pairs

	that permit one degree of freedom <b><math>F=3n-1-2f_1</math></b>
115.	The dog clutch is used? <b>to connect and disconnect machine parts</b>
116.	The total number of instantaneous centres for a mechanism consisting of “n” links is <b><math>n(n-1)/2</math></b>
117.	The number of instantaneous centres of rotation for a 6-link mechanism? <b>15</b>
118.	The interference will not occur if <b>Addendum of pinion is greater than that of gear</b>
119.	_____ is an inversion of Double slider crank chain. <b>Scotch yoke mechanism</b>
120.	Whirling speed of the shaft is the speed at which <b>shaft tends to vibrate vigorously in transverse direction</b>
121.	A pulley and belt in a belt drive form a <b>turning pair</b>
122.	The balancing weights are introduced in planes parallel to the plane of rotation of the disturbing mass. To obtain complete dynamic balance, the minimum number of balancing weights to be introduced in different planes is <b>2</b>
123.	Minimum number of teeth for involute rack and pinion arrangement for pressure angle of 20° is <b>1. 18</b>
124.	Two springs have spring stiffness of 1500 N/m and 2000 N/m respectively. If they are connected in series, what is the spring stiffness if they are replaced by an equivalent system. <b>857.63 N/m</b>
125.	Which type of vibrations are also known as transient vibrations? <b>Damped vibrations</b>
126.	Which among the following is the fundamental equation of S.H.M.? <b><math>x + \omega^2 x = 0</math></b>
127.	Calculate natural frequency of damped vibration, if damping factor is 0.52 and natural frequency of the system is 30 rad/sec which consists of machine supported on springs and dashpots. <b>25.62 rad/sec</b>
128.	The following statement is/are true for coulomb damping?  a. Coulomb damping occurs due to friction between two lubricated surfaces b. Damping force is opposite to the direction of motion of vibrating body c. For smooth surfaces, coefficient of friction depends upon velocity d. Damping force depends upon the rubbing velocity between two rubbing surfaces  <b>Only statement b</b>
129.	Eddy current damping is an example of _____ <b>Viscous damping</b>

130.	In the following type of chips, the chips adhere to cutting tool <b>In built-up edge chips</b>
131.	The tool life equation proposed by Taylor is, parameters with usual notations $V/T^n = C$
132.	The distance between live centre and dead centre of a lathe machine signify <b>Length of work piece can be accommodated</b>
133.	Following are the qualities of cutting fluids are <b>High thermal conductivity , low viscosity</b>
134.	The best accuracy of the hole made in the following <b>Reaming</b>
135.	A ring gauge is used to measure <b>Outside diameter but not roundness</b>
136.	Steel balls are manufactured by..... <b>Cold heating</b>
137.	The following motor is not used in axis or spindle drives of CNC machine tools <b>Induction motor</b>
138.	The machine tool, in which calculation and setting of the operating conditions like depth of cut, feed, speed are done during the machining by the control system itself, is called <b>Direct Numerical Control System</b>
139.	Coordinate measuring machine is an example of <b>Surface roughness measuring machines.</b>
140.	Which of the following code will give point to point movement? <b>G00</b>
141.	Break-even analysis consists of <b>fixed and variable costs</b>
142.	The meaning of balance delay in an assembly line <b>100-line efficiency %)</b>
143.	If economic order quantity is equal to order quantity, the ordering cost is equal to <b>zero</b>
144.	A graphical device used to determine the break-even point and profit potential under varying conditions of output and costs, is known as <b>Break-even chart</b>
145.	The following is the another name for Just-In-Time (JIT) production <b>Lean production</b>
146.	Kanban system is related to <b>Just-In-Time production</b>
147.	FSN Analysis means <b>Fast, Slow-moving and non-moving items</b>
148.	In ABC analysis, the Pareto principle was generalized by <b>Joseph M. Juran</b>
149.	The stock kept between two machines with different product rates <b>Decoupling inventory</b>
150.	PERT and CPM <b>do not require a chronological relationship among activities.</b>